Chapter - III

REVIEW OF LITERATURE
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Library is a centre of knowledge and temple of learning established to meet the information needs of its users. It acts as an interface between the source of information and the user. The user is the key person in any information system. It is very often said that all the luxuries of information revolution and the problems of information explosion are centered round the user and his convenience. In view of this, a large number of studies relating to users constituting what is later called user studies have been reported since 1920’s. The literature of Information-seeking behaviour of users available is greatly broad ranging. An attempt has been made to cover number of works that go beyond discussions of the Information-seeking behaviour itself and its direct applications to closely related topics such as Information-seeking.

3.1 Methodology and Source

Library and Information Science Abstracts available online published by Cambridge Scientific Abstracts for the period 1969-2006 has been used for the purpose of searching and identification of relevant literature on the topic and also electronic journals available at www.emeraldinsight.com as covered under UGC Infonet consortia. Among the sources of information consulted by the researcher for this review of literature, some of them are listed below:

Although, it was not possible for the investigator to collect all the original articles on the topic, efforts have been made to identify the relevant literature on the topic. The systematic scanning, browsing and reading of the original documents was undertaken and the appropriate notes were taken and wherever the original documents were not available, the relevant information has been culled out from the abstracts for the preparation of the review.

3.2 Review of Literature

For convenience, the review on Information-seeking Behaviour has been categorized into three parts. The Part-I deals with the Use of Information sources, Part-II is on Information-seeking Methods/Behaviour and Part – III deals with Problems in Information Searching.

3.2.1 Use of Information Sources

Bach's (1957) study indicated that the scientists seek literature particularly advanced monographs, research journals, handbooks, reviews, membership of invisible colleges and colleagues outside the organization in order to obtain up-to-date information on the recent developments in their field.
Barbar (1966) in his critical review of the surveys of scientists' use of libraries has indicated that the handbooks, classified reports, advanced texts, research journals and trade literature were the formal sources used by engineers.

Baruchson-Arbib and Shor (2002) conducted a user survey of 270 students studying for a B. A. degree at Ariel College, one of Israel's largest colleges, to determine the frequency of use of electronic information sources, to evaluate the degree to which the Israeli educational system's efforts to provide electronic equipment are achieving their purpose and to investigate the factors that can increase the use of electronic information services.

Bodensteiner (1970) opined that the professional researcher obtains more than half of the technical information through informal means.

Brittain (1971) emphasized the relatively greater role played by informal sources for practitioners in the field of social sciences.

Carr (2004) revealed that internet has changed the way we communicate. Religious material is amongst the most sought after on the Web, and many new ministries are using the Web to spread their message. Little study has been done, however, on the impact of the Web upon parish communities in England, and the ways in which they are active in the online environment to further the churches' mission; though a major study in the U.S. has shown a big uptake of the Internet there to enhance communications within congregations and to attract new members. This study sought to investigate the patterns of use and provision of online
information by churches, by means of a case study of the Diocese of Southwark in the Church of England.

Choo's (1994) on a study of the information sources used in 'environmental scanning' by chief executives of the Canadian Telecommunications Industry defines environmental scanning as the acquisition and use of information about events and trends in a firm's external environment, the knowledge of which would assist management in planning the firm's future course of action. It suggests that chief executives prefer sources which they perceive to be reliable and relevant in providing information, and that internal and personal sources appear to be more important than external and impersonal sources. It concludes that few chief executives personally use the company library and online database services.

Davis (1965) study on the use of literature by engineers indicated that the manufacturers' catalogue occupied the top position accounting for 85% and it was followed by handbooks (83%), reprints (70%), standards (65%), research reports (58%), preprints (37%) and patents (24%).

Disch (1976) revealed that scientific, technical, and professional and trade journals were the single most widely used formal source of information especially for keeping up-to-date by engineers in their respective field. Though, the abstracting and indexing journals were valued high, they are relatively less used. The technical reports were found to be next only to technical journals in importance though may not be in terms of use.

Disch (1977) considers the information needs of the practical engineer-the person whose job it is to solve everyday problems in industry.
In 1971 a survey of Norway's engineering community showed that engineers are only interested in finding answers for their immediate problems; they have no use for complicated information services. Some findings of a 1974-75 study were that when knowledge of available information and information services is limited, old sources are preferred to new, and ease of use is considered more important than reliability. Users did not feel that they lacked in information. Briefly, the study describes the IDE (Information, Documentation and Evaluation) service to industry provided by the Norwegian Centre for Informatics, and mentions a failed experiment project, to provide a joint information system to 6 Norwegian companies in the TESA group.

