INFORMATION SEEKING BEHAVIOUR MODELS: AN OVERVIEW

Information Seeking Behaviour Models: An Overview

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Abstract – The aim of the paper is to review the status of models of information behaviour to discover their relation with one another and propose an integration of the models into a more general framework. It discusses all the information seeking Behaviour models.

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INTRODUCTION

The influence of new technology on Information Seeking is providing a new set of alternative models that more accurately describe the Information Seeking process as a dynamic activity. Models of Information Seeking attempt to describe the process a user follows to satisfy an information need. A model may be described as a framework for thinking about a problem and may evolve into a statement of the relationships among theoretical propositions.

Most models in the general field of information behaviour are of the former variety: they are statements, mostly in the form of diagrams, that attempt to describe an information-seeking activity, the causes and consequences of that activity, or the relationships among stages in information-seeking behaviour. Rarely do such models advance to the stage of specifying relationships among theoretical repositions: they are at a pre-theoretical stage, but may suggest relationships that might be fruitful to explore or test. The need for information is one of the cognitive needs of humankind. Information need causes information-seeking behaviour and these concepts complement one another. Information need and information-seeking behaviour are affected by many factors. Information-seeking behaviour is expressed in various forms, from reading printed material to research and experimentation. Scholars, students, and faculty actively seek current information from the various sources available in libraries, e.g., encyclopedias, journals and, more currently, electronic media.

Information-seeking behavior depends on the reasons for seeking information and the starting knowledge of the individual. Marchionini describes it as, "Information-seeking is a special case of problem solving. It includes recognizing and interpreting the information problem, establishing a plan of search, conducting the search, evaluating the results, and if necessary, iterating through the process again."

Numerous theoretical treatments have been proposed to characterize the information-seeking behaviour, which is complex cognitive process (Belkin et al., 1982, Kuhlthau, 1991, Marchionini, 1995, Saracevic, 1997, Sutcliffe and Ennis, 1998, Jarvelin and Ingwersen, 2004). Information seeking is a basic activity indulged in by all people and manifested through a particular behaviour. Some important models are described below:

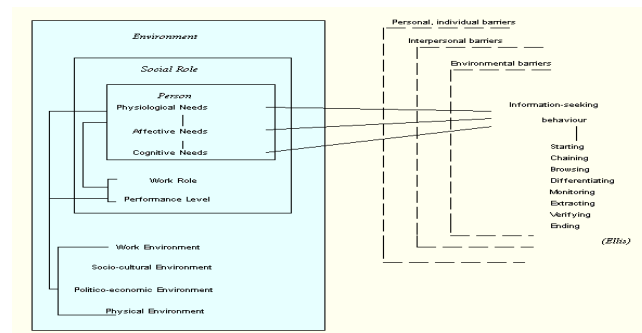## 1. Wilson's model of Information Seeking Behaviour:

Figure 1 - Wilson's Model

This is the simplified model of Wilson that is commonly described as the Macro-model. In his model, Wilson shows how the information need arises, the actual searching process for information and the testable information Behaviour; for example, the information needs differ depending on the work roles or personal characteristics. Therefore, this model can be viewed a well-established theory (Wilson 1999).

The limitation of the model is that 'all of the hypotheses are only implicit and are not made explicit. Nor is there any indication of the processes whereby context has its effect upon the person, nor of the factors that result in the perception of barriers, nor of whether the various assumed barriers have similar

or different effects upon the motivation of individuals to seek information' (Wilson 1999). However, the very fact that the model is lacking in certain elements stimulates thinking about the kinds of elements that a more complete model ought to include (Wilson 1999).
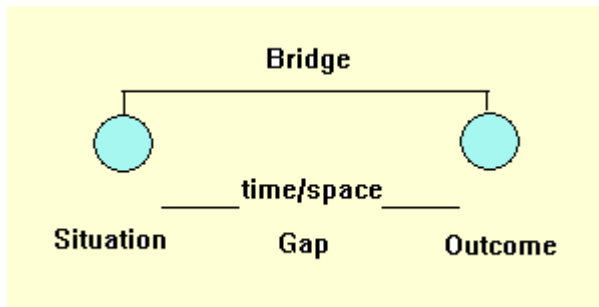
2. Dervin's sense-making model:

Figure 2 - Dervin's Model

Dervin's model is not only seen as an Information Seeking Behaviour model, but 'a set of assumptions, a theoretic perspective, a methodological approach, a set of research methods, and a practice' (Wilson 1999). The model consists of four different aspects. The first aspect is Situation, when the information problem arises. The second aspect is gap, which describes the individual's awareness of the current situation, and the preferred situation. The third aspect is Outcome, which reflects the results of the sense-making process, and finally, Bridge, which is a closing-gap element (Wilson 1999).

3. Ellis' Model of Information Seeking:

The primary model is Ellis' work model with six categories (Ellis 1989). Ellis has stated that these activities are applicable to hypertext environments as:

Starting is identifying the initial materials to search through and selecting starting points for the search. Starting, as its name implies, is usually undertaken at the beginning of the Information Seeking process to learn about a new field. Starting could also include locating key people in the field or obtaining a literature review of the field.

Chaining is following leads from the starting source to referential connections to other sources that contribute new sources of information. Common chaining techniques are followed in references from a particular article obtained by recommendation or a literature search to references in other articles referred to in the first article.

Backward chaining is following a pointer or reference from the initial source. For example, going to an article mentioned in the initial source's bibliography.**forward chaining** is looking for new sources that refer to the initial source; **backward chaining** would be following links on the starting page (be it a online document or

collection of links which we can assume are related in some way) to other sites.

