INTRODUCTION
CHAPTER 1

INTRODUCTION

1.1. DEFINITION

The concept information is as old as mankind itself. It has been vital element of the development of mankind. However, there was no social awareness of its importance till late 17th century. The concept of information changed with the use of printing in mid-15th century and when first abstract journal appeared in 17th century, in the same form as today. This was a new information development, considered as a process through which science, arts, technology and culture became more accessible (Curras, 1997). Information has been increasing over the countries. New methods and technologies including computing have been used to process it. During last 2 decades, use of technologies in information processing has reached its peak. The use of computers and telecommunication to acquire, access, retrieve, display and evaluate information has continuously expanded in recent times. At the same time, traditional needs of communication have not ceased to grow. Books and journals proliferated as usual. During the 1990s there was an explosion of materials available on the Internet and of its use. It includes materials derived from such traditional forms of scientific and technical literature, such as journals, patents, data sets, directories, bibliographies, dictionaries and so on. Many publishers are
now moving towards the provision of electronic versions of primary journals in-toto.

Online interaction has provided much easier and speedier physical access to whatever information has been put into machine readable forms. However, intellectual access to materials on the internet are less structured, mainly restricted to some broad classification in directories, in net address and the semantic interaction implicit in hypertext links (Vickery, 1999). Therefore, one problem in present scenario is not a shortage of information or its transfer. The problem is in deciding what is useful and what is right. Although the methods to deliver the information services differ from traditional to digital. There is a clear commonality of purpose and mission among all the sectors and types of libraries: “TO ENABLE USERS TO GAIN ACCESS TO THE INFORMATION THAT THEY NEED” (Brophy, 2000).

The term information is easy to understand and difficult to define. The concept information is used differently in specific disciplines and by individuals in different walks of life. Even though a general definition of information encompasses all the disciplines and allows frameworks, theories and results to be transferred across disciplinary boundaries, still independent definition of information seems difficult even though tried by various experts (Losee, 1997).

The literature, there seems no consensus to the answer what information is. For each and every field of human activity, information is an unavoidable component. “A single precise definition encompassing
all its aspects can in principle not be formulated because the term ‘information’ is used in so many contexts (Belkin, 1978). We have to agree with Hayes when he says “information is slippery concept, amesphous, loaded with connotations and implications and that it has had a variety of meaning and we must have a suitable definition even if it is at the elementary level (Hayes, 1969).

The term information has been derived from two Latin words ‘formatio’ and ‘forma’. Both the terms convey the same meaning of giving shape to something and of forming a pattern. ‘Information’ was also Latin synonym for ‘news’. Dictionaries define information as an action of telling or fact of been told of something news, intelligence or knowledge. Similar view of considering information and knowledge as synonymous term is expressed by various authorities (Chandel & Saraf, 1983).

Many definitions have been attempted. Various service have been also conducted on information definition (Wellisch, 1972; Chandel & Saraf, 1983; Curras, 1988; Losee, 1997). The term data and information are often used inter-changeably but they refer to two distinct concepts. Data are language, mathematical and other symbolic surrogates, which are generally agreed upon to represent people, objects, events and concepts. Simply stated data are raw facts. Information is data placed into a context for its recipient. Information generally carries the connotation of evaluated, validated or useful data (Meadow, 1992).

Information and knowledge is also often used inter-changeably but
there is a difference. Information when further processed becomes knowledge. “Only when men applies information in doing something, thus it became knowledge. Knowledge like electricity or money is form of energy, that exists while doing work” (Duken, 1968).

One of the theories view information as phenomenon and process. Information exists in its own right and produce a reaction that modifies our attitudes and state of knowledge. Information as process is developed consciously from data, documents or events. It is looked for, accepted, apprised and used. All processes produce information (Curras, 1997; Losee, 1997).

Another theory views information, which help in decision making or reducing uncertainty. The decision making process is only possible when information is received and utilized by the human mind (Hoshvosky & Masey, 1968; Yovit et al., 1981; Meadow, 1992).

