Information and its users

a review with special reference to the social sciences

by J. M. Brittain

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Foreword

This book stands in its own right, but also represents a giant offshoot of the Investigation into Information Requirements of the Social Sciences. The author, Mr. J. M. Brittain, has since October 1968 been Senior Research Fellow in this Investigation, which is being conducted under my direction with the support of the Office for Scientific and Technical Information.

The origin of the Investigation lay in a belief that the information needs of the social sciences had received insufficient investigation, and that some data concerning them was urgently required if appropriate information systems were to be developed for social scientists. A review of relevant literature and work already conducted was obviously an essential ingredient of the Investigation. Mr. Brittain's review however goes well beyond the minimum requirements of the Investigation, and is likely to be of interest to all working in the treacherous field of information needs.

Grateful thanks are extended to all those who have contributed, wittingly or unwittingly, to the work of the Investigation, especially to OSTI, for their encouragement as well as financial support.

MAURICE B. LINE
University Librarian
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Preface

The study of the information requirements and needs of the social sciences has a short history. A few years ago Paisley (1965) attempted to review user studies in the social sciences, and quickly concluded that there were none to review. During the last five years there has been some interest in social science information, and one or two attempts to determine empirically information needs in the social sciences. But user studies on any scale approaching that in science and technology are not to be found in the social sciences.

In science and technology user studies are numerous and have a history of some twenty years. The relevance of the methodology of science user studies to the social sciences is considered in Chapter 2. The pressing need in user studies, in science as well as social science, is for a general body of theory about the flow of information in research and teaching communities. Some of the fundamental characteristics of social science research and its literature which have a bearing upon investigations of information needs and requirements are considered in the first part of Chapter 3, and the second part is devoted to a review of empirical studies in the social sciences. Other relevant material about the use made of information is discussed in Chapter 4 on systemic approaches.

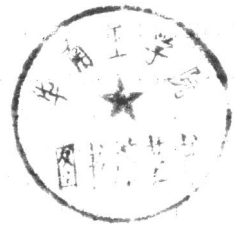
Although this monograph set out, like Paisley's work, to review empirical studies of information needs and requirements in the social sciences, there are precious few to review. A good many of the references in the present monograph have appeared since 1965, and some of them are directly relevant to user studies in the social sciences, but a number of them are of marginal interest only. However, it seemed appropriate to place user studies in the context not only of information science as a discipline, but also in the context of the pressing demands which have been seen during the last few years for the application of social science knowledge.

I would like to acknowledge and thank my colleagues and friends for their help in the preparation of this book. Especially to Maurice Line for his constant help. I have relied so much upon his extensive knowledge of the subject and his tireless attention to detail. I owe a great deal to him: for his original foresight in making an application to the Office for Scientific and Technical Information for support of

research that made the preparation of this monograph possible, for the many references that he brought to my attention, for the many suggestions he made after reading the first draft of the manuscript, for reading subsequent versions, and for many other constructive acts. Coming to an area of scholarship that was new to me I was fortunate in having many colleagues willing to read through the various versions of the work, making helpful suggestions, and bringing to my attention relevant references. Mrs. Brenda White, Miss Vi Winn, and Mr. David Dews have given me much help in this way; and Professor Don Swift looked through parts of the manuscript. My immediate colleagues at Bath, Mrs. Dawn Cunningham and Mr. Frank Cranmer, gave much time and attention to the first draft. Mrs. Joyce Line edited the bibliography and prepared the index. Mrs. Monida Harris and Miss Katharine Sawbridge spent many hours typing and retyping the manuscript. My wife Hilary spent many hours helping me prepare the first draft.

J. M. BRITTAIN

Bath University of Technology
April 1970



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CHAPTER ONE

Preliminaries

1.1 Terminology

1.1.1 *Users and user studies*

Some of the terms to be found in the study of information needs and requirements are ambiguous and can easily lead to confusion.[1] Empirical studies of the use of, the demand or need for, information are usually called 'user studies'. Here 'user' can be read 'user of information', but from a reading of user study it is not obvious whether the study is one of demand, need, or use. Further, ambiguity resides in the term 'use': as most frequently found it refers to the study of the gathering stage of use rather than the use to which information is put once it has been collected or collated. The term is less frequently found in this latter context.[2]

1.1.2 *Information needs and information demands*

The definition of 'information demands' is relatively easy. It refers to the demands, which may be vocal or written, and made to a library or to some other information system. The definition of 'information needs' is more difficult. In some cases needs will be synonymous with demands: for example where the user knows of all the information that is relevant to his work, and makes a demand to an information source. At the other extreme is the user who makes very few demands but has many needs. He may have a felt but unarticulated need (perhaps because

[1]Some idea of the terminological confusion can be gauged from the many different terms used by different workers. For example Wysocki (1969) refers to 'the study of the needs of the users of . . . information'; Fishenden (1965) and Barnes (1965) to 'information use studies'; Martyn (1964a) to 'literature searching studies'; Paisley (1968) to 'use studies'; and the *Journal of Documentation* (1965) to 'information needs studies'.

