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TITLE PAGE

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INFORMATION SEEKING BEHAVIOUR – MODELS , MODES & ISSUES

ABSTRACT : The following paper is a study of information seeking behaviour among varied users. It tries to understand this via various models of user behaviour. It further explains the modes of such behaviour & their implications. The paper throws light on information seeking issues , the cycle of user behaviour during information seeking , the link to information storage , the reading environment & the reading activity. This paper hence gives a brief insight into the methods in which users look for & collect information. Such user behaviour then becomes a primary tool in catering to the information needs of the users. The paper thus acts as a beginners study of information seeking behaviour thereby enabling providers of information to perform their job more effectively & thereby ensuring optimum user satisfaction.

KEYWORDS : INFORMATION SEEKING MODELS , MODES , ISSUES , CYCLE

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INTRODUCTION

The present times are called 'the age of information' for a good reason – the amount of information available far exceeds the amount of information that an individual or an organization might seek. Therefore it becomes necessary to discern between “useful information” and “irrelevant information”. The ability to make this distinction, locate and identify the sources of information, critically evaluate the sources and share the information for a given need, is known as 'Information Literacy'.

“The migration of information from paper to electronic media promises to change the whole nature of research” (Witten *et al.* 1995). Through the advent of office computers and the transformation of media, the popularity and usage of digital libraries has increased. Researchers can benefit from the search, retrieval, reading and storage facilities available to them from the comfort and convenience of their own chair. An important issue in this day of human-computer interaction is that not only the information needs of these researchers are met, but user requirements also.

There are specifically two components that are addressed which are distinct in nature and shed light on the behaviour of library users: library-user interaction, and information use and storage. Library-user behaviour covers the information seeking process — from acknowledging a need of specific information to the delivery of the relevant material required to resolve the need.

DEFINITIONS

Information Behavior is the totality of human behavior in relation to sources and channels of information, including both active and passive information seeking, and information use. Thus, it includes face-to-face communication with others, as well as the

passive reception of information as in, for example, watching TV advertisements, without any intention to act on the information given.

Information Seeking Behavior is the purposive seeking for information as a consequence of a need to satisfy some goal. In the course of seeking, the individual may interact with manual information systems (such as a newspaper or a library), or with computer-based systems (such as the World Wide Web).

Information Searching Behavior is the 'micro-level' of behavior employed by the searcher in interacting with information systems of all kinds. It consists of all the interactions with the system, whether at the level of human computer interaction (for example, use of the mouse and clicks on links) or at the intellectual level (for example, adopting a Boolean search strategy or determining the criteria for deciding which of two books selected from adjacent places on a library shelf is most useful), which will also involve mental acts, such as judging the relevance of data or information retrieved. Material published as part of this journal, either on-line or in print,

Information Use Behavior consists of the physical and mental acts involved in incorporating the information found into the person's existing knowledge base. It may involve, therefore, physical acts such as marking sections in a text to note their importance or significance, as well as mental acts that involve, for example, comparison of new information with existing knowledge.

Information Needs is understood in information science as stemming from a vague awareness of something missing and as culminating in locating information that contributes to understanding and meaning. It is an anomalous state of knowledge, or a gap in individual's knowledge in sense making situations. For a person to experience an information need, there must be a motive behind it.

QUESTIONS RELATED TO INFORMATION SEEKING

what constitutes a need for information? , what people think at that particular time? , what actions people take? , what problems are faced while seeking information?

MATERIAL & METHODS - MODELS

1 The Information Search Process Model: Kuhlthau developed this model by using Belkins (1980) anomalous states of knowledge, Kelly's (1963) phases of construction, and Taylor's (1968) levels of needs as theoretical bases. Kuhlthau has conducted empirical studies of students' information seeking behaviour in libraries. Her model includes six stages: Task initiation, Topic Selection, Prefocus Exploration, Focus Formulation, Collection and Presentation.

2 Limberg model : Limberg (1998a, 1998b) quoting Thorsteindottir (2001) posited that content is very crucial to how people seek and use information. Which he said it's contrary to the understanding that information-seeking is a general process which occurs independently of the content in the information. Making reference to the aim of LIS which is to establish a general view of information-seeking restrain the research and limits understanding of the various ways in which people seek information. It was pointed out by Thorsteindottir that if it were accepted that there is more than one type of information process, it would stimulate a deeper understanding of the information seeking process in general within the field. Instead of trying to prove that the information-seeking process can be described with the model, common for different users in different contexts.

