CHAPTER – I

INTRODUCTION

1.1 BACKGROUND

In the recent past, scientific knowledge has changed dramatically, once-settled scientific principles have been replaced by more sophisticated concepts, entirely new disciplines and also parallel changes have occurred in medical education, practice and health care delivery system. By the nature of service, medical profession is considered a ‘Noble Profession’. Medical professionals render their services to the suffering humanity. They serve the society reasonably well that the profession is rightly called ‘Noble Profession’. They are motivated by humanitarian consideration with a strong desire to help others and relieve their suffering.

Information is one of the several basic resources that is needed and utilized by the human beings for the development in their fields of interest. The world has moved from the industrial revolution to information revolution. Its activity in the field of science and technology has increased day by day. Technological advances have made information a new basic resource like matter and energy. It provides knowledge and intelligence to the users.
Therefore, information is necessary and the information generated at any point is procured, organized and disseminated expeditiously to its optimum use. Information must be made available at the right time without any barriers.

The present era is called the “Information era.” Information has become the most important element for progress in society. To thrive in this modern era, one needs a variety of information, no matter how well versed one is in a field or profession. Psacharopoulous (1982) discusses the necessity of information in the present age. We can reorganize the educational system and redefine scientific research only with the help of information. Information plays a significant role in our professional and personal lives. People need information to work properly in their fields. “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.

In view of the above, first we find ourselves dealing with more information in all aspects of our lives. More of us are "knowledge workers",
generating, managing, and communicating information to produce and provide goods and services for an increasingly global economy. In addition to the often noted trend towards more people managing more information in the workplace, people must go beyond the workplace to learn new skills and develop new knowledge for doing their jobs. Acquiring new knowledge is no longer done only to prepare for a career, but rather is an essential part of "knowledge work. Lifelong learning as part of the job has long been an important part of professional responsibilities and has spread to all venues of the labor force.

Not only are we required to continually seek and acquire information, but there are increasingly more sources and larger volumes available. Consider the magnitude of the following examples: In 1993 there were 11,296 newspapers and 10,857 periodicals published in the United States alone (Statistical Abstract of the United States 1993); there were 5,500 new book publishers and 136,400 new books added to the 1.5 million books in print (Books in Print, 1993); and the U.S. Government Printing Office offered over 20,000 titles and the National Technical Information Service offered 2,000,000 titles (Informing the Nation: Federal Information Dissemination in an Electronic Age). Not only are the volumes astounding, but the numbers are growing rapidly. For example, 90,300,000,000 pieces of first class mail were sent in 1991 versus 60,300,000,000 in 1980 (Statistical Abstract of the United States 1993); in 1986 there were 378,313 research articles published worldwide in science and engineering alone, versus 267,354 in 1976 (Science and
Engineering Indicators-1991); there were 2490 cable television systems serving 4.5 million subscribers in 1970 and 11, 075 systems serving 57.2 million subscribers in 1992 (Statistical Abstract of the United States 1993).

These large volumes of information are organized into many collections that require secondary and tertiary indexes and directories that in turn grow in size and complexity. The growth of directories and indexes is reflected in competition among different companies that offer phone directories and bibliographic databases. The development of new and alternative organizational structures for dealing with large volumes of information in turn demands more information management skills. In our personal lives, billboards, newspapers, mail, telephone, and television serve as vehicles for incessant information assaults on our senses. To cope with these large amounts of information in our lives we develop complex personal information infrastructures--which require time and effort to build, maintain, and use. These structures include conscious and unconscious filtering and finding strategies for achieving our immediate goals and protecting ourselves from information overload.

Secondly, we deal with information in new forms, especially, electronic digital forms that are more abstract, more dynamic, and more malleable than printed or painted information. Much more information is becoming available
in electronic form. The number of publicly available databases and the database producers has grown rapidly.

Information in electronic digital form is both enabling and complicating. On the one hand, electronic digital information is more accessible--available from anywhere in the world with a few computer keystrokes or mouse-clicks. On the other hand it is less accessible because it is not directly perceivable to humans unaided by technology. We are dependent on machines to express this information in forms that we can perceive. Electronic digital information is manipulable. It allows us to apply the computational power of computers to systematically aggregate, classify, compare, change, and transmit information. Electronic digital information forms allow copies to be made perfectly and recursively, unlike analog or physical forms that degrade over generations of copies. Electronic digital information is simple because it is fully expressed by only two elements (bits), however, it is complex because many levels of coding schemes must be used to map the enormous variety of structure and meaning in the world into binary form. The many sets of codings necessary for humans to "make sense" out of digital information allows the same digital code to be represented many ways; for example, the set of bits 1001101 can be expressed on a display as an upper case "M" or as a set of black and white pixels in a larger image, or as half of a note value for a compact disc recording.
Thirdly, we find ourselves using new tools to manage information--tools that we must learn to use, pay for, and maintain. The primary tool of the information society is the computer. Microprocessors are used to improve the performance of other technologies and computers are increasingly used by individuals to control and integrate other kinds of information technology (e.g., TV, radio, telephones). Computer literacy has become a component in primary and secondary school curricula in all industrialized countries, and billions of dollars a year are spent on training and upgrading workers' computer skills. As more computing technology is developed, more new learning and retraining will be needed, placing demands on our time and financial resources.