[2]Wysocki (1969) suggests that this particular ambiguity could be avoided by adopting the term 'information needs studies' for investigations on the influence of information on the development of science, while 'user studies' or 'use studies' could be concerned with studying information processing activities of the user.

of inertia or because he does not have sufficient specific details about the felt need to translate the need into a demand) or he may have an unfelt need (in which case he may not be aware until this is pointed out, at which time he may readily agree that he has a need or he may not realise this until the need has actually been met). One of the problems in this aspect of user enquiry is terminological: there is no suitable word for 'potential user' or 'needer'.

The problem of terminology in this area has often been discussed[3] and there is general agreement about the value of distinguishing between needs and demands, but not about the possibility of empirically discovering needs by asking users. Bernal (1957, p. 197), for example, was not a great advocate of user studies (which he defined in a very limited way) and maintained that they had severe limitations: 'when it is realised that scientists are usually completely untrained in any matters concerned with the storage and collection of information and do not even know what services are available, far less what might be available, their opinion on these questions is probably of little positive value'. In another paper Bernal (1959) continues: '. . . though the user may well know what he *wants* from an information service, he is in no position to know what he *needs* from it, namely what variation in the system would help most to further his work. Consequently, any action based on analysis of present user habits is unlikely to produce impressive results'.

For some time now information scientists have stressed the importance of investigating needs rather than uses or demands—the 'real' information needs as Dannatt (1967) puts it—and this direction of attention has

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[3]Menzel (1967, p. 279) suggested that '. . . "information needs" are not synonymous with either demands or the conscious wants of information users. It is not the information that users are aware of wanting that counts, not even the information that would be "good for them", but rather the information that would be good for science—the progress of scientific research'. Engelbert (1968) makes a distinction between the subjective needs and the objective needs of users. Subjective needs relate to the vague feeling that the researcher may have about the information he requires, and will be very strongly influenced by his style of working and his experience. Objective needs arise in the context of the social circumstances in which the user works. There is a definite correlation between the two. Objective needs are little more than the demands that the user makes upon information systems. One might ask why Engelbert's distinction between objective and subjective needs is necessary, if objective needs are little more than demands. Dannatt (1967) suggests that enquiries about needs may appear to the researcher to be superfluous. Dannatt notes that the information scientist has increasingly been concerned with 'real' needs and that the demand studies do not go far enough in this direction. To the researcher, Dannatt suggests, the needs arrived at by questioning are no more 'real' than the demands for documents. O'Connor (1968, p. 200) takes information scientists to task for speaking, writing, investigating, and attempting to satisfy information

taken place in spite of the doubts expressed by Bernal, O'Connor, and others, but in fact there is no agreement (Rees, 1963) that this movement has been successful in practice. Rees (1963) suggests that most studies which have purported to be of information needs have in fact been of information uses or, at best, demands.

The problems of terminology are not, of course, confined to the social sciences, although there may be special problems in the social sciences (see 3.1 and 3.2 and 3.3) requiring attention. Line (1969a) suggests that any study of need must include a study of use and demand. He supports the multi-method approach which he suggests can go a long way to overcome the difficulties of investigating needs. Line (1969a, p. 7) suggests that by obtaining data on uses and demands, and by carefully distinguishing intended and unintended use, some pointers to unarticulated needs can be obtained. Another approach mentioned by Line is to hypothesise about need from the nature of the activities in which individuals are involved. This is a less reliable, although perhaps a more valid approach than the others, and is perhaps best used to supplement the data obtained by the other methods—rather than adopted as a main method for investigation.