3 David Ellis Model : Investigated the behaviour of researchers in the physical and social sciences and engineers and research scientists through semi-structured interviews using a grounded theory approach, with a focus on describing the activities rather than a process. These initial investigations produced six key activities within the information seeking process : **Starting** (activities that form the information search) , **Chaining** (backwards or forwards - following references in initial information sources) , **Browsing** (semi-directed search) , **Differentiating** (filtering and selecting sources based on judgements of quality and relevance) , **Monitoring** (keeping track of developments in an area) , **Extracting** (systematic extraction of material of interest from sources).

Later studies by Ellis (focusing on academic researchers in other disciplines) resulted in the addition of **two** more activities : **Verifying** (checking accuracy) , **Ending** (a final search, checking all material covered)

Location and Delivery of Material : In regard to researching behaviour, there are other aspects that need to be considered that are not discussed by Ellis *et al.* (1993). These are the location and delivery of material and the implications of the decisions made in these areas. Locating a known document or publication reference is often by using an individual's own collection, the library, or the interlibrary loan system (interloan). If researchers do not have the required reference or information in their own collection, they will often resort to using their local library collections.

4 Episodic Model : The episodic model was developed by Nicholas J. Belkin. The episodic model is based largely on intuition and insight and concentrates on interactions with information. There are 4 dimensions which characterise search behaviour. These dimensions can be combined in 16 different ways : Method of interaction (scanning/searching) , Goal of interaction (learning/selecting) , Mode of retrieval (recognition/specification) , Resource considered (information/meta-information)

5 Anomalous State of Knowledge (ASK) : ASK was also developed by Nicholas J. Belkin. An anomalous state of knowledge is one in which the searcher recognises a gap in the state of knowledge. This, his further hypothesis, is influential in studying why people start to search.

6 Wilson's theory of Information Behaviour : Thomas Wilson proposed that information behaviour covers all aspects of human information behaviour, whether active or passive. Information *Seeking* behaviour is the act of actively seeking information in order to answer a specific query. Information *Searching* behaviour is the behaviour which stems from the searcher interacting with the system in question. This system could be a technological one, such as the searcher interacting with a search engine, or a manual one, such as the searcher selecting which book is most pertinent to their

query. Information *Use* behaviour pertains to the searcher adopting the knowledge they sought.

7 Information Foraging : Developed by Stuart Card, Ed H. Chi and Peter Pirolli. This model is derived from anthropological theories and is comparable to foraging for food. Information seekers use clues (or information scents) such as links, summaries and images to estimate how close they are to target information. A scent must be obvious as users often browse aimlessly or look for specific information. Information foraging is descriptive of why and not how people search in particular ways.

8 Life in the round : Developed by Elfreda Chatman. She defines life in the round as a world of tolerated approximation. It acknowledges reality at its most routine, predictable enough that unless an initial problem should arise, there is no point in seeking information. Chatman examined this principle within a small world: a world which imposes on its participants similar concerns and awareness of who **is important; which ideas are relevant and whom to trust.**

9 Sense Making : Brenda Dervin developed the concept of sensemaking. Sensemaking considers how we (attempt to) make sense of uncertain situations. Her description of Sensemaking consisted of the definition of how we interpret information to use for our own information related decisions. Brenda Dervin described sensemaking as a method through which people make sense of their worlds in their own language.

10 Principle of least effort : This explains that information seekers prioritise the most convenient path to acceptable information.

11 Navigators and explorers : This compares the internet search methods of experienced information seekers (navigators) and inexperienced information seekers (explorers). Navigators revisit domains; follow sequential searches and have few deviations or regressions within their search patterns and interactions. Explorers visit many domains; submit many questions and their search trails branch frequently.

12 Information sources: Other people and/or information repositories : Robinson's (2010) research suggests that when seeking information at work, people rely on both other people and information repositories (e.g., documents and databases), and spend similar amounts of time consulting each (7.8% and 6.4% of work time, respectively; 14.2% in total).

