

THE CONCEPT OF COLLECTION FROM THE USER'S PERSPECTIVE

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This study explores the concept and functions of collection from the perspective of the user. In-depth interviews with ten professors from a social science discipline and a natural science department provided descriptions of their information seeking involving material sources and their perceptions of the library collection. Participants used the following parameters in perceiving the library collection: instant availability, selectivity, physical collocation, catalog representation, user privilege, material stability, and further parameters for subcollections, including subject and format. Additional components that were important in the users' information environment were personal collections, the Internet, and other institutions' collections. Analysis revealed that collections provided valuable functions, such as collocating sources for convenience and saving time and money, selectivity, narrowing the search scope to increase precision and ease of use, presenting choices, and assisting in clarification of information need. The user's perspective demonstrates the need for user-centered and flexible, rather than library-centered and fixed, collection structures.

In library and information science (LIS), the concept of collection has no rigorous definition and represents many different entities that are often seen from a library management perspective rather than from the perspective of users. Further, since collections have long been associated with the physical library, it is uncertain how the concept of a collection can be expanded in the virtual world. The purpose of this study was to begin an exploration of what constitutes a collection, to the library user, in the current information environment, where information is increasingly made available digitally. The study explored the following issues: (1) How do users perceive collections, including the one provided by the library? What explicit and implicit parameters do they use in perceiving collections? Are

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these parameters the same as the ones understood by librarians? (2) Do collections play a significant role in information seeking? If they do, what are their major functions in information seeking? The results show that taking a user-centered approach to the concept of collection can help overcome some of the challenges faced by the concept and its various definitions.

I. Collections in LIS Research

A review of LIS research disclosed a significant gap with regard to conceptual and functional issues about collections. While collections continue to be developed in the physical world and in the virtual environment, their role in information seeking—and their relationships with each other—have not been examined systematically, especially from the users' perspective.

In collection development, managerial and technical aspects have dominated the field. Traditional issues included assessment of user needs in terms of topic, language, timeliness, and resource type; collection policy; selection of materials based on quality, relevance, and cost; weeding; and budgeting (e.g., [1–4]). More recently, library collection developers and managers expanded their discussions to include technological advances such as digitization of print collections [5–6]. At the same time, a new species of collection developers, predominantly computer scientists who had no association with libraries, were using advanced technology to find ways to develop digital collections automatically [7–8]. In evaluating the library collection, researchers either tabulated the use frequencies by type of information resource and by individual item (e.g., [9]) or measured the success and failure of the library collection in meeting users' information needs in terms of accessibility and availability (e.g., [10]).

This body of research on collections looked at a collection, or collections, from the point of view of the information agency and considered the use of collections to be unidirectional. The dynamic nature of the interaction between the user and the collection was somehow overlooked. The same view was also reflected in a philosophical discussion of the value of library collections by Michael Buckland, which stipulated four major roles for collections [11]: (1) preservation, preserving documents for current and future use; (2) dispensing, providing convenient access to documents; (3) bibliographic, assisting in identifying and locating documents; (4) symbolic, bringing status and prestige to the institution. These roles did not appear to consider the active involvement of users. As I suggested in an earlier article, the collection, by presenting the information in stock, frequently acts as an advisor to assist the user in clarifying or modifying the information need during individual information episodes [12]. Collection

use, in other words, is interactive, and the user is an active agent. Unlike the first four roles, the collection's advisory role emerges in the interaction between the user and the collection, and it becomes observable only during information seeking.

Recent research on information seeking and use has most often taken the user-centered approach to examine users' behavioral patterns and their preferences for particular types of information resources under various conditions or in various settings (e.g., [13–17]). On the surface, collections and collection structures (i.e., components and the organization among the components) did not seem to be a significant consideration in this research. A closer look, however, revealed that some research findings had alluded to the usefulness of collections in information seeking, especially in one particular type of information seeking, purposeful browsing. Authors sometimes referred to a collection as a “database” and subcollections as a “series of books,” “areas in the library,” or “levels of detail in a database” [18]. They often suggested that better organization of collections “make most browsing strategies much easier” [19, p. 120].

