The future of reference II

A *panel discussion held at the University of Texas at Austin, Spring 1989.*

A second program on the future of reference, "A Paradigm of Academic Library Organization," was held at the University of Texas at Austin General Libraries during the Spring of 1989. Where the first program (see *C&RL News*, October 1988, pp. 578–89) looked at the need for the reference desk and its associated procedures, the second program expanded this examination of reference services to include an entirely new paradigm, or model, of service.

The program was sponsored by the General Library's Reference and Information Services Committee. The attendees included academic librarians and administrators from the General Libraries and the Tarlton Law Library, librarians from the central Texas area, library school faculty and students, paraprofessionals, and general faculty and students.

The keynote address was given by Francis Miksa, professor, Graduate School of Library and Information Science. His remarks were followed by responses from Lynne Brody, head librarian of the Undergraduate Library, and Cheryl Knott Malone, reference librarian, Perry-Castañeda Library Reference Services Department, both at the University of Texas at Austin. Their presentations were followed by a discussion between members of the audience and the panel that continued well past the scheduled end of the session. The three addresses and a summary of the audience's comments by William Kopplin, 1988/89 chair of the Reference and Information Services Committee, are presented here.

The future of reference II: A paradigm of academic library organization

By Francis Miksa

Professor, Graduate School of Library and Information Science
University of Texas at Austin

My purpose here is to comment on the future of the academic research library. In making these comments, I will assume what almost no one will deny, that libraries in general and academic research libraries in particular are going through a period of significant change. In this light, my task will be twofold—first, to characterize the change that is taking place; and second, to explore implica-

tions of that change for the future.[1]

Scores of pronouncements and analyses have been made concerning changes taking place in our field. Some have been friendly and sensitive toward libraries, some hostile. Many have tended to focus on only one or another of the environments in which libraries operate on, for example, their technological environment or on their political or economic environments. Many have also concluded that the ultimate cause of the changes is the post-World War II advent of the information era.

All such pronouncements and analyses contribute to what has been a lively debate about the nature of the library's work, but in my opinion they have not gone far enough. I see change taking place in our field at a far more substantive level than most such analyses have suggested, at the level of what may be called the operational paradigm of our work. A paradigm is a pattern, especially a typical pattern, of behavior and relationships. Thomas Kuhn popularized the term by applying it to the way scientific discovery and advance is accomplished.[2] Here, I will apply it to the way libraries operate and, especially, to the basic assumptions that librarians bring to their work and which shape their activities. It is at this level that libraries in general, and academic research libraries in particular, are experiencing significant change.

The library paradigm

The paradigm or pattern that informs the work of academic research libraries can be ascertained by examining definitions of the term "library." At the core of all such definitions is the existence of a collection. A library is first and foremost a collection of the graphic records, knowledge records, documents (or whatever we may choose to call the things collected) of humankind. Of course, a library is not just any kind of collection; bookstores, for example, or a secretary's filing cabinet, are also collections of similar kinds of things. Thus, other requirements are ordinarily added to the basic idea in order to clarify the definition.

For example, the *Encyclopedia Britannica* states that a library is "a collection of books gathered for purposes of reading, study or reference."[3] Here, the nature of the use of the collection is emphasized but little else. Johnson and Harris go somewhat further. In attempting to distinguish the library from other kinds of collections, they define a library as "a collection of graphic materials arranged for relatively easy use, cared for by an individual or individuals familiar with that arrangement, and available for use by at least a limited number of persons."[4]

Here, the idea of organizing the collection so as to facilitate its use comes out strongly, as does the idea of managing the collection by a specialized staff. But the nature of the use is only implied—one supposes repeated use, not use where the supply of documents dwindles with purchase as in a bookstore—and users are described only in a vague numerical sense. Finally, the *ALA Glossary* states that a library is "a collection of materials organized to provide physical, bibliographic, and intellectual access to a target group, with a staff trained to provide services and programs related to the information needs of the target group."[5]

Here, stress is laid on all of the elements spoken of so far—on the collection, including its organization, use, and users (now a rationalized "target group"), and on the existence and role of a trained staff.

Regardless of how these definitions vary, the central point in each remains the same. A library, if anything, is a collection. If there is no collection, there is no library. This assumption is fundamental to the paradigm and leads us to abstractly portray it as displayed in Figure 1.

Viewing the paradigm as first of all a collection is important because it zeros in on the point where librarians typically begin their considerations about what work is to be done. The collection serves as a focus point, a central beginning point. All else, although not unimportant, simply follows from it; all else is derivative; all else is peripheral.

The collection as the focus, the beginning point in mentally patterning one's work, is so powerful

[1]Change may be viewed on more than one level. One may, for example, speak of it as a series of specific changes regarding policies, actions, etc. adopted by social institutions at various times and places. One may also speak of it as I attempt to do here as a change at the level of beliefs and assumptions where the essence of one's view of the purpose and nature of the institution is at stake. This level of analysis is obviously more subjective. It is related to and must be based on an appreciation of specific real-world changes but requires identifying essential patterns of a profession's self-view that underlie the more specific.

[2]Thomas S. Kuhn, *Structure of Scientific Revolutions*, 2d ed. Foundations of the Unity of Science series, vol. 2, no. 2 (Chicago: University of Chicago, Phoenix Books, 1970).

[3]*Encyclopedia Britannica*, 15th ed. ("Macropedia") s.v. "Library."

[4]Elmer D. Johnson and Michael H. Harris, *History of Libraries in the Western World*, 3rd ed. (Metuchen, N.J.: Scarecrow Press, 1976), 3.