Ehikhamenor (1990) examines data from a survey of physical scientists in Nigerian universities to reveal the variety of formal information sources and library services used by them. Primary journals are the most important source. Visits to the university library are infrequent. It is not possible for a university library to stock all the journals needed, and the academic scientists are increasingly dependent on their own resources. More support is needed from the government and the university authorities.

Folster (1989) survey of social science researchers comprising faculty, graduate students, and post-preliminary graduate students; was conducted to determine whether or not the researchers were homogeneous in terms of their use of information sources. The results of the survey indicated that for the most part, they could be treated as one group with an identifiable pattern of information use.
Garg and Ashok Kumar (1984) revealed that the scientists working in different R and D laboratories that they made use of periodicals to a greater extent than conference proceedings, research reports, reports and reviews.

Gilbert (1976) found that the books were most widely used while the abstracts, indexes and bibliographies were rarely used by the teaching staff and nurses of Saloop Area Health Authority.

Havelock et al., (1969) found that, the practitioner-engineers first compare their results with similar results of their colleagues.

Henley (1995) reports a study undertaken in 1993 to ascertain if special educators' information needs and use of sources differed from those of mainstream teachers. An overview of the literature revealed poor use of information sources by teachers and social scientists in general. Results revealed that special educators are shown to parallel the Information-seeking patterns of mainstream teachers; keeping up-to-date is important although informal rather than formal channels are used; and teachers' knowledge and use of secondary sources of information are limited as is their usage of libraries, but that they were hampered by lack of time and knowledge of what was available.

Hepworth (1995) reports results of a user survey of electronic information sources in the Southeast Asian region, focusing on: Singapore, Hong Kong, Malaysia, Indonesia and Thailand. Tables display the coverage of Asian content (in terms such as Asian publications, newspapers) by 9 major online and CD-ROM databases; the number of libraries using different
online hosts in Southeast Asia; specific CD-ROM databases used by special libraries in the survey; internet sites, electronic periodicals and list serves mentioned by survey respondents; and various breakdowns of statistical data collected by the survey.

Herner and Miyatt (1954) in their study of scientists and engineers of rocket fuel research have found that the books (96%) occupied the first rank as sources of information and it was followed by unpublished reports (85%), abstracts (69%), journals (67%), and reviews (25%).

Kauffman (1983), engineers in the Polytechnique Institute depend more on their personal collections than on the information from their colleagues and formal literature sources. Further, it was found that among the formal sources they depend more on technical reports and these were followed by books, monographs and handbooks while solving the technical problems.

Lalitha (1995), on the Information-seeking behaviour of medical and engineering personnel indicated a slightly more dependence on formal and documentary source of information like books, monographs, journals, reports, patents, standards and conference proceedings.

Lancaster (1995) revealed that designers and managers of information services, it is important to have some understanding of the factors that influence the probability that information need would arise in the mind of some individual. This will be sufficiently motivated to seek the needed information, and that he or she will select a particular information
source. The study discusses these factors and attempts to provide a model of Information-seeking behaviour.

Liddell (1990) at the Royal Hallamshire Hospital, Sheffield, to identify drug information sources needed by UK General Practioners (GPs). The questionnaires were circulated to all GPs in the Sheffield Health Authority and the survey concludes that there is a widespread lack of awareness among GPs about the hospital drug information service, but that the service was considered successful by those who had used it. Results of the survey supported the expansion of the hospital based drug information service into the community and concluded that it had a role to play in providing information to GPs.

Liu and Yang (2004) showed their strong preference for easy and fast information retrieval and a significant association between motivation for using information in the field of study.

Maheswarappa and Havanur (1998) reports results of a study, conducted at Karnataka University about the relative importance of information sources among biological scientists and the influence of personal attributes, such as designation, qualifications, sex, age, experience, nature of work and nature of research. It concludes that the personal attributes of biological scientists such as designation, experience and nature of research in a university environment have a bearing on the use of information sources.