Research on interdisciplinary information seeking and use has been used to point out inadequacies of the library collection. One such study reported that citations from the publications of a disciplinary faculty were not limited to the articles from journals in that particular discipline [20]. The author then suggested that the findings supported the argument against the establishment of departmental branch library collections by narrowly defined disciplines. Her assumption was that this group of users preferred an interdisciplinary science collection rather than a disciplinary one, regardless of the users' situation or the topic they had in hand. This assumption appears to have been based on one librarian's opinion, rather than on a systematic examination of users' needs or behavior.

The foregoing studies clearly show that we do not yet understand how collections help users in their information seeking. This gap makes it difficult for information professionals to organize documents into well-designed and well-connected collections and subcollections that will facilitate information seeking. The study reported here is a first attempt to uncover users' perceptions of the concept of collection when they seek information.

II. Research Methods

This study explored how a particular group of users perceived collections and the functions of these collections in their work. Since the user's perspective was its main concern, the study took a grounded theory approach and let users convey their perception of collections in their interactions

with all information resources rather than only the resources provided by the library. To gain further insights, these perceptions were then compared to those of the librarians at the same institution. It was hypothesized that there are differences between the two perspectives because the user's perspective emerges during information seeking and use and the librarian's perspective emerges in management.

The study site chosen was a Midwestern public research university in the United States. This university has only one physical library building, located in the center of campus. By the end of 2000, the library had nearly 5 million cataloged items. Like many other academic libraries in the United States in recent years, it has considerably increased its online information resources to include the online catalog, a host of online databases, and electronic books and journals as well. Its home page on the Web serves as a gateway, which provides a single point of electronic access to library resources and services. Again, like many other U.S. academic libraries of its size, this library has no subject bibliographers on staff, and the faculty shares the responsibility for developing the collection.

As an in-depth exploration into users' various perceptions and experiences, the study employed a purposive sample of ten university professors [21]. The goal in selecting the participants was to include some diversity so that a small number of participants would provide a reasonable range of opinions and experiences. Since there was no intention to generalize the findings, the diversity of participants was considered rather than the representative composition of the sample. In selecting participants, several factors were considered: discipline, academic rank, gender, and ethnic background. In the sample, two disciplines (a natural science and a social science) were considered, as were all three academic ranks, both genders, and four ethnic groups (i.e., African American, Asian, Caucasian, and Hispanic). Participation in the study was voluntary. Three additional natural scientists (who were contacted initially) either declined or failed to respond to the request for an interview.

The data collection method was the semistructured, long interview. Individual interviews lasted between forty and seventy minutes. Each user interview was conducted in the participant's office. During the interview, each user participant talked about the library collection and other collections he or she had used and the significance of these collections to his or her work. At the beginning of each interview, the participant was asked to describe the separate ways he or she sought information for teaching, as compared to research: where he or she began, what resources he or she used, how he or she located particular documents, what major problems he or she encountered, and how he or she solved these problems. The descriptions of the participants' overall information seeking, although

not the focus of the study, provided useful data about their behavioral patterns, which helped supplement their articulated perceptions.

The investigator also interviewed five librarians from the same institution who worked in different units within the library and had varying degrees of collection development responsibility and varying lengths of professional experience. The interviews of the librarians were conducted in their offices or in one of the library's conference rooms. The librarians first named the types of information resources that they thought the library offered and then described and explained how these resources fit into the library collection. As the interview continued, they also commented on additional types of library information resources not mentioned at first. Other questions included, how did they view the relationship between the university library collection, collections of other institutions, and the resources of the Internet, and what was the importance of the library collection for users?

All interviews were tape-recorded. Transcripts of the audiotapes and the notes taken by the researcher during the interviews provided the basis for data analysis. The Web pages of the library and the university supplied additional background information and were especially useful during the initial stage of sampling.