[5]*The ALA Glossary of Library and Information Science*, edited by Heartsill Young (Chicago: American Library Association, 1983), s.v. "Library" (definition 1).
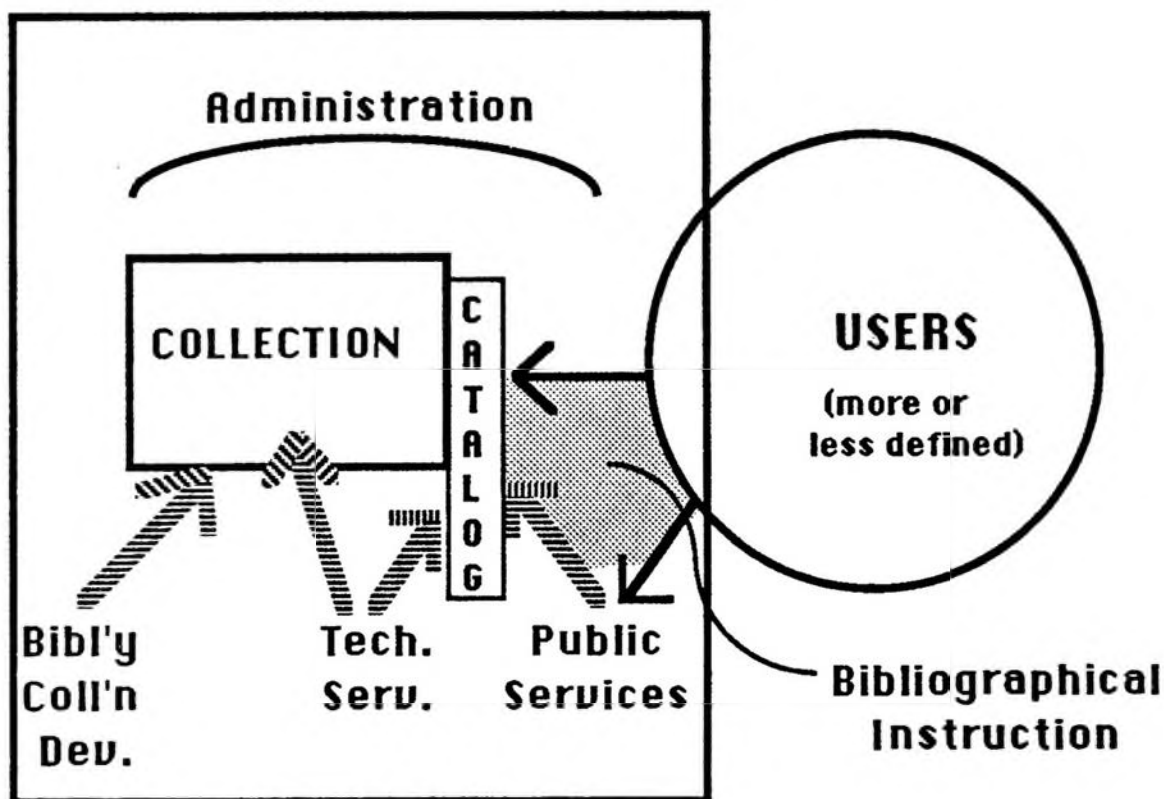
Fig. 1. Older paradigm.

that everything else tends to be thought of and arranged in reference to it. Consider, for example, how libraries are usually organized, the functions and processes of their various elements. Bibliography (selection and collection building) creates the collection and ensures its vitality. Technical services departments acquire, organize, and handle loan transactions related to the collection, each of these activities being manifestations of inventory control over the collection. (Automation and systems work are concentrated primarily in this area.) Public services divisions primarily help the target group make efficient use of the collection. (In this context, bibliographic instruction means teaching patrons to use the library—that is, to find things in the collection. And in its primeval sense, "reference," figuratively speaking, means standing beside the user and pointing out or referring to items within the collection. Finally, an administrative superstructure ensures that each of these functional areas and their respective processes related to the collection not only will work efficiently but will be provided for by funding sources.

The collection as the beginning point also strongly affects other aspects of library work. For example, the collection focus typically provides a basis for evaluating and measuring work. A library, especially an academic research library, is not uncommonly judged first of all by the size of its collections, by how many unique items have been accumulated in given fields of knowledge. Techni-

cal services operations typically measure their work by how many items are processed and the efficiency by which they are handled, while public services, especially reference services, often measure work in terms of the number of transactions made in relationship to the collection—for example, factual questions handled by factual reference works, bibliographical questions handled by bibliographical aids to the collection, and so forth. Likewise, library education programs have traditionally followed the same pattern, providing courses that shadow these same functional processes—reference, cataloging and classification, administration, collection building, and the like.