Maheswarappa and Trivedi (1986) found that the journal literature was the most important form of literature accounting for 54.33% of the usage
by Indian Food Scientists and it was followed by abstracting and indexing journals (27.68%), books (20.68%), technical reports (12.06%), standards and specifications (5.17%) and conference proceedings (3.44%).

**Majid and Abazova (1999)** report the results of a study, undertaken at International Islamic University Malaysia, to investigate the relationship between computer literacy of academic staff and their use of electronic information sources. The impact of other factors such as age, gender and educational background on the use of electronic information sources was also investigated. A statistically significant relationship was found between computer literacy and the use of electronic information sources and services. The study reveals that computer literature academics use electronic information sources more frequently. Similarly, a significant relationship is noted between the age of academicians and their use of electronic information sources.

**Meadows and O'Connor (1969)** revealed that the astronomers and space technologists have made extensive use of reprints and preprints.

**Meadows (1974)** in the field of Astronomy and Space Sciences, the more senior a scientist is, and the more prolific an author he is. Further, he is likely to spend more time on informal discussions.

**Pangannaya and Ramakrishna Rao (1993),** in their study found that R and D personnel of large scale industries use books as a major source of information and it was followed by journals, technical reports, standards, handbooks, conference proceedings, databases, patents, theses,
directories and unpublished reports. It was also found that the 90% of R and D Personnel get the information by discussions with colleagues.

Renford and Eagleson (1982) discuss the information needs of family physicians and analysed how they use information resources. The historical development of family practice is also reviewed and presents demographic data about family physicians, their patients and practices to put their information needs into proper perspective and concludes with recommendations on how libraries can better meet the needs of family doctors.

Rodenburg (1992) conducted a survey to understand the patterns of information use made by 92 staff at Oce-Nederland. In order to collect information for improving services the study examined the time professionals spent on information gathering, what their requirements were, and what sources were most useful. It was found that researchers spent an average of 24 hours weekly on communicating with colleagues and information gathering. The most useful sources of information were fellow researchers, followed by the library and departmental information services. The study showed that services take very little account of the individual interests and needs into consideration.

Rowley (2002) draws conclusions on work conducted under a major JISC project designed to investigate the use of electronic information resources in higher education with a view to offering insights that may be relevant to the use of information in a range of other environments. The key themes are: acknowledging and accommodating diversity; information skills and intervention for change.
Slater and Fischer (1969) stated that engineers made heavy use of data books and text books than scientists.

Sridhar (1987) indicated that 52% of Indian Space Technologists depend mainly on journals, discussions with colleagues (13%), and trade literature (9%). Besides these, books, reports, newspapers, preprints and lectures were also considered quite useful for technologists for keeping themselves up-to-date in their field.

Summers, Matheson and Conry (1983) current research on information retrieval suggests that greater attention be given to the study of information habits and needs of users of information. It has also been suggested that the user be viewed more broadly as existing within interacting cognitive, emotional, and social systems. The findings of the study offer support for the notion that information source use by educators is the result of a complex set of interactions among variables and that the examination of the interaction of personal, professional, and psychological attributes of users provides a useful beginning in understanding the dimensions influencing the use of information sources.

Tadasad and Metesheela (2001) report on a study of 204 Post Graduate students of Gulbarga University, India, which demonstrated the relative importance of information sources. Books, newspapers, magazines, class notes and notes of seniors were the most useful sources: dictionaries, encyclopaedias and scientific periodicals also rated as useful, but a large variety of other sources including the library catalogue were hardly ever consulted. The study also showed that personal attributes of students, place
of habitation, and frequency of visit to the campus have no bearing on the use of specific sources of information. Tripathi and Prasad's (2001) study deals with the Information-seeking behaviour of scientists in physical and social sciences and highlights various sources and methods followed by the scientists to locate required information and also discusses various types of information and bibliographical sources used by the scientists.

**Tonta (1996)** examines the use of networked information sources in scholarly communication. Networked information sources are defined broadly to cover: documents and images stored on electronic network hosts; data files; newsgroups; list serves; online information services and electronic periodicals. He reports results of a survey to determine how heavily, if at all, networked information sources are cited in scholarly printed periodicals published in 1993 and 1994. Twenty Seven printed periodicals, representing a wide range of subjects and the most influential periodicals in their fields were identified through the Science Citation Index and Social Science Citation Index Journal Citation Reports. Ninety seven articles were selected for further review and references, footnotes and bibliographies were checked for references to networked information sources. Only two articles were found to contain such references. He concludes that, although networked information sources facilitate scholars' work to a great extent during the research process, they have yet to incorporate such sources in the bibliographies of their published articles.