III. The Library Collection

For the purpose of this study, the total aggregate of all documents provided by the library is termed the "library collection," and part of this collection is considered a "subcollection." The study's findings revealed that the library collection was a major source of information for all the user participants, with or without their knowledge. Information resources outside the library collection were also important. The following discussion of the findings is organized into three separate sections: first, the library collection; second, other document sources (other collections); and third, challenging questions on the traditional model of collections.

A. Users' Collection Parameters

As an entity, the library collection seemed to be extremely vague in the users' minds. When asked about the collection, some user participants replied in a manner that appeared to equate it with a group of physical items housed in the library building. Many were unable to explain what it was that they perceived as the library collection (e.g., in trying to describe the collection, one user participant said, "I guess it would really be the books in the library and the extended collections you can . . . , you know,

our databases that are accessible, that are relevant to my area"). Nevertheless, the data from the interviews did identify a number of parameters that were, in one way or another, influential in the users' perceptions of the library collection. Because of the users' vague ideas about the collection, these parameters were rather implicit and indirect in their statements. The following are the parameters, presented in no particular order.

Instant availability emerged as one significant collection parameter. Many of the user participants were convinced that the library collection must be "readily available" and that if something were not readily available, it could not be considered part of the collection. For example, when they were asked whether they would use all the materials in the entire state university system as one collection if the libraries of all state universities formed a consortium and users on all campuses could check out materials in the system directly online, the participants replied negatively because materials that were on other campuses were not readily available, and there would still be a waiting period, no matter how short. However, this particular concept of availability was not consistently applied, since a document belonging to the library, but temporarily out on loan, was considered part of the collection even though it was not readily available at the time of the request. On the other hand, a readily available Web page was not considered part of the library collection even if it were linked to the library's Web site. Obviously, other factors were in force.

In general, users said selectivity was an important parameter for separating the library collection from the rest of the world. Materials were included in the library collection by librarians because they supposedly met the criteria of quality and relevance for users. One user from natural sciences complimented the library for having selected a group of materials so useful that he was spared the task of searching through a large quantity of irrelevant and substandard sources since the latter had already been excluded from the library collection. Other participants agreed that selectivity was crucial, but they criticized the library collection for lacking selectivity. According to them, the collection's lack of selectivity added a burden to their work and impeded their performance because they had to engage in more prolonged information seeking and suffered frequent delay and/or failure to get needed information.

Physical collocation created by the library building was an obvious parameter for two of the users, a social scientist and a natural scientist. Before the advent of the Internet, the library collection had existed only within the walls of the library, and this impression of a physical collection had persisted. One of these users implied that this physical collection had become insignificant as far as his work was concerned. He also criticized his hometown public library's plan to expand its library building, and he insisted that the collection (i.e., the physical one) should remain small so

that the available money could be spent to connect the entire town to a central computer server to provide all residents with electronic access to information.

Some of the users understood that the collection was a result of resource management. Thus, "management" seemed to present two other parameters for defining the library collection: catalog representation and user privilege. These parameters, however, were more implicit in the users' descriptions of their interactions with information resources. For instance, all users said that they used the library catalog to determine whether a document (e.g., a book or a journal) was in the library collection. They seemed to assume that the library collection was represented in the catalog and that the catalog delimited the boundaries of the collection. User privilege was brought up by a participant who was keenly aware of the fact that many databases were only available to him through an arrangement made by the library with vendors. In other words, the establishment of the collection served the additional purpose of access control by allowing use of the collection only to those with access privileges—the faculty and students of the university.

Yet another parameter implied by a user was the stability of the material. She rejected the idea of including freely accessible Web pages as part of the library collection, even if they were linked from the library's home page, because the permanency of Web pages was questionable, their contents could change any time or soon become outdated, and their volume was so enormous that "it would be incredibly difficult [for the library] to maintain." Although traditional library materials shared some of these problems, it is possible that the overall instability of Web pages prompted her to single them out. The instability of Web pages could also explain why the immediate availability of Web pages was not enough reason for some users to consider them part of the library collection.