It is, of course, within this collection-centered context that users interact with the library and engage in knowledge transfer, in information retrieval. Doubtless, the role of librarians in that transfer process varies greatly according to their personal commitment and sensitivity to users. But, regardless of such variations, the position of the librarian in the knowledge access activities of the user (and, as a corollary, the position of the user in the activity of the librarian) is significantly bounded by the collection focus of the paradigm. In short, librarians' considerations of users are typically shaped by collection-centered concerns, collection issues providing a beginning point for thinking and users' needs being framed chiefly in that context. This leads us to amend our abstract portrayal of the sense of the paradigm to that found in Figure 2, the
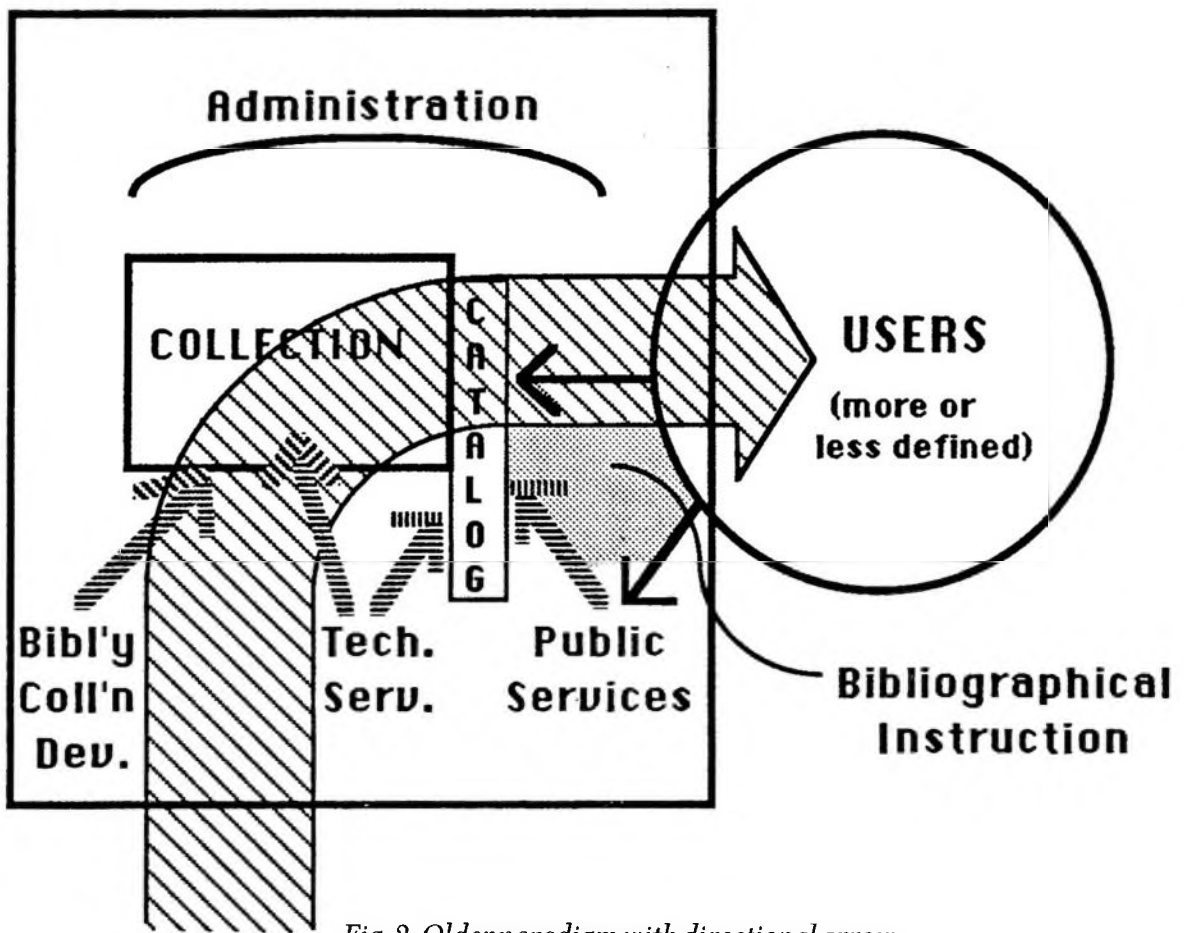
Fig. 2. Older paradigm with directional arrow.

arrow in this portrayal intended mainly to track a thought process that begins with the collection and reaches out to the user only within a framework in which collection issues are central.

The chief effect of this orientation lies in how librarians tend to conceptualize or think about users. It has been my observation that users often remain relatively anonymous, a more or less undifferentiated mass of persons or a set of amorphous groups. The lack of differentiation within particular groups appears to be directly affected by how forcefully the librarian's work is shaped by collection building and maintenance concerns. (This is particularly the case in academic research libraries where many highly specialized tasks allow little contact with users.) For example, it is my observation that for many who work in technical services the users of the library amount to little more than mental images of fingers flipping catalog cards or eyes viewing CRT data entries, and hands pulling books off shelves. For many others, users at best consist only of amorphous general groups such as undergraduates, graduates, professors, and possibly, university staff, with little to differentiate individuals or subgroups within the larger groups.

Occasional interactions by some librarians with individual users might affect how any particular group is conceptualized and, thus, allow them to partially break this pattern of thinking. But gener-

ally such interactions are not pursued from the standpoint of users' integrated knowledge-transfer needs, nor are the groups studied and restudied systematically over time. One might deduce that reference librarians would have the greatest impetus to carefully distinguish between kinds of users and the characteristics of their knowledge needs. Indeed, some have made attempts to do just that. But, it is my observation that even in these cases extensive differentiation is not usual. I conclude that the operational paradigm simply doesn't make room for finer distinctions. When all is said and done, the business of the academic research library is making sure its collections are built and available and giving guidance for their utilization to those who come to them. Users and their needs play a role in this work, but only so far as generalized assumptions concerning them as undifferentiated groups fit collection-centered concerns. Anything else—for example, making finely tuned differentiations of users and their needs—will generally detract from or cause conflict in the central purpose of collection building, maintenance, and use in terms of time and production.

Now some of you will conclude that this portrayal of a library paradigm is terribly narrow or even heavy-handed and that, in particular, it does not give much place to your own rich experience in dealing with users. This conclusion is correct but

only serves to point out the significance of identifying an operational paradigm or pattern. A paradigm is an abstraction at base. It is an attempt to identify the inner core of behaviors and features. In everyday life those behaviors will have a great deal of variety, some of which contradict the pattern identified. The purpose of identifying the paradigm is not to deny that experience. Rather, it is to provide a benchmark, a beginning point against which variations may be measured. By identifying this core, therefore, we are not only able to examine the wellsprings of our daily work but to ask questions of significance about our work as it has existed over time. Two such questions of significance are: where and when did the paradigm arise in its present form? And, how has the academic research library adapted the paradigm to changing conditions since then?