1.1.3 *Operational definitions*

When studies were limited to the demands that users made upon library services, the problem of defining 'need' did not exist. But when the information scientist turned his attention from observation and measurement of library borrowings to enquiries about user behaviour

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needs without clearly defining what is meant by information needs. 'The expression "satisfying a requester's information need" is often used, but its meaning is obscure. The literature on "information need" in relation to retrieval suggests three different (though not inconsistent) possible interpretations. However, each of these interpretations is itself fundamentally unclear.' O'Connor goes on to attempt to clarify these three meanings. Line (1969a, p. 6) discusses the problems of defining information needs, and focuses upon another aspect of needs—what he calls 'unintended use'. He notes that '. . . little attempt has been made in use studies to distinguish "intended use" (= satisfied demand) from "unintended use". Now if it is true that much information seen as "relevant" is gathered in this way, there must be a great deal of "relevant" information that is not gathered at all, or sought in any sense. Some of this is likely to be of importance, in the sense that the activity (research, etc.) to which it is relevant would be furthered if it were known. Its importance is likely to be quite different from that of "sought" information; the latter being central to the activity, the former shedding new light, offering fruitful analogies, extending a conceptual framework, or suggesting possible lines of development. It may act merely as a stimulant; this function may perhaps be performed by almost any information—it does not need to be at all relevant or even related in subject content to set off a useful train of thought—and is perhaps of its very nature best left to chance.'

(using the verbal or written reports of users) he was faced with problems of subjective reports, unreliable data, and defining that which he was attempting to discover.

The usage of recorded material is easy to define and to measure. The behaviour of users in the library, in the laboratory, or in their own rooms when they are working, could be objectively observed; but there are many problems involved in this type of research and it has not been undertaken to any extent. The three most popular methods in user studies—questionnaire, interview and diary—all involve the participation of the user. As soon as the user is invited to participate to this extent the investigator is faced with exactly the same problem that faces the psychologist when he asks the subject for a verbal report. The problem is very familiar and remains a point dividing psychologists. The behaviourist, the exponent of the method of measurement and observation under controlled experimental conditions, demands objectivity and reliability of results; and may sometimes have to compromise on the question of the validity of data. The behaviourist adheres strictly to the operational definition, so that the variables to be studied have no ambiguity. The less strict behaviourist may today be just as meticulous as his more operationally minded colleague in the care he lavishes on the design of his experiment, the collection and the analysis of the data, but his variables are likely to be less tightly defined.

The librarian or information scientist dealing with circulation counts, or demands for information, hardly faces the problem of defining his variables: but the information scientist dealing with information needs and requirements faces the problem both in the design and the data gathering stages of his investigation.

The term 'information' can be ambiguous and lead to misunderstanding. In some cases this ambiguity can be avoided by 'documents' or 'location'—terms more clearly related to physical referents. Referring to the use of 'information' by librarians and information scientists Fairthorne (1968, p. 91) maintains that one cannot be too careful about invisible assumptions contained in the use of the term 'information'. He suggests that '. . . we must get into our minds that we are dealing with records. Also we deal to a certain extent with interpretations of these records, but only inasmuch as interpretations affect people's behaviour when dealing with records. . . . Inasmuch as we inform anybody about anything in an information system, we merely notify them about records'.

Some such clarification of the ambiguity involved in using record,

data, and information is required. Fairthorne's suggestion plays down the problems that face the information scientist or librarian when a 'translation' of a request is required in order to produce any document at all. Fairthorne's suggestion makes good sense when the demand is for a record or document, but many demands are very vague, and require the initiative and expertise of the supplier who must be able to transform a vague expression of a need into details specific enough to retrieve documents.

1.1.4 *Disciplines*

User studies attempting to cover the social sciences have the problem of defining their area of study. Few would disagree with the inclusion of sociology, economics, political science, and anthropology under the general heading 'social science'. There would be less general agreement about the place of psychology, history, education, jurisprudence, and management studies. Some prefer the label behavioural science to social science: but confusion is likely to arise whatever label is chosen. Many psychologists prefer to call their discipline behavioural science rather than social science, but the term can be used in a much wider context. For example, Handy and Kurtz (1964) in their *A current appraisal of the behavioral sciences* include anthropology, sociology, history, economics, political science, jurisprudence, psychology, and education under this heading.

When an investigation is directed to the study of the information requirements of more than one discipline a decision must be made at the outset about criteria of inclusion and exclusion. The disciplines mentioned above (e.g. sociology, economics) are accepted entities with some boundary delimitations, with professional associations, with identifiable activities that can be differentiated from the activities of other disciplines, and with different practical applications. However, there is a group of newer subjects which tend to cut across the established disciplines. Handy and Kurtz (1964) mention information theory, cybernetics, linguistics, sign-behaviour (semiotics), game theory, decision-making theory, value inquiry, and general systems. Handy and Kurtz group together, under the heading 'communication theory', information theory, cybernetics, linguistics and sign-behaviour; and under the heading 'preferential behaviour', game theory, decision-making theory, and value theory. Although some of these newer areas of study were more closely attached in the past to parent disciplines (e.g. game theory and economics) they are now interdisciplinary in

nature. Other fields of an interdisciplinary nature, of longer standing, include criminology and conflict research. Some of the boundaries between disciplines are perhaps pragmatic and perpetuated by the existence of professional associations, university departments, and labels. These discipline boundaries are not always drawn according to the dictates of subject matter and the destination of the results of research, and user studies that are directed to goals other than the maintenance of the *status quo* have to consider carefully the boundaries that are dictated by information requirements and the provision of information, rather than the boundaries that are perpetuated by professional associations, university departments, etc.