Within the library collection, the user participants saw subcollections. The two most obvious parameters by which they conceptualized subcollections were two categories of collocation: subject and format. A social scientist, for instance, explained that, for her, a disciplinary subcollection was what came to mind when she heard the word "collection," and, in fact, this subcollection only occupied several shelves of books and periodicals in the library stacks, without the separation of a physically distinguishable room or building. She also saw the library's subcollection on the local metropolis as a further example of a subject collection. Another user pointed out that it was desirable to have virtual subject subcollections to satisfy certain information needs. Moreover, a scientist reported that he routinely added a couple of keywords to his searches in an online database so that the retrieved documents would be limited to a particular subfield. Although not directly stated by this user, his search strategy suggested a

TABLE 1
COMPARISON OF CHARACTERISTICS USED BY THE USER PARTICIPANTS AND THE
LIBRARIANS TO CONCEPTUALIZE THE LIBRARY COLLECTION

	Users' Collection Parameters	Librarians' Collection Parameters
Instant availability	Yes	No
Selectivity	Yes	Yes
Physical collocation	Yes	No
Catalog representation	Yes	Yes
User privilege	Yes	Yes
Stability of the material	Yes	Material permanency
Proprietary ownership	No	Yes
Direct oversight	No	Yes

desire for collocation by subdiscipline. The last characteristic for collocation mentioned repeatedly by the users was format, such as journals, books, and indexing and abstracting databases.

The study confirmed the findings of a previous study by David Ellis, Deborah Cox, and Katherine Hall that there was homogeneity between the information-seeking patterns of natural scientists and social scientists [13]. Although not a study of general information seeking, the comparison of the two groups of users in this study revealed similarities rather than differences in their perceptions and use of the library collection. For a summary of users' collection and subcollection parameters, see the left column in tables 1 and 2.

B. Comparison of User and Librarian Perspectives

An earlier paper [22] has summarized librarians' perceptions of the library collection and subcollections (based on this study's data) and enumerated

TABLE 2
COMPARISON OF CHARACTERISTICS USED BY THE USER PARTICI-
PANTS AND THE LIBRARIANS TO CONCEPTUALIZE SUBCOLLECTIONS

	Users' Subcollection Parameters	Librarians' Subcollection Parameters
Collocation:		
Subject	Yes	Yes
Format	Yes	Yes
Publication origin	No	Yes
Special value	No	Yes
Purpose	No	Yes
Lack of special characteristics	No	Yes

seven criteria used by the participating librarians to conceptualize collections (see tables 1 and 2). The librarians were not unanimous on all seven criteria, and some of these criteria could be contradictory to each other.

Criterion 1. Catalog representation: the library catalog should fully represent the entire collection, but because of limited resources, priorities should be set for which types of materials would be cataloged first.

Criterion 2. Proprietary ownership: the collection contained only those materials to which the library could claim proprietary ownership through purchasing or some kind of contractual relationship. In other words, a free Web site accessed by a link from the library's Web site was not considered part of the library collection because the library could not claim proprietary ownership.

Criteria 3 and 4. User privilege and direct oversight: materials owned by individual libraries in a consortium could qualify as a collection if all libraries within the consortium received their funds from the same source and had mutual agreements on universal borrowing and direct oversight over system-wide collection development.

Criterion 5. Subject: subject was used to conceptualize a subcollection *only* when the library designated a physical area (e.g., a room) for this arrangement.

Criterion 6. Selectivity: only the resources selected by the university's librarians were considered part of the collection.

Criterion 7. Material permanency: some materials were not quite accepted as part of the collection because they were ephemeral or because their permanency was in question. This criterion was more implicit in the data and manifested in the librarians' decision to not catalog some materials, which resulted in the lack of representation for these materials in the catalog.

Since several of the above criteria were rather implicit in the librarians' descriptions, all of them will be called "parameters" to be consistent with the parameters emerging from the users' perspective.

"Subject" was a parameter for conceptualizing subcollections by librarian participants. After reviewing the data, more implicit characteristics used by librarians for collocating subcollections were extracted: format (e.g., "a wonderful collection of foreign maps"), publication origin (e.g., "our government documents collection"), special value of documents (e.g., "our rare collection"), and purpose of documents (e.g., "the reference collection"). The term "the general collection" referred to circulating books and back issues of periodicals that lacked any special characteristic.