Paradigm source

The paradigm, although having roots that go back for centuries, is essentially the child of the late nineteenth century modern library movement.[6] That movement was primarily rationalized as an educational endeavor, a partnership with public education then on the rise. Its aim was the mental cultivation of the nation's citizenry so as to ensure an enlightened democracy. The most fundamental assumptions of the movement were: first, that the development of the entire range of mental faculties

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[6]A useful overview of the early years of the 19th-century American library movement and one that touches some of the following themes will be found in Wayne Wiegand, *The Politics of an Emerging Profession: The American Library Association, 1876–1917*, Contributions in Librarianship and Information Science, no. 56 (New York: Greenwood Press, 1986), 3–74. More specific elaborations of the very condensed remarks here on the way the movement viewed its purpose and shaped its work, especially with respect to reading, bibliographic tools, and bibliography, will be found in my own *Charles Ammi Cutter: Library Systematizer*, Heritage of Librarianship series, no. 3 (Littleton, Colo.: Libraries Unlimited, 1977), 35–43; *The Subject in the Dictionary Catalog from Cutter to the Present* (Chicago: American Library Association, 1983), 37–44; "User Categories and User Convenience," *Reference Librarian* 9 (Fall/Winter 1983): 113–32; "Melvil Dewey: The Professional Educator and his Heirs," *Library Trends* 34 (Winter 1986): 359–81; "The Columbia School of Library Economy, 1887–1888," *Libraries & Culture* 23 (Summer 1988): 249–80; and "Information Access Requirements: An Historical and Future Perspective," *Advances in Library Automation and Networking* 2 (1988): 45–68.

(i.e., both intellectual and moral capacities) resident in people was especially dependent on good reading; second, that good reading meant reading the best works written by the best minds; and third, that such works had to be read according to the position of their subjects in the naturally systematic universe of publicly established knowledge. Given these assumptions, the tasks of the librarian followed naturally.

First, the librarian was to become a bibliographer—that is, learn the structure of the universe of knowledge with all its branches, departments, etc., and the best works within each part. Second, the librarian was to acquire and organize a collection of books and periodicals that represented the organized universe of knowledge, the "comprehensiveness" of the collection, being how well it represented that universe rather than its number of items. Third, by virtue of his or her mediating position between users and the collection (shelves were not ordinarily open to the public), the librarian was to help users to those best works in a timely, careful way—that is, with sensitivity to each user's progress in mental cultivation. Fourth, the librarian was to pursue each of these tasks as efficiently as possible, efficiency being at the core of Melvil Dewey's special contribution to the development of the field.

Adaptations of the paradigm

Since the late nineteenth century, significant changes have affected the paradigm. One such change was open shelf access, which swept the library field after 1890. The effect on library operations of allowing patrons direct access to materials was immense. Bibliographical aids such as the catalog, the shelf classification, and the like, once provided principally for the librarian in his or her work of reading guidance, were henceforth made primarily for the user as self-help tools. More importantly, the librarian, once in something of a mediating position between users and the collection, came to occupy a place symbolically alongside the user, the latter now engaged in his or her own search for knowledge. In this role, bibliography became "reference," the act of pointing out or of referring users to works when asked. Moreover, with the user pursuing his or her own searches, reference took upon itself the additional task of bibliographic instruction.

Another change that affected the paradigm was the rise of discipline-based academic research, where the basic research model consisted of finding out all that had been published on a topic to ensure the advance of that written record. This change, which began in the university academic setting but spread to industrial and corporate settings as well, became even more complex by the

continuous introduction of new kinds of knowledge records, especially after the 1930s. This development in research method yielded two significant results—the adoption of a "documentation" approach to supplying the published record to users and the acceptance of the idea that a proper research library should acquire a collection of records for the areas of research being supported. In the latter respect, the measure of a comprehensive collection became one of quantity in relationship to the organized universe of knowledge rather than a "best works" representation of the universe of knowledge.[7]

The information era

The most significant change that has affected the paradigm, however, began during World War II and is in progress at the present time. As already noted, this change has typically been described as the advent of the information era; and commentators on it have variously focused on such aspects of it as 1) the enormous increase in sheer quantity and kinds of available information, especially that which arises not as published material but rather as specially generated data; 2) a branching out into different patterns of information use (for example, "big science" team research as opposed to "little science" individual research; mission or problem-oriented research as opposed to discipline-based research; the instrumental use of information as opposed to the intellectual or pastime uses of knowledge, etc.); 3) the widespread adoption of communication and computer-based technologies; and 4) a decided interest in managing the flow of information according to its economic value (for example, in strategies for information management and for the support of decision-making).[8]

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[7]Francis Miksa, *Research Patterns and Research Libraries* (Dublin, Ohio: OCLC, 1987).

[8]In addition to the work cited in the previous note, see also especially Vincent Giuliano, et al., *Into the Information Age: A Perspective for Federal Action on Information* (A Report prepared by Arthur D. Little, Inc. for the National Science Foundation) (Chicago: American Library Association, 1978) and Robert S. Taylor, *Value-Added Processes in Information Systems* (Norwood, N.J.: Ablex, 1986). The latter is particularly useful for its emphasis on a user perspective and on the economics of information retrieval. "Instrumental," "intellectual," and "pastime" categories of information are based on the work of Fritz Machlup, as discussed in Francis Miksa, "Machlup's Categories of Knowledge as a Framework for Viewing Library and Information Science History," *Journal of Library History* 20 (Spring 1985): 157–72.