Similarities between models : A review of the literature on information seeking behaviour shows that information seeking has generally been accepted as dynamic and non-linear (Foster, 2005; Kuhlthau 2006). People experience the Information Search Process as an interplay of thoughts, feelings and actions (Kuhlthau, 2006). Information seeking has been found to be linked to a variety of interpersonal communication behaviors beyond question-asking, to include strategies such as candidate answers. A search for information may be linked to decision making. The decision involved may vary from a trivial personal matter to a decision which affects billions or may have

cumulative economic or political effects as individual buying or voting decisions may.¹Nicolaisen described four distinct types of information seeking behaviours: visceral, conscious, formalized and compromised. The visceral need is expressed as the actual information need before it has been expressed. The conscious need is the need once it has been recognized by the seeker. The formalized need is the statement of the need and the compromised need is the query when related to the information system.

JISC's study of the Google Generation detailed six different characteristics of online information seeking behaviour : **horizontal information seekers , navigation , viewers , squirreling behaviour , diverse information seekers , checking information seekers.** **Horizontal** information seeking is the method sometimes referred to as "skimming". An information seeker who **skims** views a couple of pages, then subsequently follows other links without necessarily returning to the initial sites. **Navigators**, as might be expected, spend their time finding their way around. Wilson found that users of e-book or e-journal sites were most likely spend, on average, a mere four to eight minutes viewing said sites. **Squirreling** behaviour relates to users who download lots of documents but might not necessarily end up reading them. **Checking** information seekers assess the host in order to ascertain trustworthiness. The bracket of users named **diverse information seekers** are users whose behaviour differs from the above sectors.

Gender and Information Seeking Behaviour : Wiklund (1998) again posited that the academic community is a stratified social structure built on competition and a need to be acknowledged. To him, in this environment men and women do not have the same opportunities and one manifestation is that women have difficulties in gaining access to social networks. This is likely to affect women's access to information, particularly information otherwise difficult to get, since that is usually available through informal personal contacts.

RESULTS & DISCUSSION - MODES OF INFORMATION SEEKING & THEIR IMPLICATIONS

1. Known-item : Known-item information seeking is the easiest to understand. In a known-item task, the user: Knows what they want , Knows what words to use to describe it , May have a fairly good understanding of where to start.In addition, the user may be happy with the first answer they find (though not always) and the task may not change significantly during the process of finding the answer.**2. Exploratory :** In an exploratory task, people have some idea of what they need to know. However, they may or may not know how to articulate it and, if they can, may not yet know the right words to use. They may not know where to start to look. They will usually recognise when they have found the right answer, but may not know whether they have found enough information.In this

mode, the information need will almost certainly change as they discover information and learn, and the gap between their current knowledge and their target knowledge narrows. Design approaches for this mode include: **Navigation** - The most successful design solution will be browse, via navigation of all types. **Browsing** - allows people to take some chances and follow a path, exploring, discovering, and learning as they go. **3. Don't know what you need to know** : The key concept behind this mode is that people often don't know exactly what they need to know. They may think they need one thing but need another; or, they may be looking at a website without a specific goal in mind. This mode of seeking information occurs in a number of situations. **4. Re-finding** : This mode is relatively straightforward—people looking for things they have already seen. They may remember exactly where it is, remember what site it was on, or have little idea about where it was. Design solutions can be active (where the user takes explicit action to remember an item) or passive (where the user takes no action but items are remembered). Active solutions exist on many web sites: wishlists (amazon.com), “save for later” ([emusic](http://emusic.com)), and favorites ([Pandora](http://Pandora.com)). A good passive solution allows users to see items they have seen before, order them by frequency of use, easily get to the content, and the information within it persists over time (longer than the current session). Domains where passive solutions offer value include the following: **Shopping sites** - Users may look at a number of products and may comparison shop before purchasing (e.g. [Target](http://Target.com), drugstore.com, [Anthropologie](http://Anthropologie.com), [Classy Groundcovers](http://ClassyGroundcovers.com), [Expansys](http://Expansys.com)) , **Weblogs**.- Readers may revisit favorite posts and watch comments on a post.