The other parameters (catalog representation, proprietary ownership, user privilege, direct oversight, selectivity, and material permanency) were

all related to managerial concepts important to librarians. Together, these managerial parameters pointed to control as a principal goal in library management. When the library was able to establish a high level of control over certain materials, the materials being controlled were considered to form the library collection. As a case in point, materials owned by the library were considered part of the library collection *if* they were the result of careful planning in collection development and of intentional selection by individual librarians who had determined whether the materials (1) served a predetermined user community, (2) were not ephemeral, and (3) were worthy of being represented by the catalog. The librarians treated something that could not be controlled by the library (e.g., a free Web site) as outside the collection.

Although the user participants agreed on the necessity of resource management and recognized the requirements for quality materials and sound organization, their perspective focused mostly on access and use. For instance, they often spoke about collocation by universal attributes such as material format and medium and also by user-defined characteristics that might vary according to individual needs during information seeking. In the users' thinking, subject subcollections were not limited to the ones designated by the library in separate rooms or areas. Instead, a few shelves of books and periodicals organized in the same class according to Library of Congress Classification (LCC) were thought of as a subject subcollection by the users. There was also evidence indicating that the users' ideas of subject subcollections were not uniform and included some that were defined by discipline, as well as others in much narrower subfields specifically relevant to an individual's research. To users, the subject subcollections were more than an abstract concept because they could be applied strategically to facilitate information seeking (further elaborated below).

The different perspectives between the two participant groups became more distinct when their ideas about the same parameter were compared. The librarians described selectivity as an act of control: a document (or a group of documents) is considered part of the library collection *only* after a librarian makes a conscious decision to include it. The users, however, presented the parameter of selectivity in a very different light: to them, the library collection should include only materials of high quality and high relevance for the users and exclude materials that do not meet the users' criteria of quality or relevance.

The parameters "instant availability," "proprietary ownership," and "direct oversight" gave additional support to the proposition that the user's perspective focuses on access, while the librarian's focus is on control. Even though a fundamental purpose for developing a local library collection was to make selected materials readily available, the librarians did not indicate that instant availability was a necessary parameter for conceptu-

alizing the library collection. One librarian went as far as accepting the idea that all the collected resources in a consortium could constitute *one* collection if members of the consortium could assert proprietary ownership and have direct oversight over the amalgamation of the resources (see criteria 3 and 4 above). However, when the users were asked about consortium arrangement and the various types of proprietary ownership by the library, they expressed their unfamiliarity with—and lack of interest in—these managerial issues. In the unanimous opinion of users, documents were *not* part of the library collection unless they were immediately available and did not require a waiting period, no matter how short. The implication seemed to be that the users, for their own convenience and efficiency, preferred immediate access to materials without delay, but the librarians, presumably working with operational constraints, sought to maximize the overall availability of materials.

Another parameter, physical collocation, which figured in users' perceptions of the library collection, was no longer accepted by the librarians as a defining parameter for the library collection. The librarians' view was understandable, since the library had provided virtual documents as part of its collection service for some years, and physical collocation had lost its usefulness in their work. One user who limited the library collection to the physical component disassociated online resources with the library because he accessed those resources through a Web home page designed for his research group, and he believed that his grant money (administered by the graduate school and not the library) paid for the online databases. He had concluded, therefore, that the library collection—the physical one in his mind—was irrelevant to his research.

C. Significance of the Library Collection

In describing their information seeking, the user participants were attentive to information resources in terms of format (e.g., a book), medium (e.g., an online database), search mechanism (e.g., the library catalog), credibility, availability, and a number of other attributes important to their work. On the surface, the structure of the library collection and its subcollections seemed to be of little significance in the users' perceptions. However, careful examination of their descriptions of information-seeking processes and preferences revealed interesting and undoubtedly critical roles and functions played by the library collection.

