Medical Libraries and the Assessment of User Needs*

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ABSTRACT

Users of information in science and technology have been studied in great detail with respect to material read, amount of time spent in reading and searching the literature, categories of questions asked, and so on. Probing for this information has been undertaken by means of structured and unstructured interviews, diaries, surveys, and questionnaires.

Although a large amount of data has emerged on information usage and flow, the subjective response of scientists furnishes comment only on the satisfaction produced by *present* information services and does not yield insight into the extent to which needs remain unsatisfied. Relevance figures based upon the response of systems to questions cannot be equated with satisfaction of needs, since questions constitute, in most cases, inadequate representations of underlying information needs.

Assessment of the needs of users of medical libraries and information systems must, in fact, be made in relation to the observed behavior and experience of biomedical scientists. There is room for well-designed experimentation which can explore the interaction of both psychological and environmental factors. Significant differences in information needs exist among and between individuals such as researchers and clinicians in the same environment. With respect to environment, it is hypothesized that the information needs of medical practitioners in remote areas might differ significantly from those of their colleagues working in large metropolitan centers in close proximity to medical schools, research institutions, and other rich sources of information fallout.

It is anticipated that experimentation will eventually result in a methodology which will permit the determination and prediction of the information needs of any identified groups of users in a specific environment.

THE notion of user needs is not new to librarianship. For decades the customers (or patrons) have been the object of the care and devotion which only librarians can lavish. Unbounded effort is continuously expended in amusing, stimulating, educating, counselling, encouraging, and enticing the customers. Patients sick in hospital beds are cheered by having the library brought to them; libraries on wheels have penetrated the farthest reaches of the ever-expanding suburbs; countless little children each day in storyhour are introduced to the never-never land of Peter Pan; high school students avidly dig into the rich reference sources furnished by libraries; senior citizens are rejuvenated by the intellectual stimulation provided by golden age programs. In this manner wants have been satisfied and needs anticipated. The library user reigns supreme, and, consequently, the library has won a respected place in the community.

In science and technology the library user is held in similar esteem. Considerable effort has been expended to determine what scientists read, amount of time spent in reading, number of journals regularly examined, forms of documents read, types of information sought, categories of questions asked and at what stages of research, age of documents examined, number of citations provided in papers, amount of time spent in searching the literature, and so on (1). Investigators have probed with structured and unstructured interviews, questionnaires, and surveys to elicit such information from scientists (2). Users have kept diaries indicating when they consult the literature and for what purpose relative to their research activity (3). Informa-

tion providers such as librarians have also been queried (4).

INFORMATION USAGE AND USER NEEDS

From all of these interviews, diaries, questionnaires, and surveys a great deal of empirical evidence has emerged with respect to how scientists use the literature and to the flow of information amongst scientists. A categorization of information needs is suggested by some in terms of requests for specific documents, current awareness, specific subject information, retrospective search, and search for research ideas (5). One study identified six types of information which team researchers need: conceptual, empirical, procedural, stimulatory, policy, and directive information (6). Another writer divides information sought into three categories: findings, techniques, and theory (7). Still another author distinguishes between the current approach, the every-day approach, and the exhaustive approach to information (8). A distinction between a person's information needs with respect to primary and secondary areas of interest has also been proposed (9).

Yet the establishment of the general pattern of information usage does not provide a methodology for assessing user needs. Most of the writing to date on the subject of user needs consists of speculation and untested hypotheses. The subjective responses of scientists to repeated questioning furnish valuable comment on the satisfaction provided by *present* information services; they do not yield data concerning the extent to which information needs remain unsatisfied. Users obviously cannot tell you what they are missing.

We must, therefore, concede that there is no accurate way of assessing the needs of any group of users in a specific environment. The design of a system must still be largely intuitive with respect to user needs. As yet, we do not know how to define acquisition policies with any precision or how to design an indexing language which matches the question-asking language of users. Nor do we know the optimum information products to present to the user to satisfy his need. There is, as yet, no adequate methodology to measure the effectiveness of retrieval systems, although some progress has been made in this connection (10).