The information revolution as a user-centered perspective

All of these aspects of the information revolution provide useful insights into the context and environment in which the academic research library finds itself. I contend, however, that in focusing on these aspects individually, the essential core of the change has been obscured. That essential core of change lies in the discovery of the goal (and, to a growing extent, the means) of making knowledge access more specifically responsive to particular knowledge transfer needs. This is true regardless of whether the knowledge transfer needs are expressed by an individual or by groups of individuals and regardless of the character of the use to be made of the knowledge gained. The information revolution, in other words, is not centered fundamentally on the types or numbers of knowledge records available, nor on the orientation of research, nor on the nature of the technology employed, nor on the economics of information transfer, although all of these factors play a role in it. Rather, the information revolution pivots on achieving specificity, on tailoring information retrieval to the specific information transfer requirements of users. In a shorthand way, we might conveniently call this the widespread adoption of a user-centered perspective.[9]

The effect of the information revolution on the library paradigm

The principal effect of the rise of a user-centered perspective has been to cause a growing number of anomalies in the library paradigm, an anomaly being a pattern of behavior that is not explained by the basic paradigm (see Figure 3). One such anomaly consists of the attempt to extend collections translocally by such strategies as cooperative acqui-

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[9]Taylor, *Value-Added Processes in Information Systems*, 23–47, is an especially useful survey of users' decision contexts, although it is hedged in by a tendency to see users in fairly well-defined organizational settings rather than in the kinds of open-ended situations common to general libraries. The general idea of specificity in information retrieval not only represents my own way of pointing out what I conclude is the most remarkable feature of the modern shift in libraries but also constitutes a way to add perspective to those who focus primarily on computer technology as *the* major focus of the changes occurring. Obviously, computers enable us to handle great bulks of materials, to handle such materials quickly, and, with telecommunications, to handle them at a distance. But, in my opinion, that is not their most significant capacity. Rather, it is the "specifying" capacity noted here.
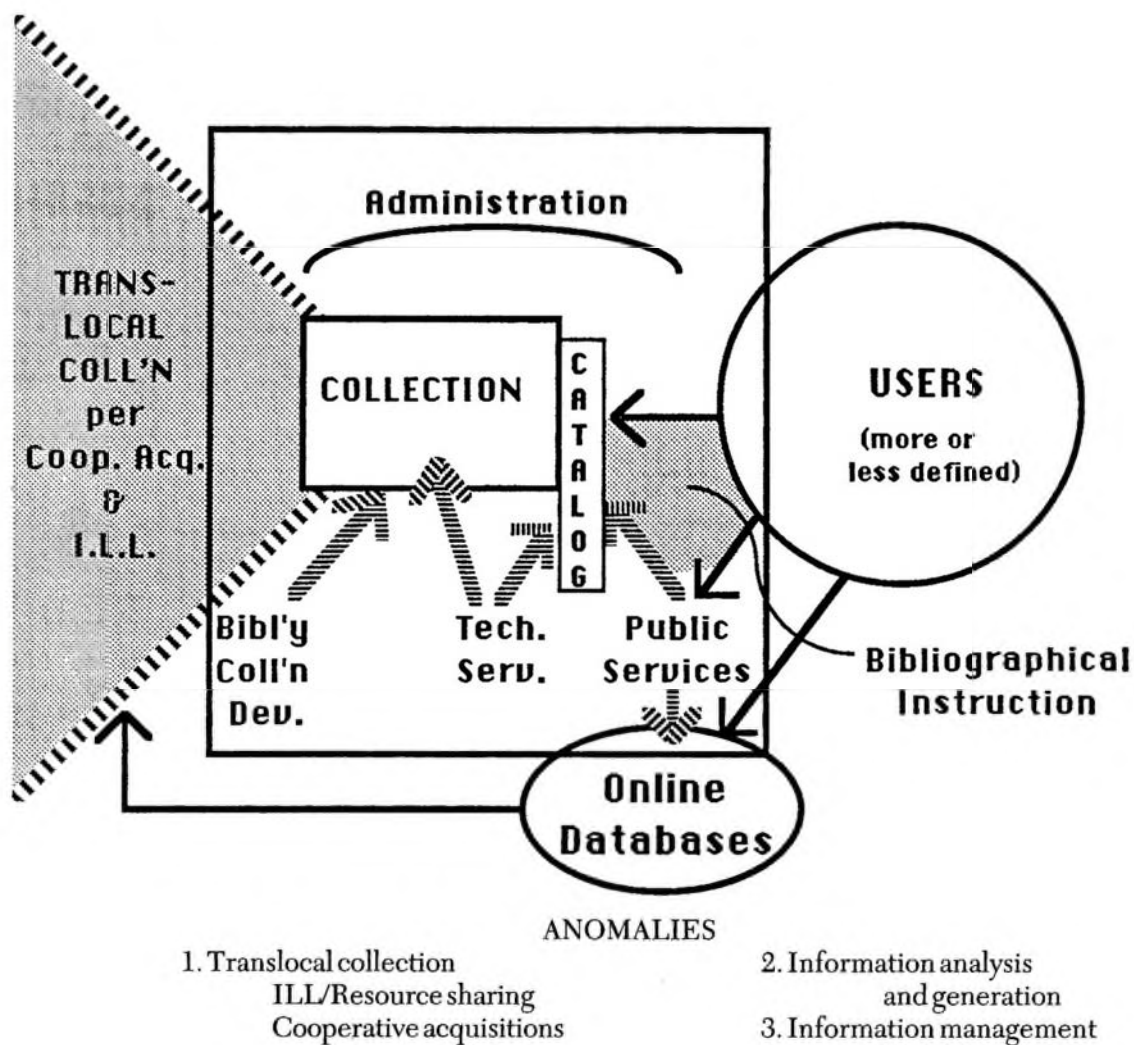
ANOMALIES

1. Translocal collection
   ILL/Resource sharing
   Cooperative acquisitions

2. Information analysis
   and generation

3. Information management

Fig. 3. Older paradigm and anomalies.

sitions, union catalogs, interlibrary loan, and the like.[10] In its fullest expression, this tendency transforms the library into a switching station, where documents may be accessed through some communication system when needed instead of being collected locally. Other anomalies consist of incorporating aspects of information analysis, information management, and information generation into the academic research library program. These activities are not centered on the collection, but rather on aiding users in interpreting, applying, manipulating and producing information, whether the result is retained permanently in the library's collection or not.[11]

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[10]Kuhn, *Structure of Scientific Revolutions*, points to anomalies as unexplainable phenomena that, when sufficient in number, lead to the reformulation of the paradigm. "Translocal" stresses a collection concept that extends beyond simply what can be acquired and owned locally.