From the outset, nine of the ten user participants knew that the library collection offered a valuable service by pooling together many information resources and making them conveniently available. For some users, the library collection—especially its online indexing and abstracting databases—was the first place they began to seek information. Occasionally, the personal collection (i.e., journals, books, and other sources) in their

offices were first briefly consulted, but the library's databases still served as a primary source. The users reported that having this library collection saved them time and money. Time saving was obvious when the users had immediate access to the majority of information resources they needed and the resources were systematically organized for easy retrieval. Cost saving was also obvious. Two of the users mentioned that they could not afford the materials and looked to the library to provide them, especially the costly ones.

A factor closely related to time saving was the collection's selectivity. As one user pointed out, this "reasonably good collection of stuff" limited the scope of information and served most of his information needs, which saved him from having to spend time searching through the larger information environment. On the other hand, a few other users complained that the library did not have a good selection of journals and books in their areas. According to one, several journal titles in the collection were of poor quality and low use; he suggested that the library replace them with another high-quality journal that was more expensive than the others. The strong implication in their statements was that the users wanted a selective collection that had more relevant and useful documents and fewer irrelevant or substandard ones.

As demonstrated in users' descriptions of their information seeking, the library collection also played a bibliographic role by offering opportunities for identifying additional documents not found through searches in the library's online catalog. A common strategy applied to information seeking was to browse in the book stacks and, occasionally, in the periodical reading room. As one user said, "I'll often do that in the stacks over there in the library where I'll find a book, and then, I'll just look, you know, to the right and left of it, and I often find other really good stuff that somehow didn't turn up in my other searches." Users from both groups reported browsing activities in the book stacks, but browsing occurred less frequently in the periodical reading room. The natural scientist participants relied almost exclusively on a service that delivered tables of contents from a selected group of journals directly to them. They had also stopped visiting the periodical reading room and had their students do the legwork for them. Two social scientists, however, did mention browsing in the periodical reading room. This type of browsing largely occurred because books, as well as periodicals on the same or related subjects, were shelved together because of the LCC scheme applied.

Several users from both groups expressed their appreciation for having subdivided groups of resources within the library collection. One participant asserted that having databases that each covered different subject areas made it easier to explore each subject in depth without getting an overwhelming amount of irrelevant hits. Another participant indicated the

need for a structured setting with individual disciplinary databases because "if you just have everything available for me [at once], . . . because I'm not that literate on the computer, I would just feel lost." To increase the search precision rate, a third user suggested that there should be ways to further narrow down to subfields in a database. Although only involving subject collocation, their idea of having subcollections at various levels within the library collection to facilitate more effective, and less complicated, searching appeared to have far-reaching applications to other types of collocation, such as collocation by format and medium.

IV. Other Collections

In addition to the information resources provided by the library, the user participants talked about four other sources of documents: other libraries, vendors, a personal collection of print sources, and the Internet. The preferred contact with other libraries was through interlibrary loan arrangements. Only one user had used his grant money to order journal articles directly from vendors who would then fax articles to him within twenty-four hours. The personal collections consisted primarily of books, a few journals, several file drawers of article copies, and notes. Without exception, all the users had direct access to the Internet on their office computers, and the Internet had become a major source for information. None of the users accessed the free Internet sites through the library, nor did they think of this as a possibility. Interestingly, the majority of users were unable to distinguish between fee-based sites, that is, those paid for and managed by the library, and free Internet sites because they simply bookmarked links to both types of sites on their Internet browser without differentiating between them.

The personal collections and the Internet were additional evidence of collections' importance in information seeking. Every user participant had a personal collection. They bought a book or subscribed to a journal if they knew that they would use the material frequently and if it were affordable; occasionally, they even duplicated what the library already had. They also kept copies of journal articles in their file cabinets or on their computer (if the article came electronically). During library visits, they regularly checked out books and then placed the books in their personal collection temporarily, sometimes for an extended period of time. Besides convenience, these personal collections often served a critical advisory function by assisting the users in their exploration stage. One user described how he consulted his personal collection of books that were reviews of individual subareas in his field. Each of these reviews consisted of an overview and expert assessment of research development in one area that

was of great value to this participant in his initial exploration into unfamiliar territory. The knowledge and the terminology gained this way were useful in his further information seeking. Other users reported similar uses for their personal collections of books, especially when they were preparing for a new course.