Further, information has ‘newness’ as a characteristic. Information adds, changes or repeat the representation what is known. Or “we have received we know something new that we did not know before it is always information about something” (Mackey, 1969 & Welsman, 1972).

Information is also defined in terms of message or signal conveyed or intended to be conveyed. “It is content message which is exchanged when adjusts environment in term is changed by the reaction of organism” (Bhattacherjee, 1996 & Neelaghan, 1980).

The above discussion of information makes it clear that generic definition of information is not possible. Losee has tried to attempt one
by defining information as a value attached to a characteristics or variable returned by a function or produced by a process. He defined "information is produced by all processes and it is the value of characteristics in the processes output that are information". The question remains whatever this definition encompasses all the characteristics, which have been mentioned above.

It is clear from the above description that information is complex in contexts, having more than one attribute and to arrive at agreed definition, encompassing all its attributes seems difficult. So, it may be better, though escapists approached to understand the attributes of information rather than defining it (Chandel & Saraf, 1983).

Many attributes or qualities associated with the concept of information assist us in identifying and describing specific information requirement. The various attributes from the above definition can be summarized as follows:

1. Data, information and knowledge are not synonymous terms.
2. Information can be data of value in decision making process.
3. Information is raw material from which knowledge is derived.
4. It has transforming effect on what is known or believed to be known by human being.
5. Information brings change in recipient image (rejection, addition to knowledge, filling up a gap in the initial knowledge or change previous knowledge structure).
In simpler terms, the various attributes or qualities, the information should have one as follows:

- **Timely**: The receipt of information within the time frame it is needed by the recipient.

- **Precision**: The measurement detail used in providing information.

- **Accuracy**: The degree of absence of error in information.

- **Quantifiable**: The ability to state information numerically.

- **Verifiable**: The degree of consensus arrived at among various users examining the same information.

- **Accessible**: The ease and speed with which information can be obtained.

- **Freedom from bias**: The absence of intent to alter or modify information in order to influence recipients.

- **Comprehensive**: The completeness of the information.

- **Appropriateness**: How well the information relates to a user's requirement.

- **Clarity**: The degree to which information is free from ambiguity.
1.2. INFORMATION NEEDS

There is no generally accepted definition in user studies about information needs. Despite, the certainty of the concept, the research efforts to analyze the concepts ‘information needs’ remains a fussy notion (Crawford, 1978).

The concept ‘information need’ as observed by several researchers have found different words used to describe the concept and identical terms used to mean different things (Herner and Herner, 1967); and the difficulty lies in the problem of separating the concept of ‘information needs’ from ‘wants’; ‘demands’; ‘requirements’ etc. (Line, 1974; Robbert, 1975).

The term ‘need’ is abstract, therefore difficult to define. The Oxford English Dictionary (1961) defines ‘need’ is “a state of want or distribution, lack of needs of subsistence or necessary articles, extensive poverty or indigence”.


Menzel (1967) defines ‘information needs’ as “the demand or conscious wants of users”. Information needs may be referred to (i) need ‘expressed by user’; or (ii) need that ‘user cannot express’; (iii) ‘press-out’ or ‘immediate need’; (iv) ‘future’ or ‘differed’ or ‘potential need’.

Thus, these information needs can broadly be classified into three types of user information needs or approaches (Brittan, 1970) as followings:
1. Current information need or approach;

2. Immediate information need; and,

3. Exhaustive information need or approach.

Paisley (1968) clearly explains the following factors affecting the information needs: (i) the full array of information sources that are available; (ii) the uses to which information will be put; (iii) the background, motivation, professional orientation and other individual characteristics of the user; (iv) the social, political, economy and other systems that powerfully affect the user and his works; (v) the consequence of information use, e.g. productivity.