1.2 WHAT IS INFORMATION?

In information science the concept of information is defined in many different ways. In the following are definitions which have through the cognitive approach relations with the modern conception of learning. In the cognitive viewpoint of information science:

Belkin (1978) defines as "the information associated with a text is the generator's modified (by purpose, intent, knowledge of recipient's state of knowledge) conceptual structure which underlines the surface structure (e.g. language) of that text". Definition is subsequently elaborated by Ingwersen (1995, 1996) as information being "the result of a transformation of the generator's cognitive structures (by intentionality, model of the recipients' state
of knowledge, and in the form of signs), and "on the other hand information is something-a structure- which, when perceived, may affect and transform the recipient's state of knowledge". Information is seen as "something constructed by human beings" (Dervin & Nilan, 1986).

In this study information is conceptualized generally as something which students need during their studies when they construct meaning about the subjects in the process of learning. After the empirical studies further specification can be made of the concept.

1.3 WHAT IS INFORMATION BEHAVIOUR?

Information behaviour can be defined by the general model of information behaviour developed by Wilson. (Wilson, 1997a).

According to Wilson a general model of information behaviour needs to include at least the following three elements:

• "an information need and its drivers, i.e., the factors that give rise to an individual's perception of need;

• the factors that affect the individual's response to the perception of need; and

• the processes or actions involved in that response."
Taylor (1991) defines information behaviour as the product of certain elements of the information use environment. The elements are:

- "The assumptions formally learned or not, made by a defined set of people concerning the nature of their work.
- The kinds and structure of the problems deemed important and typical by this set of people.
- The constraints and opportunities of typical environments within which any group or subgroup of this set of people operates and works.
- The conscious, and perhaps unconscious, assumptions made as to what constitute a solution, or, better said, a resolution of problems, and what makes information useful and valuable in their contexts."

Based on the definition he believes that the information behaviour of different groups of people also is different.

1.4 INFORMATION NEED

Information need is often understood in information science as evolving from a vague awareness of something missing and as culminating in locating information that contributes to understanding and meaning (Kuhlthau, 1993). Information need is described as an anomalous state of knowledge (ASK) (Belkin et al., 1982) or a gap in individual's knowledge in sense-making
situations (Dervin & Nilan, 1986). Wilson points out that there must be an attendant motive when a person experiences an information need (Wilson, 1997b).

1.5 WHAT IS INFORMATION SEEKING?

Much of human existence is characterized by the notion of search; we seek and pursue material objects such as food or shelter, sensual experiences such as adventure or ceremony, and ethereal objects such as knowledge or justice. We are concerned here with the search for information which we will call information seeking. Information seeking is a process in which humans purposefully engage to change their state of knowledge. The term search will be used to mean the behavioral manifestation of humans engaged in information seeking and will also be used to describe the actions taken by computers to match and display information objects. The term "information seeking" is preferred to "information retrieval" because it is more human-oriented and open-ended. Retrieval implies that the object must have been "known" at some point; most often, whoever "knew" it organized it for later "knowing" by themselves or someone else. Seeking connotes the process of acquiring knowledge; it is more problem-oriented; the solution may or may not be found.
1.6 DEFINITIONS OF INFORMATION SEEKING

Information seeking is a human process that requires adaptive and reflective control over the afferent and efferent actions of the information seeker. Information seekers should begin with finding out what is stopping progress, creating an information gap/vacuum. An important aspect of sense making as a process in the struggle of people to understand a problem that drives them to seek meaning for in many situations and many circumstances they are content to take no such action.

According to Gary (1997) information seeking is a process in which humans engage to purposefully change their state of knowledge. The process is inherently interactive as information seekers direct attention on adapt to stimuli, reflect on progress, and evaluate the efficacy of knowledge base of the information seeker. Information seeking is thus a cybernetic process in which knowledge state is changed through inputs, purposive outputs, and feedback.

Kuhthau (1993) and Chatman (1996) are concerned with the ways the worlds information seeking term has been used by the people in their research work. Such researchers present conceptions of process, learning and social relations that reflect the focus and interest of their research work.
Kuhlthau (1991, 1993) focused on information search process, which emphasizes feelings, thoughts, and understanding of a situation that they need to resolve task, problem, or topic. This particular action led to the action of people as they seek the meaning of useful research in providing a framework for improving information search.