The bookmark (or “favorites”) file on their computers stored another type of personal collection: URLs for the Internet sites that they wanted to consult frequently. A senior professor disliked the trouble of managing a bookmark file and instead had a Web page that provided integrated access to a small collection of Internet sites and electronic journals for his entire research team. These personalized collections and access mechanisms were intended for instant and convenient access—a requirement for the materials constantly needed by the users. The bibliographic and advisory functions of such a collection were an added benefit as well. The user participants frequently and regularly monitored several Web sites in their specific areas, usually by bookmarking them to quickly access the most current information (i.e., the bibliographic function). They also reported that they sometimes went to these Web sites for information that might help them explore unfamiliar concepts, issues, and questions (i.e., the advisory function). These activities involving bookmarked Web sites seemed to have partly replaced the physical browsing in the library stacks.

V. Traditional Collection Model Questioned

The study’s findings illustrated a user perspective with marked differences from that of the librarians, despite some commonalities between the two. The differences reflected the focal concerns of the two groups. The librarians’ perspective was that of management, and its emphasis was on control. The users’ perspective was one of access, and its emphasis was on personal convenience and flexibility. This tension between the two perspectives has serious implications for future research and system design, described as follows.

A. *Library-Centered or User-Centered*

The ten professors participating in the study reported that the primary location for their information activities was the office, rather than the library. Eight of the ten admitted that they rarely visited the physical library any longer. The other two visited the library a little more often because they felt their computer skills were deficient, but, in their offices, too, online searching was slowly taking over as their major information-seeking activity. The information retrieval tools available in private offices (i.e., the computer, the Internet connection, and the fax machine), and the instant

availability of many resources on the Internet, made it difficult for the participants to discern where the library stopped and the outside world began. At times, they did not associate some of the fee-based online resources with the library because access to these resources was through the bookmarks on their own Internet browser—and the issue was of no particular concern to them. What they *were* interested in was how to maximize the amount of quality information they could retrieve directly in their personal space and how to make the process of information retrieval most effective.

The online resources combined with the user's personal collection of printed materials created a very complex information environment in a user's personal space. As a result, the user participants viewed the personal space as a universe of its own, and this universe became the center of the user's information seeking. A library collection-centered approach to information organization was clearly at odds with these users. For example, the library cataloged some online resources and created other finding aids (such as two alphabetical lists, one for electronic journals and the other for other online resources) and a discipline-based subject directory of major reference tools. The users, however, bypassed these library tools and used the bookmark function on the Internet browser to directly access a few of the online resources to which the library subscribed.

The bookmark file each user had compiled on the browser, as well as the home page for a research group, served as an ad hoc organizational tool for the user's most frequently needed online resources from the library and from the at-large Internet. In other words, these users created their own personalized online collections for speedy access; such self-developed collections suggested that the users preferred collection structures that centered on their individual needs.

B. Fixed or Flexible

As indicated above, some user participants considered collection and subcollection structures useful for more effective information retrieval. These structures, however, sometimes became barriers in information seeking because they were created by information providers and could not be modified to meet individual needs. This has been especially true in the physical environment where collection and subcollection structures are, to a large degree, fixed. Even online sources often have limited flexibility. The descriptions of the users' information-seeking patterns in this study suggested a need for a much more flexible collection arrangement that could be customized to suit individual needs.

First of all, the user participants reported that they sometimes wanted the ability to conduct a single search in a comprehensive system to save time. Without an integrated search mechanism to access various infor-

mation sources, their searches were inconvenient and time-consuming. Second, being able to narrow searches in a smaller scope (e.g., a disciplinary or subdisciplinary collection) was highly desirable when the users wanted to achieve a higher precision rate in searching or when the users perceived themselves to be inexperienced searchers. Third, a social scientist participant who was an interdisciplinary researcher expressed a wish for the ability to simultaneously search several subdisciplinary collections of the library (e.g., the nursing and sociology subcollections). She also mentioned the need for collocating interdisciplinary materials based on locally sensitive themes—one example given was the library's local history subcollection.