Krikelas (1983) relates ‘information needs’ with uncertainty. So information need is defined as awareness or recognition of not knowing or existence of uncertainty in the personal or work related life of an individual. He categorized needs as immediate or differed on the basis of behaviour. This seems to be essentially the same as Childers (1975) ‘kinetic’ (immediate need) and ‘potential’ (deferred) categories. He further said that, library oriented studies focus on immediate needs whereas, potential needs remain hidden and unconscious.

1.3. MEDICAL PRACTITIONERS

The Oxford English Dictionary (1961) defines practitioners as “one engaged in the practice of any art, profession or occupation; a practical or professional worker in any thing”.

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Therefore medical practitioner can be defined as one who is engaged in the profession of medicine.

A medical practitioner is one who practices medicines (Stadman's Medical Dictionary, 1967). Butterworth's Medical Dictionary (1988) defines medical practitioner as one having "regular application of medical knowledge and skill in the diagnosis and treatment of disease".

The medical practitioners can be classified into two groups, viz. clinicians and non-clinicians. The clinicians are those medical practitioners who are directly in contact with the patients whereas non-clinicians are medical practitioners who are not directly in contact with the patients. Broadly clinicians are those who practice on certain special medicines, e.g., Neurology, Dermatology, Psychiatry etc. whereas non-clinicians are those who cannot practice on special medicine. However, these medical practitioners can be general practitioners, e.g., physiology, pharmacology, anatomy etc.

Medical Council of India has clearly demarcated clinicians and non-clinicians as shown in the Table 1.1:

Table 1.1: Medical Practitioners (Clinical and Non-Clinical section).

<table>
<thead>
<tr>
<th>SECTION</th>
<th>SUBJECTS</th>
</tr>
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<tbody>
<tr>
<td>CLINICAL</td>
<td>General Medicine, Paediatrics, General Surgery, Orthopaedics, Oto-rhino-</td>
</tr>
<tr>
<td></td>
<td>laryngology, Ophthalmology, Obstetrics and Gynaecology, Radiodiagnosis,</td>
</tr>
<tr>
<td></td>
<td>Anaesthesiology, Psychiatry, Dermatology, Venerology &amp; Leprosy, Dentistry.</td>
</tr>
<tr>
<td>NON-CLINICAL</td>
<td>Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology,</td>
</tr>
<tr>
<td></td>
<td>Forensic Medicine, Community Medicine.</td>
</tr>
</tbody>
</table>

Source: Medical Council of India (1999), Minimum Standard Requirements for the Medical College: For 150 admissions annually Regulations.
Besides this group, there are certain super specialized subjects available in Medical Colleges & Hospitals in the North-East India. These are namely, Cardiology, Neurology, Nephrology, Urology, Plastic Surgery, Paediatric Surgery, Cardiothorasic, Radiotherapy, Physical education and Rehabilitation, Gastroenterology, Endocrinology, Hematology, Tuberculosis and Respiratory Diseases. These super specialized subjects are classified under clinicians.

Besides these two groups there are some clinicians who are not affiliated or attached to a college or hospital. These clinicians are doing practice privately by either having their own clinics or attached to private nursing hospitals. These medical practitioners have to have defined as Private Medical Practitioners.

Medical practitioners frequently need the information on medical science research, the diagnosis and treatment of disease and so on, these are known as medical information.

1.4. MEDICAL INFORMATION

The word ‘information’ is used in the context of user studies research, to denote a physical entity or phenomenon, the channel of communication through which messages are transferred or the factual data empirically determined, presented in a ‘document’ or transmitted orally (Wilson, 1981).

Medical information is the information related to medicines. It will include details of patients, treatment given, research conducted, drug
administered, operation theater schedules, management information used by medical practitioners, health services etc.

The other term used in the literature is ‘health information’. The medical information comprises purely information on clinical practices whereas health information includes health management. Difference of interpretation between Europe where medical tends to include the full range of health professionals whereas in the US it usually refers to medical practitioners only (Macdougal et al., 1996). Further, health information is being used to describe the field not specific to medicine but supportive of the full spectrum of health services (Ball et al., 1988). The health care system comprises of the three elements (Leckie et al., 1996):

(1) Personal health care services available to individuals and families through hospitals, clinics, neighborhood centres, and similar agencies, and in physicians offices and the clients' own homes;

(2) The public health services needed to maintain a healthy environment; and

(3) Teaching and research activities related to the prevention and treatment of disease.