Relevance scores do not, it is to be noted, provide an adequate measure of the satisfaction of user needs, because questions are only the formalized representations of underlying information needs. The assessed relevance of answers to a question is not to be equated with the degree of satisfaction of an information need. Often a person is unable to express his need adequately in the form of a question, with the consequence that answers may be relevant to the question as stated but not to the need (11). Questions may or may not be an adequate representation of information needs.

CRITERIA FOR DETERMINING USER NEEDS

The assessment of user needs must, in fact, be made in relation to the behavior and experiences of scientists. As Menzel has pointed out: "We will learn about scientists' needs for information by studying what is currently done by them to obtain information, with what yield, and with what impact on their work (12)." We urgently need empirical data with respect to the following: the extent to which information contributes to the creativity and inventiveness of scientists; how the provision of information affects the skill of the doctor with respect to tasks such as diagnosis and treatment; the manner in which formalized information services improve the productivity of bacteriologists *as* bacteriologists, physiologists *as* physiologists, biochemists *as* biochemists; how information is used in the performance of intellectual tasks, such as problem solving and hypothesis formation; the most appropriate information services for various types of scientists and/or scientific activities; the differing needs of researchers at various stages of research; and the differing needs of individuals standing in various relationships to a research project, such as manager, experimenter, reviewer, etc.

I am suggesting that librarianship and information science would be substantially advanced if we were to approach the information problem via the user and his needs and eschew the prevalent tendency to think in terms of gadgets, computers, fads, tricks of the trade, and the rest of the paraphernalia of information retrieval technology. It is tempting to think of user needs in terms of our present capabilities of satisfying them. It is easier to fit the problem to a simple, identifiable solution than to endeavor to define the problem first and then formulate

appropriate solutions. It is also pleasant to imagine that document retrieval can solve all of the problems associated with scientific communication. User needs are far too complex to be satisfied by documents or document representations alone.

User needs are, in fact, satisfied by a variety of information functions currently being performed in addition to document retrieval: packaging of information; critical evaluation of documents; preparation of annual reviews; operation of data banks; compilation of critical tables; listing of conferences, contracts, and researchers; production of compendia of information researchers; and so on. The existence of an informal information network which is heavily used is further evidence that more is involved in the successful transfer of information than the high speed searching of large files (13).

The relation of environmental factors to user needs is of some significance. A retrieval system at the North Pole is more likely to satisfy its isolated users than the same system located together with the same users in Washington, D. C., with its rich concentration of alternative channels of information.

The impact of the library or retrieval system must be considered within its total environmental context. The information needs of a general practitioner in Little Falls, Iowa, are probably not the same as those of a similar practitioner in New York City. In large metropolitan areas there is a rich fallout of information from medical schools and research centers. There exists a reasonably close association between town and gown in medical practice. In rural areas, geographically isolated from medical schools, research institutions, and numerous conventions, the practitioner is professionally isolated. We might hypothesize that, if libraries and publications were available, his dependence upon the written record would be greater than that of his metropolitan colleagues (14). This isolation is clearly recognized in the report of the President's Commission on Heart Disease, Cancer and Stroke (15). Regional centers are proposed to disseminate research findings far beyond the few metropolitan medical centers where specialized treatment and skills are concentrated. It is not certain how people compensate in their information-seeking behavior

for their isolation and lack of personal communication.

CONCLUSIONS

There is a wide-open field for experimental research on the subject of information needs. While investigations of usage patterns help define the total problem in terms of existing channels of information transfer, we are in urgent need of a methodology which will permit us to determine and predict the information needs of any identified group of users in a specific situation. Controlled experimentation must be undertaken with respect to both psychological and environmental variables. Of particular interest would be insight into the information needs of diverse categories of users: the "stars" in a field (members of the invisible college), the outsiders, basic scientists, applied scientists, medical researchers, clinicians, general practitioners, engineers, and so on. System design and library operation would be considerably facilitated if we possessed such knowledge (16).

The role of the medical library is an exciting one. Regardless of the novel means of switching information from one information channel to another, notwithstanding the development of information centers and other specialized facilities, control and exploitation of the written record is indispensable to the success of all other means of information transfer. Precisely how the medical library will fit into the total communication picture is largely up to the ingenuity and resourcefulness of librarians and their insight into user needs.

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