Identifying the modes : Once you understand the modes, examples are easy to spot during user research. Known-items show up in heavy use of search with accurate keywords, when users can easily list what they need from the site and support e-mail will ask for specific content. Exploratory information seeking shows up in search when vague phrases or repeated searches for similar keywords are used; when users express that they are researching, looking for background information, or “finding out about” something; and when support e-mails ask for general information. “Don't know what you need to know” is a little harder to identify. In interviews, users may express that they just want to keep up with things. It may also be clear that users do not have sufficient background knowledge or have not read information they should have. You can identify gaps in content by walking through the content, acting out a scenario from the user perspective, and checking that sufficient information is available. Re-finding is easy to identify if your site has user registration and the logs show what pages people visit. You can also look at the number of items in wish lists.

Table 1 Methods of information seeking
Consult a knowledgeable person in the field
Discussion with colleagues
Discussion with librarian or reference staff of the library

Library catalogue
Indexing journals
Review articles
Discussion with librarian/reference staff of other libraries
Abstracting journals

INFORMATION SEEKING ISSUES

Table 3 Types of information
Types of materials
Textbooks
Periodicals
Newspapers
Exhibition
Government publications
Reference books
Pamphlets
Patents
General books
Thesis/Research reports

Table 2 Purpose of information seeking
For preparing class lectures
For updating knowledge
For writing and presenting paper
For doing research work
For guiding researchers
For doing Ph.D.
For entertainment

Table 4 Problems
Material is not available
Lack of time
Incomplete information materials
Understanding of English language
Information sources are so far located
Information scattered in too many sources
Some of information materials are old
Lack of knowledge in using the library
Information is too vast
Library staff are unwilling for service
Do not know how to use catalogue

TABLE 5 Communication Channels Used for Information-seeking

- 1 Meeting personally / Face to face discussions
- 2 Email
- 3 Telephone
- 4 Postal mail (Writing letter)
- 5 Fax

Table 7 Source for Acquiring Required Information Resources

- 1 Departmental library
- 2 Personal collection
- 3 Purchase
- 4 Main university library
- 5 Colleagues
- 6 Free of cost/Donations

TABLE 6 Location of Information-seeking Activities

- 1 Home
- 2 Departmental library
- 3 Office
- 4 Central library of the university

Table 8 Methods and Sources Used for Current Awareness

- 1 Consulting experts in subject field
- 2 Reading latest books
- 3 Reading newspapers (print and online)
- 4 Discussions with colleagues
- 5 Attending professional conferences, seminars, and workshops
- 6 Browsing shelves in bookstores
- 7 Browsing publishers' catalogues
- 8 Media: TV and radio
- 9 Scanning current issues of print and electronic journals
- 10 Reading newsletters
- 11 Through current awareness services of libraries like CAS, SDI & Content Page Service
- 12 Scanning recent issues of abstracting and indexing tools
- 13 Through email alerts (Listserv)

Table 9 Purposes of Information-seeking

- 1 Teaching preparation or lecturing
- 2 Guiding researchers students
- 3 Support research
- 4 Develop competence
- 5 Keep up with current developments
- 6 Writing a book or article
- 7 Workshop and seminar presentations
- 8 General knowledge
- 9 Service or job requirement
- 10 Reading purposes only
- 11 Carry out administrative work
- 12 Preparation for TV and radio

INFORMATION SEEKING CYCLE

Stage	Task	Thoughts	Feelings	Actions	Strategies
1	Task initiation	Contemplating assignment, comprehending task, relating prior experience and knowledge, considering possible topics	Apprehension of work ahead, uncertainty	Talking with others, browsing library	Brainstorming, discussing, contemplating possibilities, tolerating uncertainty
2	Topic selection	Weighing topics against criteria such as personal interest, project requirements, information available, time available; predicting outcome of possible choices, choosing topic with potential for success	Confusion, sometimes anxiety, brief elation (after selection), anticipation of task	Consulting informal mediators, using reference collections, preliminary searches	Discussing possible topics, predicting outcomes of choices, gaining general overview of topic
3	Pre-focus exploration	Becoming informed about general topic, seeking focus in general information found, identifying possible foci, inability to express precise information	Confusion, doubt, sometimes threat, uncertainty	Locating relevant information, reading to become informed, taking notes, making bibliographic citations	Reading to learn about topic, tolerating inconsistency and incompatibility of information encountered, intentionally seeking possible focus, listing descriptors