**Tornudd (1959)** conducted the study on Danish-Finnish research workers indicated that the journals occupied the first rank accounting for
99%, while it was followed in decreasing order by books (97%), abstracts (83%), review (63%) and unpublished reports (61%).

Verhoeven, Boerma and Jong (1995) review the use of information sources by family doctors as important for both practical and theoretical reasons by analysing the ways in which family doctors handle information. It also reports on a review of the literature on information use by family doctors. The data showed that family doctors used colleagues most often as information sources followed by periodicals and books. This outcome corresponded with results found for other professions. Several factors influenced the use of information sources by family doctors, including the physical, functional, and intellectual accessibility of the sources; the doctor's age; participation by the doctor in research or education; the social context of the doctor; practice characteristics; and the stage of the information gathering process.

Wakeham (1992) revealed that libraries were found to be relatively less used by nurses in UK except when research was undertaken. The book forms, the most popular source of information used by nurses accounting for 85% and just over 60% of nurses use journal articles.

Wilkin (1981) refuted the general findings that engineers read less than other professionals stating that the complex relationship between engineers and their sources of information is still not well understood and findings were often interpreted out of context.

Williamson (1990) found that the nurses in Biomsbury Health Authority used more books than journals.
Wolek (1969) in his comparative study observed that the scientists depend more on formal sources whereas engineers depend more on informal sources and that scientists contact colleagues outside the laboratory more frequently than engineers.

Wood and Hamilton (1967) reported that the mechanical engineers engaged in research and teaching made greater overall use of literature and those engaged in practical aspects of engineering like design, testing and maintenance used data sheets, handbooks, BSI documents and trade literature.

3.2.2 Information-seeking Methods/Behaviour

Agosto and Hughes-Hassell (2005) present preliminary findings from a research grant on the Everyday Life Information-seeking (ELIS) behaviours of urban young adults. Twenty-seven teens aged 14 through 17 participated in the study. Qualitative data were gathered using written activity logs and semi-structured group interviews. A typology of urban teens' preferred ELIS sources, media types, and query topics is presented. The typology shows friends and family as preferred ELIS sources, cell phones as the preferred method of mediated communication, and schoolwork, time-related queries, and social life as the most common and most significant areas of ELIS. The results indicate a heavy preference for people as information sources and that urban teens hold generally unfavourable views of libraries and librarians. The conclusion lists questions that information practitioners should consider when designing programmes and services for urban teens and calls for researchers to consider this often-ignored segment of the population as potential study participants.
Aims (1965) observed that even for systematic literature search, the librarian was not consulted in more than 70% of cases by physicists and chemists in UK.

Ajiboye and Tella (2007) examined the Information-seeking behaviour of undergraduate students in the University of Botswana. Specifically, the study made effort to determine the sources consulted and the general pattern of information gathering system by the students: the impact of students' gender, level of study and course of study on the students' Information-seeking behaviour. The study adopted a descriptive survey design and data was collected using a questionnaire administered to two thousand respondents randomly selected from six faculty in the University of Botswana, Gaborone, Botswana. Major findings from the study include: first, academic information was rated as the predominant information required by the students, while the internet was rated the most crucial source of most of the academic information required. It was also found that gender, level of study and course of study significantly influence students' Information-seeking behaviour ($F = 511.8$, level of signification is 0.05). However, among the factors, the students' level of study contributed more to the observed variation in Information-seeking pattern, followed by course of study, while gender had the least influence. The sample was taken in two departments one from each of the faculty in the University. This is a typical representation of the population of the undergraduate students of the University of Botswana hence; the findings could be generalized for the whole undergraduate students of the University. The paper is a product of recent survey carried out by the authors; hence the findings reported here
are original and reflect the current views and practices of Information-seeking behaviour of University of Botswana Undergraduates.

**Barrett (2005)** made an exploratory research study on the Information-seeking habits of graduate student researchers in the humanities, by conducting in-depth interviews with a small sample of humanities graduate students, were used to explore to what extent humanities graduate students might constitute a user group distinct from faculty and undergraduate models.