[11]See my "Information Access Requirements," 59–63, for a discussion of how various of these aspects may be viewed in the context of the entire spectrum of information retrieval operations.

The essential nature of these anomalies is not that they extend beyond the scope of collecting things to be owned and stored in anticipation of potential use, but in their user-centered orientation. They have appeared in great measure as responses to users' more specific informational needs. They represent, in other words, intrusions of an increasingly user-centered perspective. As such they directly challenge and conflict with the traditional collection-centered paradigm.

They challenge the traditional paradigm because to accommodate them is to have a different beginning point for rationalizing library work than is found in the traditional operational pattern. In the collection-based paradigm one begins with the idea of the collection and then proceeds to the particular processes involved in implementing a collection orientation. Beginning with specific users' needs undercuts beginning with collection concerns by placing those concerns in a derivative position. Beginning with the user's information needs and proceeding from there to whatever actions are appropriate to satisfy those needs might involve collection-building, but then again might not. Building a collection is, in fact, not the central
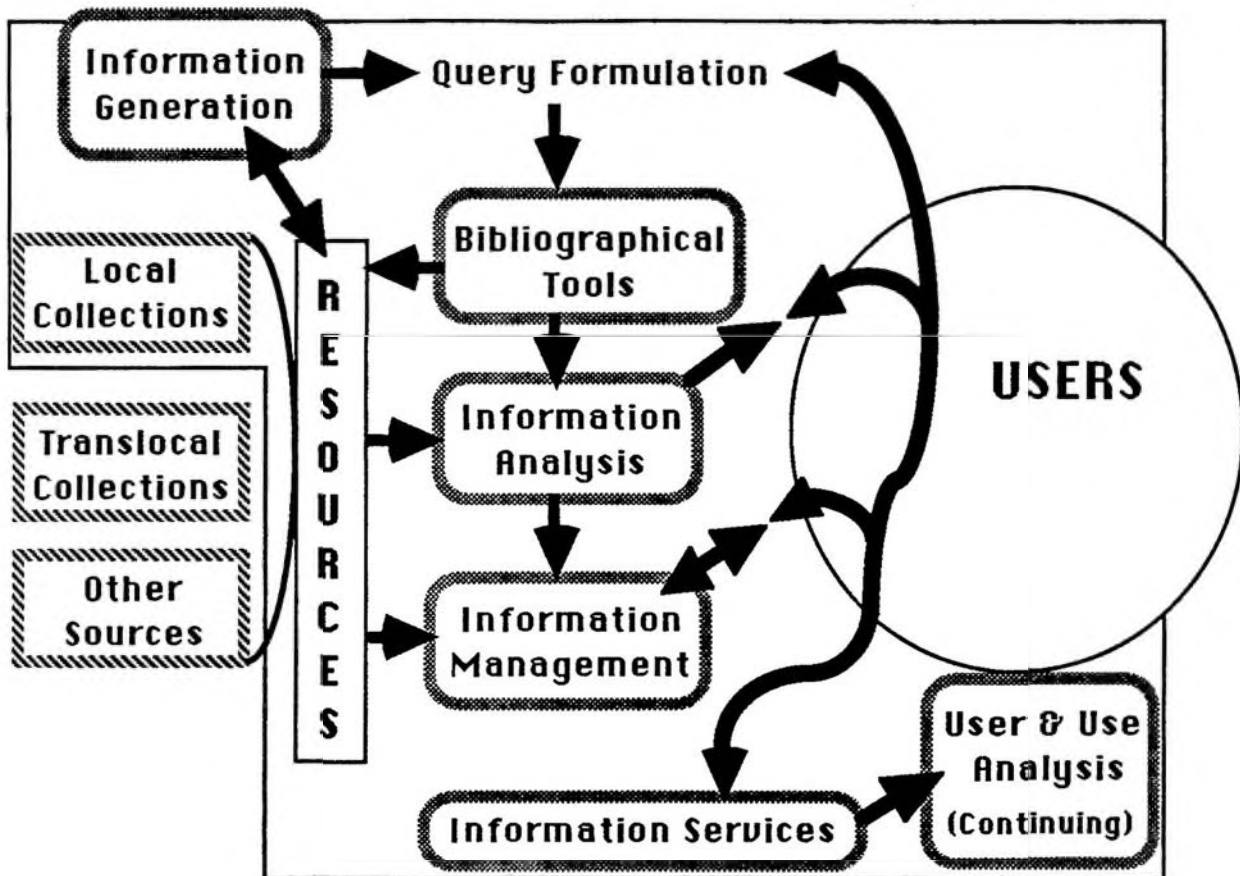
Fig. 4. Revised paradigm.

purpose of the work. Meeting information needs specifically, with appropriate resources and activities, is the central purpose; but an accurate analysis of those needs, especially economically, may require only limited "owned" collections.

The conflict here seems obvious. Two different focuses or beginning points cannot be accommodated in the same operational paradigm. One must begin with either the one or the other. One must plan, in other words, to make collection-building central and work from that point to users' needs as best as can be done, or one must plan to make users' specific information needs central and work from that point to whatever collection-building is appropriate. In sum, the user-centered focus or beginning point results in an entirely different operational paradigm.