Thus health care includes many different groups of professionals namely – Medical practitioners, Nurses, Administrators, Pharmacists, Dentists, Dieticians, Physiotherapists etc.

For the purpose of this study, the term ‘Medical Information’ will be used instead of health information as the study is based on medical practitioners only.
The medical information can be classified into following types (Gorman, 1985):

a) Patient Data: It refers to information about specific person. It includes his/her history, observations from physical examination, and results of diagnostic testing, and demographic information. The usual source of information is patient, his/her family and friends and the medical record.

b) Medical Knowledge: It refers to information which is generalized to the care of all patients. It may exist in the form of (i) original research in the medical journal; (ii) classic descriptions of disease including treatment in standard textbooks; (iii) informal experience of practitioners. Most of the information needs of medical practitioners are concerned with either medical knowledge or patient data or both.

c) Population Statistics: It is the information need related to aggregated data about groups or populations of patients. For most medical practitioners, access to formal population statistics has been through published descriptions of disease prevalence in the medical journal literature. However, this may not be applicable in a given situation because of ethnic compositions, life-style differences and other factors. These days vast amount of data about population statistics available on internet and other electronic sources, allows them better adopt medical practitioners to local population.

d) Logistic Information: It refers to local knowledge about how to get the job done. This is important in day-to-day medical practice as
other types of information, such information is most often obtained from local human resources such as office, hospital staff or colleagues. Though it requires much attention and effort on part of clinicians, logistic information has received relatively little attention from developers of medical information system.

e) Social Influence: It refers to knowledge about the expectations and beliefs of others, especially peers such as colleagues and consultants, but also including patients, families and others in the community. Social influences also receive less attention like logistic information. Even though evidence suggest that this type of information is quite important in determining what practitioner actually do.

Medical practitioners information needs mostly related to care and treatment of the patients, medical knowledge, patient data, drug information, physiological and psychological aspects of diseases (Covell et al., 1985; McClure, 1982; Wood, 1991).

The information needs of medical practitioners pertain to:

(i) Quick reliable answer to questions relating to specific patient’s health promotion;

(ii) Updating information on the technical aspects of his practice;

(iii) Continuing education, a stimulant to think, to read and enquire (Wolfe, 1995).
1.5. INFORMATION SEEKING BEHAVIOUR

Information seeking behaviour means the consequence of a need perceived by an information user. Because, user makes demand upon formal or informal sources or services in order to satisfy their needs, which results in success or failure to find relevant information. Wilson (1999) expresses that, information seeking behaviour arises as a consequence of a need perceived by an information user, who in order to satisfy that need, makes demands upon formal or informal information sources or services, which results in success or failure to find relevant information. If successful, the individual then makes use of the information found and may either fully or partially satisfy the perceived need – or indeed, fail to satisfy the need and have to reiterate the search process. In his model, he shows that part of the information seeking behaviour may involve other people through information exchange and that information perceived as useful may be passed to other people, as well as being used (or instead of being used) by the person himself or herself.

Wilson (1981) defines that, “information seeking behaviour as an alternative to the then common information needs.” According to the author, information seeking behaviour results from the recognition of some need, perceived by the user who as a consequence makes demands on the formal systems such as libraries, information centres on-line service or some other persons in order to satisfy the perceived need.
Again, Wilson (1994) defines the user behaviour and considers the starting point of ‘user studies’ to be the individual user, who, in response to some perceived ‘need’ engages in information seeking behaviour ‘identifies those aspects of information related activity that appear to be identifiable, observable and researchable’.

Others view of information seeking behaviour as path of communication”. The paths pursued by individuals in the attempt to resolve an information need” (Chen, 1982).