**Branch (2003)** examined non-traditional undergraduates' home, work, and school Information-seeking and the perceived impact of an information literacy course on their Information-seeking behaviours. The participants in the study were students in the College at Work (CAW) programme, a joint venture of the State University of New York at Albany and the New York State Education Department (NYSED). Participants needed a variety of information for home, work, and school. The internet (and NYSED intranet) was used as the primary source of information for work and school and often for home as well. People were the next most used sources of information. The information literacy course taught participants the skills needed to find information effectively and efficiently on the Internet and in an academic library. Students gained confidence as searchers and as students from the course.

**Bunyan and Lutz (1991)** reported that majority of the nurses in the hospital library consulted another person to meet their information needs which clearly indicated the lack of searching skills among the nurses in the hospital.
Callinan (2005) examines students' awareness and use of different sources of information for their course-work, their use of the (E-) library, why they visit the university library, the type of assistance they had received in using the library as well as the type of instruction they would like to receive in the future and also to understand what differences exist between first year biology and final year biochemistry students in University College Dublin so that measures can be taken to address those needs. A questionnaire was designed and administered to both sample groups to investigate the Information-seeking behaviour of these students in different years of their studies. The study highlights the positive aspects of seeking information from the students' perspective as well as the barriers they encountered when seeking course-related information. The findings show that there are differences to the extent wherein sources of information are used by students in different years of their studies. Apart from web sites and web-based lecture notes, lack of awareness is the primary reason why undergraduate biology students do not use the library's electronic databases. The study does not distinguish between third and fourth year students in the final year sample. One of the key recommendations is that bibliographic instruction should meet the specific information needs of first year biology and final year biochemistry students as well as greater liaison between faculty and librarians in the area of collection development and information literacy. It establishes the importance of a cross-sectional study in understanding the difference in students' information needs in different years of their studies.
Case et al., (2005) review the recent literature including searches of the MEDLINE, PsychInfo and CINAHL databases between 1992 and summer of 2004 and selective, manual searches of earlier literature. The assumption that individuals actively seek information underlies much of psychological theory and communication practice, as well as most models of the Information-seeking process. However, much research has also noted that sometimes people avoid information, if paying attention to it will cause mental discomfort or dissonance. Cancer information in general and genetic screening for cancer in particular are discussed as examples to illustrate this pattern. That some patients avoid knowledge of imminent disease makes avoidance behaviour an important area for social and psychological research, particularly with regard to genetic testing.

Challener (1999) investigated artists and art historians teaching in five liberal arts colleges and three universities. Results found that they need information for teaching. Almost all the participants almost all subscribe to art journals, and many read newspapers. They visit libraries frequently, usually more than one library, and unlike previous reports, a majority of them are willing to ask the librarian for help. A large percentage of both art historians and artists use computers for teaching. All 27 participants used slides extensively in the classroom, supplemented in most cases by textbooks.

Dee and Stanley (2005) carried out a study to provide new insights on clinical nurses’ and nursing students’ current use of health resources and libraries and deterrents to their retrieval of electronic clinical information. Questionnaires, interviews, and observation methods were used to collect data from twenty five nursing students and twenty five clinical nurses.
Nursing students and clinical nurses were most likely to rely on colleagues and books for medical information, while other resources they frequently cited included personal digital assistants, electronic periodicals and books, and drug representatives. Significantly more nursing students than clinical nurses used online databases, including CINAHL and PubMed, to locate health information. Nursing students made more use of all available resources and were better trained than clinical nurses, but both groups lacked database-searching skills. Participants were eager for more patient care information, more database training, and better computer skills; therefore, health sciences librarians have the opportunity to meet the nurses' information needs and improve nurses' clinical Information-seeking behaviour.