Browsing is casually looking for information in areas of interest. This activity is made easy by the nature of documents to have tables of contents, lists of titles, topic headings, and names of persons or organizations. Browsing is being open to serendipitous findings; finding new connections or paths to information; and learning, which can cause information needs to change. While on the Web, browsing is particularly unconstrained as the most-common way to follow a link is simply clicking the mouse. With link availability and adequate access speed, pursuing a new connection is quite simple. Only the worry of getting lost in an ocean of links might constrain browsing through the Web.

Differentiating is selecting among the known sources by noting the distinctions of characteristics and value of the information. This activity could be ranking and organizing sources by topic, perspective, or level of detail. Differentiating is heavily dependent on the **individual's previous or initial experiences** with the source or by recommendations from colleagues or reviews.

Monitoring is keeping up-to-date on a topic by regularly following specific sources.

Extracting is methodically analyzing sources to identify materials of interest. This systematic re-evaluation of sources is used to build a historical survey or comprehensive reference on a topic.

In follow-up studies, Ellis adds two more features to his model: **verifying**, where the accuracy of the information is checked and **ending**, which typifies the conclusion of the Information Seeking process such as building final summaries and organizing notes.(Ellis 1991)

Currently (Ellis 1997), Ellis has modified his model's features improving starting to surveying. Surveying stresses the activity of obtaining an overview of the locating key people operating in the field. Differentiating has been refined to distinguishing, where information sources are ranked. Distinguishing also includes noting the channel where information comes from. Ellis points out that discussions or conversations are normally ranked higher as well as secondary sources, such as tables of contents or abstracts, than full text articles. This is most likely due to the increased use of electronic resources and their capacity to overload a user.

Filtering capitalizes on personal criteria or mechanisms to increase information precision and relevancy. Typical examples of filtering are restricting a search by time or keyword. When combined with **distinguishing**, where resources are actually

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ranked and sorted, Information Retrieval is alluded to in Ellis' model of Information Seeking.
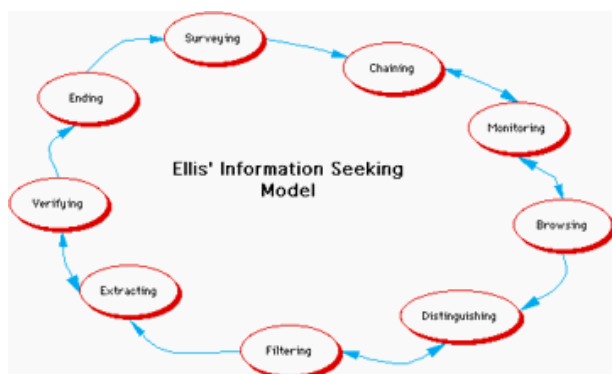

Figure 3 Ellis` Information Seeking Model

4. Kuhlthau's Model of the Information Search Process:

Kuhlthau provides an additional model which focuses on the information search process from the user's perspective. Her six stages in the Information Search Process (ISP) Model are:

1. **Initiation** – beginning the process, characterized by feelings of uncertainty and more general ideas with a need to recognize or connect new ideas to existing knowledge.

2. **Selection-** choosing the initial general topic with general feelings of optimism by using selection to identify the most useful areas of inquiry.

3. **Exploration** – investigating to extend personal understanding and reduce the feelings of uncertainty and confusion about the topic and the process.

4. **Formulation-** focusing the process with the information encountered accompanied by feelings of increased confidence.

5. **Collection** – interacting smoothly with the information system with feelings of confidence as the topic is defined and extended by selecting and reviewing information.

6. **Presentation** – completing the process with a feeling of confidence or failure depending how useful the findings are.

5. Belkin's Information Seeking Process Model:

Belkin provides another view of the Information Seeking process, described as Information Seeking Strategies (ISS). This view can be perceived of as a more task-oriented overlay of either Kuhlthau or Ellis' model. The set of tasks are:

- **Browsing**- scanning or searching a resource

- **Learning** - expanding knowledge of the goal, problem, system or available resources through selection.

- **Recognition** - identifying relevant items (via system or cognitive association).

- **Metainformation-** interacting with the items that map the boundaries of the task (Belkin, Marchetti, and Cool 1993).

Again, this model is not linear or like a typical waterfall flow of process. Belkin even stresses this non-linearity in that he suggests that the model should support "graceful movements" among the tasks.

6. Belkin's Anomalous States of Knowledge:

Belkin also provides some useful perspectives with the Anomalous State of Knowledge (ASK) theory, "the cognitive and situational aspects that were the reason for seeking information and approaching an IR system" (Saracevic 1996). Belkin proposes that a search begins with a problem and a need to solve it - the gap between these is defined as the information need. The user gradually builds a bridge of levels of information, that may change the question or the desired solution as the process continues (Belkin, N.Oddy, and Brooks 1982).

ISP is a 6 stage process, with each stage each encompassing 4 aspects;

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 needed	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
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, taking 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 citations	Returning to library to make summary search, keeping books until completion of writing to re-check information

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CONCLUSION:

Research in Information Seeking supports that Information Seeking on the Web may be understood as a finite number of activities and phases, providing a useful framework for designing data collection and analyzing data from empirical studies. Progress in information technology has offered today's information seekers different opportunities to access the information resources in variety of formats, including commonly-available electronic information sources, such as CD-ROMs, databases, Web-OPACs, and the Internet. In some instances these are replacing the print-based information sources as the primary media for the storage and communication of recorded information.

In other words, information seeking is a dynamic process with varying levels of expertise growing in regard to knowledge about the solution and in using capabilities of the particular information system itself. Belkin approves a system design using a network of associations between items as a means of filling the knowledge gap. By establishing relationships between individual pieces of knowledge, a bridge of supporting information can be used to cross the knowledge gap.

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