Kuhlthau (1994) and (Bates, 1986) define as understanding the pattern of people information behaviours, the variety, uncertainty and complexity of the information needed by the seekers must be known.

Chatman (1996) stated that, there are barriers and constraints that faced by people during the cause of seeking information on there research work.

1.7 INFORMATION SEEKING BEHAVIOUR

This can be described as an individual’s way and manner of gathering and sourcing for information for personal use, knowledge updating and development. Faire-Wessels (1990 in Kakai et al, 2004) referred to it as the way people search for and utilize information. Kakai et al. (2004) observed that, often students’ information seeking behaviour involves active or purposeful information as a result of the need to complete course assignment, prepare for class discussions seminars, workshops, conferences, or write final year research papers. To (Fister, 1992) undergraduate students may be smart people, but they are still finding the process of research intimidating. Fister
explained that these students do not learn the basic information skills; they only end up using trial and error methods of research. This limits their capabilities to satisfy their needs. Wilson’s 1996 model noted that in the process of seeking information, problems are encountered. While Taylor (1990) also noted that after interacting with the information sources (e.g. library) what a user actually needs may not eventually tally with what is practically available, due to constraints either within the stock or due to the user own inadequacy. Many problems may serve as hindrances for the undergraduates in the process of their search or using the library. These may include library anxiety as asserted by (Mellon, 1986) and users’ perceptions of library and its program. Wilson (2000) defines that Information seeking behaviour is the purpose of seeking 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 Web).

1.8 FACETS OF INFORMATION SEEKING BEHAVIOUR

A person engaged in an information seeking session performs two distinctive tasks: information seeking and information retrieval (Marchionini, 1995; Hearst, 1999). While seeking is characterised as a more human oriented and open ended process, retrieval implies that the object must have been known at some point; most often had been previously organised for later use. Seeking connotes the process of acquiring knowledge. It is more problem oriented as the solution may or may not be found. It is closer to answering questions or
learning. According to Marchionini, (1995) information seeking behaviour could be organised into four levels of granularity as shown in Figure 1.1:

1. At the coarsest level, people exhibit information **seeking patterns**. Patterns are mostly unconscious sequences of behaviours that can be discerned over time and across different information problems and searches. They are influenced by user disciplines, domain and systems.

2. **Strategies** are the approaches that information seekers take to a problem. Two classes of strategies are formalised as analytical searching and browsing strategies. They are the extremes of a range of flexible combinations of strategies (Belkin et al, 1993). Strategies mostly are consciously selected and mainly search specific.

3. **Tactics** are discrete intellectual choices during an information seeking session. Tactics are more focused than strategies, for example narrowing the search space by selecting a date range. Tactical skills clearly distinguish between expert and novice users of on-line systems, are often mentioned as searching skills.

4. **Moves** are finely grained actions manifested as discrete behavioural actions, e.g. doing search, going to advanced search, downloading a document, or even clicking a mouse. Moves are evidences of tactics. They offer observable clues for interface usage and mapping the
intellectual activity at higher levels of action. This study concentrates collecting user moves data and aims to utilise it in order to build models of their seeking patterns.

![Diagram](image)

**Fig 1.1: Four levels of granularity of Information Seeking Behaviour**  
(Source: Shaaban, 2003)

### 1.9 INFORMATION SEEKING MODELS

#### 1.9.1 Wilson’s Model

Wilson made major revision to his 1981 information seeking behaviour model. After his modifications, new ISB model chart was prepared in the year of 1996 (Fig. 2.4). He drew upon research from a variety of fields other than information science. These fields include decision-making theory, psychology, innovation, health-communication and consumer research. The model pictures
the cycle of information activities, from the rise of the information need to the phase in which information is being used.

Fig. 1.2: Wilson’s 1996 Model of Information Behaviour

Gorman (1995) framed a simple model of information seeking in primary care. This model recognized that the central activity of clinicians is patient management, while information seeking is related, external and sometimes unnecessary. This model defines four states of information that need four strategies for responding to an information need so that one could become apparent.

The clinician begins in a state of unrecognized information need. Every clinician is familiar with the challenge of staying abreast of an enormous,
expanding and evolving body of medical knowledge. Yet, confronted with a specific patient problem, the clinician has no way to predict which of these unspecified information needs will occur next. Once confronted with a patient problem, if the clinician becomes aware that he/she does not possess information that is important to its solution, then a state of recognized information need has developed. This information need is often articulated as a clinical question (Covell, 1985) or dilemma (Timpka & Arborelius, 1990).