Obviously, a fixed collection structure will not meet all three of the above requirements at the same time, especially when the user's personal collection and other outside sources are also part of the picture. What is required is a well-designed structure that also has the flexibility to allow the user to navigate and temporarily reconfigure the structure according to individual needs. Research has been done in this direction to increase system interoperability in the online environment—an unthinkable approach in the physical world. A few database vendors also offer the feature of searching multiple databases simultaneously. Nevertheless, two existing problems have become stumbling blocks. That is, users currently lack integrated access to all information sources encountered in their overall information environment. The participants in this study reported many tools used in information seeking, including those created haphazardly by themselves to organize and access their personal collections (e.g., a typed bibliography of article copies in their files) and online resources (e.g., a bookmark or "favorites" file). In addition, collection and subcollection parameters in information systems are inadequate to meet users' needs. Two advanced features were specifically on the wish list of this study's participants: the ability to create temporary collections of databases across vendor platforms and to combine subject subcollections in any database (including the library catalog) as the situation requires.

VI. Discussion and Conclusions

Although the findings of this study cannot be generalized, they suggest several issues important to the academic user that have significant implications for improving system effectiveness: (1) a well-designed collection structure enhances information organization and facilitates information seeking; (2) to achieve a well-designed collection structure, collection parameters required by both users and system managers must be included, and relationships between collections and subcollections must be articu-

lated; (3) this collection structure should integrate all information resources, not simply library materials, and take a user-centered approach; and (4) as academics increasingly prefer online and instant access, the information system must take advantage of advanced technology to offer enhanced flexibility in view of user requirements so that the user will be able to customize the collection structure to meet individual needs.

Librarians have had their own views and beliefs about what users think about libraries and collections, and the findings of this study probably agree with some of these views and beliefs. While one of the purposes of a systematic inquiry is to verify (either confirm or reject) what we know, the results of this study, emerging from the user participants' descriptions of their perceptions of collections and their interactions with information sources, point to new ways of looking at collections when designing information systems. These users' perspectives focus on the functions of collections instead of on managerial or technical aspects of collections and collection development, and this, in turn, expands our knowledge about collections beyond a simplistic definition.

The library's online catalog can be used as an example to illustrate the potential usefulness of this study's findings. In its current state, the catalog already includes many parameters for structuring the library collection into subgroups (e.g., format, language, and publication date). The users in this study expressed a strong desire to have "discipline" and "subdiscipline" as additional parameters so that they would be able to limit their searches in specific disciplinary and subdisciplinary subcollections. Users who conduct interdisciplinary research also wanted the capability to combine two or more disciplinary subcollections in each search. As a first step toward addressing these needs in the online catalog, the library could utilize the definitions of disciplinary collections specified in collection management tools such as the *WLN Conspectus* [23]. Because the *Conspectus* method requires a classified collection to be in place before it can work, the library must apply a classification scheme, such as the LCC, to digital documents so that users are able to search digital collections in the same manner as physical collections.

More research is needed to extend the preliminary understanding and insight gained in this study. It is important to investigate user populations in different disciplines (e.g., the humanities, engineering, and medical sciences), institutions (e.g., multilibrary campuses), or settings (e.g., school media centers, public libraries, and corporate information centers) to reinforce what has been learned in this study and cast new light on the related issues. The above parameters for conceptualizing and structuring collections from the user's perspective (tables 1 and 2) also need further examination. The specific requirements that various types of users use to determine selectivity should be explored in depth. For instance, under-

graduate students usually need documents that are introductory in nature, and a collection developed for professors will not meet students' selectivity criteria, and vice versa. Moreover, future user studies may generate other useful collection parameters and assist in articulating relationships among collections across various levels. Other research methods, such as observation of searching activities, may supply additional parameters that are less evident to users and, therefore, missing from users' own descriptions of their information seeking.

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