Implications of a new paradigm for academic research libraries

The foregoing scenario has far-reaching implications for the academic research library. The academic research library community may choose to ignore the change in perspective, of course. But should the change be embraced intentionally as a new paradigm for rationalizing academic research library work, then it seems that at a minimum the following problems must be addressed. (Figure 4 is

an attempt to show what a revised paradigm yields in terms of a different approach to the work.)

First, it strikes me that user-centered issues must be dealt with directly in their own right and not simply as augmentations of a collection-based paradigm. Up to now, it seems to me, purely user-centered activities, analyses, etc., have functioned chiefly as efforts added on to collection-centered concerns which are more fundamental. What is necessary here is to begin looking at users' needs and information-use patterns with absolutely no preliminary assumptions about the need to build collections. It means, in effect, to discontinue collection-building as a necessary and primary activity.

This does not mean, of course, that collection-building activities will not result from this approach, but rather that the initial questions to be asked at each point would not center on assumptions about such activities. Rather, they would center on such things as: Who are our users? To what extent are our present categories of users and use distinct enough to serve as foundations for highly specified information retrieval? What knowledge-transfer needs and uses do our users specifically have? How are these needs and uses expressed? How do they change over time? How does the social generation of knowledge intersect with their needs and uses of knowledge? How

might we best meet those needs and uses and, particularly, what role should collection-building serve in meeting those needs?

These are doubtless only some of the questions that need to be asked. Even more important would be creating structures of personnel and methods for systematically gathering, regathering, and implementing this kind of information. The critical point in the foregoing is to differentiate users and their information needs more distinctly in the first place, because that should be the beginning point for all other considerations.

Some illustration of what is meant by this for the academic research library may be seen in the following. Instead of characterizing undergraduate users and use only on the basis of, say, lower and upper divisions, more detailed information would need to be compiled (most likely in the form of a management information database) for a greater number of defined subgroups. The information compiled would include information needs assessment and profiles useful for planning and assistance undergraduate retrieval and use of information. Possible categories might consist of all (or most) individual semester-length courses and their individual members; groups and individuals related to major study areas; groups in terms of living arrangements (whether university dormitories, university and other local housing, commuters, etc.); special independent study projects; etc. Graduate level students would likewise be tracked, but with additional profiles on degree-related research proposals and projects. Faculty at all levels would need to be tracked for information needs related to teaching. And intersecting the foregoing categories would be the listing and monitoring of research efforts (especially those of the faculty), project by project and team by team, each with their particular information needs. Obviously, compiling massive amounts of information about groups and individuals in this way will be useful for information service only if information specialists are available to provide help at the point of need. An approach to such personnel needs is discussed below in point four.

Second, the academic research library must attempt to understand in a more detailed way than ever before how collections of any kind of knowledge resources serve actual information uses. The goal here is to identify the conditions under which owned collections, including their kinds, extent, and longevity, are necessary requirements for efficient information retrieval. The assumption has long been that extensive owned collections are absolutely necessary for supporting first-rate research. But to what extent is this really true and for what specific users or user groups is it operative?

The same issues apply to any warehousing project—for example, warehousing spare parts, warehousing foodstuffs, etc.—except that in this case the warehousing is not of physical objects that are intended to be consumed but rather of knowledge records that are reusable to greater or lesser degrees. In all warehousing it is especially necessary to determine what possible trade-offs exist economically and in terms of user demands and satisfaction in not warehousing locally but rather depending on demand-driven access procedures.

Approaching information resources this way does not presuppose, of course, that all library collection building will cease. In fact, it seems obvious that certain collection requirements will not only persist but will be absolutely necessary— for example, those now employed for undergraduates and those that support areas of humanities and social science research principally dependent on the continuing presence of actual documents. The goal is, however, to develop collections only where essential, and not simply to do so as an unexamined goal in all cases.

A parallel issue that must also be broached at this point is that of determining what is to be done with collections already amassed; and what to do with masses of information resources that will become available in the future. One of the principal reasons why materials have been amassed by academic research libraries in the first place is that such institutions were in reality the only agencies extant committed to collecting them. If, however, the *raison d'être* of academic research libraries ceases to be collection-building for its own sake, where would the same documents be warehoused? They will continue to be necessary even if the academic research library does not focus its energies centrally on collection building.

Here one encounters the most striking paradox of the user-centered shift occurring in our society. The capacity to redirect the library's energy away from collection building per se and toward user-needs analysis as a starting point for operations presupposes that documents will be warehoused somewhere. To achieve this, however, will require an entirely new set of institutions and institutional arrangements—for example, a level of institution that exists only for the sake of warehousing, as well as arrangements with publishers and other information resource suppliers to provide materials on demand rather than through classic patterns of publishing. This can be done, however, only on a societal basis. It cannot be the action of isolated libraries or even of the library field by itself without the cooperation of other societal elements.

A third problem to be broached has to do with the nature of information retrieval mechanisms available. For many decades information retrieval tools in the academic research library setting have been focused on making local collections accessible, mainly through catalogs and through shelf

and other storage arrangements. As the translocal collection has become increasingly necessary, union catalogs such as OCLC, RLIN, and WLN as well as other bibliographic and non-bibliographic databases have come to function as extensions of local resources and local bibliographic control mechanisms. Eventually, local bibliographic control must more completely merge with universal bibliographic control so that the record of what is available in the local academic research library setting will more accurately reflect the bibliographic universe of resources that have potential value for local use, whether owned by the local library or not.

A major difficulty exists, however, in the nature of the bibliographic control mechanisms that have been imported into translocal bibliographic databases such as OCLC. Those bibliographic databases are, frankly, not up to the demands of the new paradigm. They put great stress on provisions for known-item and whole-item "exact-match" searching.[12]

But even in their best renditions they do not do well at all for identifying the elements of multi-work items and are very deficient in their subject-access capacities. The major reason for the weaknesses is doubtless the fact that they were originally designed for local collection access, where deficiencies could be ameliorated by personal examination of materials and by browsing local materials.