1.9.2 Gorman (1995) Model of Information Seeking in Primary Care

![Diagram of Gorman's Model of Information Seeking in Primary Care]

Patient Care → Unrecognized Need

Patient Management

Recognized Need → Diagnosis

Problem Resolution

Pursuit

Pursued Information Need → make do

Satisfied Information Need

Information seeking

Fig. 1.3: Gorman’s Model of Information Seeking in Primary Care
Information seeking, however, is only one strategy, and not the most commonly employed strategy, for dealing with an information need once it has been recognized. Another strategy, which clinicians commonly employ, is deferral: when the patient’s problem is not so serious nor treatment so urgent that immediate action is necessary, the best course may be ‘watchful waiting’. As every clinician knows, eventually most disorders either declare themselves, making the diagnosis and appropriate management apparent, or improve on their own, making these questions moot. Another frequent strategy for responding to a clinical dilemma is referral: sending the patient to a specialist who will assume the management of the patient obviates the primary care clinician’s need to pursue information. For clinicians with recommendations for further management, the primary care clinicians need to pursue new information which has been eliminated for all intents and purposes. Often the information that might have been sought will be apparent, if only it is implicitly, in the recommendations of the consultant.

The dominant strategy for dealing with an information need in the context of patient management is simply to act. In majority of the cases, clinicians apparently choose to tolerate their uncertainty, do with the information at hand, and make the best judgement. They can be based on their knowledge of and experience with similar problems as well as their knowledge of and experience with that of an individual patient.
Using this model as a framework, they have been examining the information seeking behaviour of PCCs. The goals of this work are to learn more about these states of information need and how to measure them, and to understand the factors that determine the actions taken by clinicians as they make the transition from one state to the next.

1.9.3 David Ellis Model

David Ellis is a Professor in the Department of Information and Library Studies, Aberystwyth University (UK). He 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. Ellis's elaboration of the different behaviours involved in information seeking is not set out as a diagrammatic model and Ellis makes no claims to the effect that the different behaviours constitute a single set of stages; indeed, he uses the term 'features' rather than 'stages'. These features are named and defined below:

These initial investigations produced six key activities within the information seeking process:

- Starting: the means employed by the user to begin seeking information, for example, asking some knowledgeable colleague;
• Chaining: following footnotes and citations in known material or 'forward' chaining from known items through citation indexes;

• Browsing: 'semi-directed or semi-structured searching'

• Differentiating: using known differences in information sources as a way of filtering the amount of information obtained;

• Monitoring: keeping up-to-date or current awareness searching;

• Extracting: selectively identifying relevant material in an information source;

Later studies by Ellis (focusing on academic researchers in other disciplines) resulted in the addition of two more activities;

• Verifying: checking the accuracy of information;

• Ending: which may be defined as 'tying up loose ends' through a final search.

Fig. 1.4: Ellis Model of Information Seeking
1.10 LIBRARIES: THE PRESENT SCENARIO

In the recent years, libraries and information centres have witnessed a great metamorphosis both in the collection development and the service structure. A significant transformation has been noticed in collection development policies and practices due to availability of e-resources in plenty and easy accessibility to these resources. Print medium is increasingly giving way to the resources that are produced in electronic/digital formats. The availability of CD-ROM, DVD-ROM, and other online resources of bibliographical and full-text databases is quite common in the majority of the educational institutions. The libraries have an option to subscribe to these full-text databases as part of their digital collections. Most of the important publishers now offer web-enabled interfaces and full text of their journals. Some of the important full-text digital collections available on CD-ROM or online include EBSCO, Emerald, Springer, Francis and Taylors, ADONIS, IEEE/IEE Electronic Library (IEL), ABI/INFORM, UMI’s Business Express and Library and General Periodicals, E-Space Worlds, US Patents, etc.

The heterogeneous nature of documents in terms of physical formats, types of content, sources of generation following different standards and that of users carrying both research and development work demanding service suitable to them and co-existence of both old timers loving only print documents and younger scientists asking for documents on to their desktops, the responsibility
of information professionals is becoming much more challenging. The developments in information technology and their applications in libraries for rendering a variety of services have given new dimension to the entire spectrum of information management.

The libraries in the digital era do not have exceptions in acquiring e-resources to meet the requirements of the users who need information as quickly as possible. Since the users in the modern information society are aware of many e-resources useful to them and are able to access to these resources without any difficulty, it is quite challenging for library and information professionals at present to organize and manage the increasing collections. Keeping the demand of users for e-resources in mind, most of the academic libraries have started subscribing to e-resources and the remaining libraries should also be in a position to subscribe to the same. Initiatives in India towards this direction are the implementation of e-consortia like Indian National Digital Library for Engineering Science and Technology (INDEST), UGC-Infonet of INFLIBNET, FORSA, etc.
REFERENCES