Behaviourable approach of Ellis (1989) shows the information seeking behaviour consulting set of strategies, viz., starting, chaining, browsing, differentiating, monitoring, extracting, verifying and ending.

Therefore, we can conclude that, information seeking behaviour is meant for those activities where a person may engage in identifying his or her own needs for information searching, for such information in anyway using or transferring that information.

While literature on potential needs and uses of information by science and technology continues to grow, yet there is lack of need for a conceptual, framework within which the enormous amount of data cumulated can be meaningfully integrated. Paisley (1968) identified five factors to be considered for proper conceptualization of user behaviour:

a) The fully array of information sources that are available;

b) The users to which information will be put;

c) The background, motivation, professional orientation and other individual characteristics of the users;
d) The social, political, economic and other systems that powerfully affect the user and his work; and

e) The consequences of information use, e.g., productivity.

It is difficult to take all these five factors into consideration in one study. There is strong evidence from the literature that information used by the scientists and technologists is conditioned by factors such as nature of work, availability of information and other organizational and personal variables.

1.6. INFORMATION SEEKING STRATEGY

Information seeking behaviour gives rise to information seeking strategy. The word 'strategy' became popular in the literature of warfare and statecraft of the 20th century. It means the art of employing all the resources of a nation or coalition of nations to achieve the object of war and peace (Encyclopaedia Britannica). Even the dictionary defines the concept in relation to war.

The Oxford English Dictionary (1961) defines strategy “the art of a commander-in-chief; art of projecting and directing the larger military movement and operation of a campaign”. The Universal Dictionary of the English Languages (1961) defines that, “the art of conducting a military campaign; specify the art of preparing, moving and using armed forces in a war or so as to secure the initiatives and ultimately win war”.
Therefore, Information seeking Strategy can be defined as the art of preparing, and using information resources so as to secure the initiative and ultimately satisfy the information needs.

Belkin et al., (1995) used the concept while saying “any ISS (Information Seeking Strategy) can be described according to its location along these four dimensions”. The four dimensions are:

(i) activity or interaction (an information search);
(ii) goal of interaction (learning-selecting);
(iii) mode of retrieval (recognition-specification); and
(iv) resource considered (information-meta information).

In other words information seeking strategy consists of one or more cycles, with each cycle consist of one or more interactive feedback occurrences (user input, information retrieval system, output, user interpretation and judgment, user input) (Spink, 1997).

For the present analysis, information seeking strategy will include information needs, information sources, information channels and information barriers together.

1.7. CONCLUSION

Information is complex, having more than one attribute and not a single definition exist encompassing all its attributes. Information is data placed into a context for its recipient and has many attributes or
qualities, viz., timely, precision, accuracy, quantifiable, variable, accessible, freedom from bias, comprehensive, appropriateness and clarity. Information needs are again a complex phenomenon, because the term ‘need’ itself is an abstract concept. Information need for the purpose of this study has been defined as awareness or recognition of not knowing or existence of uncertainty in the personal or work-related life of an individual. Needs are further identified as immediate and potential. Information seeking behaviour means the consequence of a need perceived by an information user. For the purpose of this study, information seeking behaviour is meant those activities or persons may engage in when identifying his or her own needs for information searching for such information in any way and using or transferring that information. Information seeking strategy is defined as the art of preparing, and using information resources so as to secure the initiative and ultimately satisfy the information needs. For the purpose of this study, information seeking strategy will include four dimensions. These are

- Information needs,
- Information sources,
- Information channels, and
- Information barriers.

A medical practitioner is one having ‘regular application of medical knowledge and skill in the diagnosis and treatment of disease’. The medical practitioners are classified into Clinicians and Non-Clinicians
group for further analysis. It is observed that medical practitioner will need medical information. Medical information is information on medical science research, the diagnosis and treatment of disease etc. Further, medical information is classified into following types: patient's data, medical knowledge, population statistics, logistic information and social influence.