In contrast, the key to bibliographic control in the new paradigm will be the ability to sift quickly through masses of materials represented only in surrogate form and to zero in on small classes of needed items even when they only partially match a search request. To do this will require, however, a new generation of bibliographic tools that will not be limited by system parameters designed for the older paradigm—tools that not only stress efficient document access but that have systems for helping users more explicitly specify their requests.

A fourth area of difficulty that will have to be addressed is the systematic development of provisions for providing users with information analysis, management, and generation help. Information analysis concerns interpreting information retrieved for specific needs of users. Information management includes helping users organize information retrieved in some useful way for their own specific purposes. And information generation means producing new information tailored specifically to users' needs. Some beginnings in this area have been made by the information industry in general in the form of intelligent workstations and in the form of easily used database and other computational systems which often involve CD drives, Hypertext, and the like, and in other forms of sophisticated software.

It strikes me, however, that this will not be enough. Until independent intelligent systems are built, a matter that appears to be still some decades off, human intermediaries will still be needed to assist users in these tasks—in aiding users to navigate in what Taylor calls the "negotiating space" between information needs and information resource systems.[13] But, this calls for a different approach to user aid than one typically finds in the present library paradigm. At the present time, help for users is typically based on the user coming to the library as a collection-oriented place. However, if thorough user aid is to be accomplished, the idea of user aid must break away from its collection and "place" orientations and move to where the user finds himself or herself. This will require a different kind of personnel structure; one that allows a large group of information professionals to function with relative independence as information counselors or ombudsmen, as likely as not distributed among the users themselves. I envision, in this respect, a level of personnel who are supported by the library but who function much like independent health service professionals in building up and providing services to particular clienteles that change over time.[14]

A fifth area of difficulty to be addressed following from the other four has to do with the organizational structure and operating mode of the library. To move from the older paradigm and its collection building orientation to the newer paradigm with its user-centered focus will plainly require an entirely new approach to organizing the library for its work. The older paradigm, being wedded essentially to a materials-handling rationale, has traditionally been structured and administered as a hierarchical control mechanism over materials-handling processes. In contrast, the newer paradigm emphasizes human needs assessments and personal interaction

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[12]"Exact-match" searching is that which requires that the request for a document (as stated in the query) must be exactly contained in a document systems' text representations; or, stated more simply, that the terms of a query exactly match assigned or derived terms in the indexing vocabulary. The weakness of this strategy is, of course, that texts which only partially match a query are omitted as candidates for retrieval. See Nicholas J. Belkin and Bruce Croft, "Retrieval Techniques," *Annual Review of Information Science and Technology* 22 (1987): 109–45, for a summary discussion of this issue.

[13]Taylor, *Value-Added Processes in Information Systems*, 23–47.

[14]It might even be feasible to fund the subcontracting of such services with a kind of information insurance in the same way that health service is funded by health insurance.

with users. This will require entirely new arrangements for professional work assignments, reporting, and evaluation, where emphasis will be placed primarily on distributed control and independent judgment and decision-making related to ever-changing needs.

A final problem to be solved, and one about which little needs to be said other than its necessity, has to do with educational programs. At the present time, library education programs that supply professionals for academic research libraries are deeply committed to the older paradigm. Programs of this sort will not be very useful to the newer paradigm with its user orientation. Steps must be taken to develop the patterns of thinking, judgment, and methods that will support the new focus.

Of highest importance in this respect would be the development of essential courses that begin with the examination and exploration of users needs and behavior in finding and making use of information.

Conclusion

What has been suggested as problems to be addressed or solved in order to implement a new operational paradigm for academic research libraries could doubtless be greatly expanded and worked out in greater detail. It is hoped, however, that the points made will provide a beginning for that process, assuming, of course, that the analysis of the academic research library on the basis of operational paradigms was accurate to begin with.

The future of reference II: A response

By Cheryl Knott Malone

Reference Librarian, Perry-Castañeda Library
University of Texas at Austin

When I read an advance copy of Fran Miksa's paper I confess to feeling somewhat alarmed that in one short year of RISC programs, it seemed we had gone from abandoning the reference desk to overthrowing the library as we know it.[1]

Professor Miksa first constructs a model of the collection-centered library, then describes the developing anomalies representing user-centeredness: interlibrary service, resource sharing strategies, document delivery, and so on. In holding this model up for our inspection he makes us aware of two important features of our work lives. First, we are operating in a transformative period as we shift our gaze from the collection to the users. And second, he helps us to understand the conflicts we face on the job as a result.

I want to explore these conflicts as a living embodiment of them, for I am both a user-oriented reference librarian and a collection-oriented bibliographer—or vice versa, depending on your interpretation of the paradigm. And I also want to add another element, for these conflicts occur within complex organizations.

In addition to the historical trends Miksa mentioned briefly, collection development and reference activities have changed in the last several years. Collection development generally has moved out of the hands of faculty and into the library. There were several reasons for this transition: the increasing pressure on faculty to "publish or perish" and the resulting lack of time to handle library collection building; dissatisfaction with skewed collections that reflected a specialist's perhaps narrow interests; the professionalization of librarianship. Full-time bibliographers working for the library began to handle selection, making decisions based on formal policies.[2]

More recently, the place of collection development has shifted again, in response partly to the increasing quantity and complexity of the materials becoming available. Full-time bibliographers had little opportunity in their daily work to interact with the patrons using the collections they were building. The establishment of reliable approval plans

[1] "The Future of Reference: A Panel Discussion Held at the University of Texas at Austin, Spring 1988." *C&RL News* 49 (October 1988): 578–89.

[2] Thomas F. O'Connor, "Collection Development in the Yale University Library, 1865–1931," *Journal of Library History* 22 (Spring 1987): 164–89.