1.2 Information science and user studies

User studies form part of a body of study and knowledge that come under the (generally accepted) name 'information science'. Although user studies are not tightly linked in any theoretical framework they are obviously related[4] to many of the activities that go on in information science.

There is general agreement that a science of information[5] is evolving and that it is in a state of rapid change, but less agreement about the form that this new science will take, or about the contribution that

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[4]According to Bourne (1962a), for example, an information system requires: (1) definition of the problem; (2) a determination of user requirements; (3) synthesis and design; (4) evaluation.

[5]There are many definitions of information science scattered throughout the literature. A broad definition was given by R. Taylor in his letter of December 1st 1967, addressed to members of the American Society for Information Science (ASIS), which, with slight revision, was reprinted and distributed in ASIS brochures. Taylor suggests that 'As a discipline information science investigates properties and behavior of information, the forces governing the transfer process, and the technology necessary to process information for optimum accessibility and use'. Taylor states further that information science is 'derived from or related to mathematics, logic, linguistics, psychology, computer technology, operations research, librarianship, the graphic arts, communications, management, and similar fields'. Cuadra (1964) attempted to identify the richest and most essential references in information science (it is obvious from the text that Cuadra limited his attention to information retrieval—an established area from which he saw information science developing) and to determine whether the field had matured sufficiently to show common agreement on the most important conceptual, methodological or practical contributions to the handling of documented information. Cuadra asked three experts in the field to rank order the ten most important contributors. Some agreement was seen between the three lists, and nearly all the contributors mentioned have published since the 1950's. Cuadra analysed the citations in six texts on information retrieval-documentation. These texts contained 911 citations to authors. Of these 911 citations 788 (86 per cent) were unique: that is, they appeared in only

existing disciplines will play. Kochen (1969, p. 186), in a penetrating analysis[6] of the development of information science, maintains that a 'new intellectual discipline seems to be in the making. It is the study of processes by which knowledge grows'. Until very recently, at least in the United States and Western Europe, there has been little concerted effort to establish a conceptual framework for information science, or to define its boundaries (the position in the Soviet Union is slightly different, and this is mentioned below). Developments in information science have gone hand in hand with developments in library science (in fact the distinction between the two is not always made). Work in information science includes activities in traditional areas of library science; for example, classification and retrieval, and more recently, the development of thesauri, autonomic classification, and computer-assisted retrieval. Other activities include the development and assessment of information services (e.g. selective dissemination of information) and the development and assessment of new bibliographical tools (e.g. citation indexes and KWIC indexes). All these activities have been firmly based on library science, and it is only very recently that developments have proceeded so far as to call into question the focal point for these studies.

The orientation of Russian workers is slightly different. There is some confusion in translations from the Russian (and sometimes

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one of the six texts. No single reference appeared in all the texts. Another analysis of four of the most comprehensive bibliographies in the field were examined in detail. The four texts mentioned a total of 7,550 citations. For all authors who were mentioned at least twice (in three of the texts; in the fourth text the authors had to be mentioned three times) in any one text, their publications in the other three texts were tallied. A total of 322 authors were included in the tallies. A list of basic readings was compiled from the published works of the 25 authors who appeared most often in the bibliographies. Kochen (1969) takes a more global view of the information sciences and maintains that the new discipline that is developing cannot as yet be characterised by pointing to some fundamental papers and books, although he suggests that works by Dessauer (1949) on stability, Garfield (1967) on citation indexes and bibliographic coupling, and by Glass (1965) on science and ethical values are first approximations.

[6]In the first 'Distinguished lecture of the American Society for Information Science' Kochen draws an analogy between the way in which a growing literature organises knowledge and the way a learner, by creating models of his environment, is able to take increasingly effective actions. A similar analogy, this time between information retrieval and education, was drawn by Heilprin and Goodman (1965). They suggested that both searching for information and the process of education are subject to, and shaped by, one basic constraint—the very limited human information processing capacity. The germinal theme common to both these papers concerns the user of information, with finite assimilation and processing capacities, in the context of an exponentially expanding universe of documentation.