		needed			
4	Focus formation	Predicting outcome of possible foci, using stage 2 task criteria, identifying ideas in information to form focus, sometimes characterised by a sudden moment of insight	Optimism, confidence of ability to complete task	Reading notes for themes	Making a survey of notes, listing possible foci, choosing a focus while rejecting others OR combining several themes to form one focus
5	Information collection	Seeking information to support focus, defining and extending focus through information, gathering pertinent information, organising information in notes	Realisation of extensive work to be done, confidence in ability to complete task, increased interest	Using library to collect pertinent information, requesting specific sources, talking detailed notes with bibliographic citations	Using descriptors to search out pertinent information, making comprehensive search of various types of materials i.e. reference, periodicals, non-fiction and biography, using indexes, requesting assistance of librarian
6	Search closure	Identify need for any additional information, considering time limit, diminishing relevance, increasing redundancy, exhausting resources	Sense of relief, sometimes satisfaction, sometimes disappointment	Re-checking information for information initially overlooked, confirming information and bibliographic	Returning to library to make summary search, keeping books until completion of writing to re-check information

				citations	
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Information Use and Storage : Once relevant material has been located and retrieved, information is then extracted for use. How individuals read can be analysed for insight into their behaviour during this activity. Most research into reading concentrates on either identifying letters, words, and sentences when learning to read, or on the cognitive processes involved, or on strategies for reading better or more efficiently. There is very little documented research found on how readers actually behave when confronted with material — where and when reading occurs, what is read, and how information is extracted from relevant material.

During the research period and afterwards it would be of interest to know what happens to the material, information, and notes collected? Also, what sort of format are they kept in? These questions may be answered by looking at the preferences for reading environments. Examples include, a partiality for paper or electronic copy, the original or a photocopy, borrowed or own copy of material. In general, from the research seen, most scholars prefer to have their own hard copy (be it the original or a photocopy). Most, if not all, information is retained and filed for possible use the future. It has already been noted that researchers prefer their own collections; one reason given by scientists is that they then can apply their own classification systems when filing materials.

Reading Environment : An integral part of reading behaviour is the effect of the environment on the reader. The environment can influence concentration and reading ability. Preferences for reading environments are subject to the self-defined factors of users. Factors for choosing a particular reading area can include noise or distractions (or the lack there of), the presence of other people, privacy, seating arrangements, and the availability of other materials.

Reading for Information Use : “In simple terms, information has only one use — ie. the assistance of problem solving” (Ford 1973, p. 88). One main technique for extracting information is by reading. Alternative techniques are listening and viewing an oral discussion, presentation, demonstration, etc. When looking at reading as an activity for extracting information to use, there are positives and negatives associated with reading as an activity for extracting (Norman 1993). Positive aspects of reading are that the individual has control over which portion of text is read, which is skipped, which is repeated, and at any moment they can stop reading. Moreover, it gives them the chance to reflect on what has been read, so that they can contemplate, question, ponder and agree or disagree. On the other side, reading can be comparatively slow and difficult in comparison to other mediums of information. It takes training and practice and “[r]eading ... requires relatively greater effort and thought”

CONCLUSION

From looking at how researchers in the academic and professional roles conduct information seeking and retrieval, it is interesting to note that the library is mostly used as a source for previously identified material, to browse bookshelves (mainly for current awareness), and for the interloan facilities. This definition of library usage is very different from what libraries provide and researchers are recommended to use. To further strengthen the argument, Folster (1995) suggests that improvements to services mean that libraries must focus on document delivery services, current awareness services, and

customised search services, as these are the most utilised facilities. And also training in new technologies.

In most cases, the way in which researchers of different disciplines conduct information seeking and retrieval is very similar. Often the difference between disciplines is in the sources used and the importance attached to the activity. The actual act is the same across the fields. When looking at the differences in the use of libraries by researchers, they are significant. Humanists and social scientists boast that they use the library a lot more frequently than scientists and computer scientists. Professionals, on the other hand, use the library rarely. Most people overall may use the library to retrieve information at some time, but a lot do not know about or use other facilities offered by the library.

Information seeking activity is as varied as the human beings indulging in this activity. Hence in today's day & age it is indeed a challenge for information providers to understand user behaviour. However there lies the key to unlock the secret information desires, cherished & nurtured by the heart of every user. It is hence up to information providers to use this key effectively & provide maximum user satisfaction.

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