**Fidzani (1998)** conducted a study in University of Botswana, Gaborone, to establish the information needs and Information-seeking behaviour of graduate students. Findings include that there was a heavy reliance on library books, textbooks and journals as sources of information used for course-work. The researcher reported further that students primarily relied on scanning the shelves, or browsing through journals rather using the index and abstract databases to locate information. Relevant to this finding

**Frank (1988)** discussed the introduction of teaching of literature search in the Budapest Technical University, and this university was the first to start the teaching of literature search in 1958 and made it compulsory subject at faculties in view of its importance to obtain relevant information.
Fulton, Kerins, and Madden (2004) report the results of two empirical studies which explored the Information-seeking behaviour of engineering and law students in Ireland. The findings reveal similar patterns in the Information-seeking behaviour between students studying to become professionals and Information-seeking patterns of these groups. Students learned their Information-seeking strategies, including effective and less effective approaches, from educators. Misperceptions of the role and value of libraries and information professionals in their studies were common, and as a result, students often adopted Information-seeking strategies that excluded libraries and library staff. The two studies suggest that engineering and law students in Ireland could benefit from greater information literacy training and awareness, enabling them to acquire the information skills they need to function effectively and efficiently in their future professional work lives.

Gross (2005) suggests that people who function at a low level of skill lack the Meta-cognitive ability to recognize their own incompetence and are unable to accurately assess the skill levels of others. Therefore, they tend to overestimate their own abilities and proceed with confidence as they develop awkward strategies and make poor decisions. Worse still, because the incompetent do not know they are incompetent, they may be unlikely to seek training or skill-remediation services. This reviews competency theory and outlines how this theoretical perspective may allow for a new approach to research and practice in the area of information literacy instruction.

Hanson (1964) revealed that 24% of the scientists in atomic energy in UK undertake information searching on their own.
Hartmann (2001) concluded that undergraduate students experienced difficulty in locating items from the library collection and did not understand the processes for retrieving journal articles.

Heinstrom (2005) explored the information behaviour from a psychological perspective by relating Information-seeking to personality traits and study approaches. The research design was quantitative and consisted of statistical analysis of three questionnaires, i.e. the NEO Five-Factor Inventory measuring personality, the ASSIST test measuring approaches to studying, and a questionnaire regarding information behaviour. A total of 305 university students who were in the process of writing a Master's thesis responded to the questionnaires. Three Information-seeking patterns - fast surfing, broad scanning and deep diving emerged from the statistical analyses. Fast surfing could be related to a surface study approach and emotionality, as well as to low openness to experience and low conscientiousness. Broad scanning was linked to extraversion, openness, and competitiveness whereas deep diving was a search pattern typical of analytical students with a deep and strategic study approach. The results are based on descriptions of behaviour, not actual observations. Although the statistical results were significant, general conclusions would have required more convincing figures. Further research is recommended in order to explore the three search styles in other populations and contexts.

Herner and Dewitt (1954) found that one-fifth of the population studied visited the library very often to do their own literature searching.
Hogg and Smith (1959), found that 66% of scientists working in atomic energy establishments delegated literature search sometimes.

Jeong (2004) found that, Everyday Life Information-Seeking (ELIS) is a relatively new branch of user studies that examines information behaviour in daily life activities. In this study, as an example of ELIS, Korean graduate students' everyday lives in the United States are explored, focusing on their perspectives with respect to main stream society and the role of their ethnic church in their everyday lives. This study combines the grounded theory method with in-depth interviews of eight students and their spouses, as well as participant observation and informal interactions with others. The findings showed two dissimilation mechanisms in the typical Korean student's Information-seeking behaviour: language barrier and the strong bonds in their ethnic church. Their limited English prevents them from interacting with American society, and the students gather within the ethnic community in settings such as the Korean church; for the receipt of information for their ELIS and for social comfort. However, the church maintains strong ethnic bonds with the students by monitoring them and impeding their assimilation into American society.

Johnson et al., (2006) distributed a battery of three questions based on respondent's unaided recall of the sources they would consult for information on inherited cancers, a particularly rich Information-seeking problem. These operationalizations are then analyzed in a nomological network of related concepts drawn from an omnibus survey of 882 adults. The results indicated four clusters for fields and 16 different pathways, indicating increased fragmentation of information environments, with
different underlying logics and active ingredients, although the use of the Internet appears to be an emerging common theme. The analysis of the nomological network suggests that both approaches may have applications for particular problems. In the implications, we compare and contrast these approaches, discussing their significance for future methodological, analytical, and theoretical developments.

Kenney's (1966) study conducted at International Labour Office found that the rank order of approaches of users was by subject headings, personal authors and title.

Lee, Theng, and Goh (2005) propose a conceptual framework for creative Information-seeking; drawing upon Weisberg's argument that creativity exists in everyone, and mapping the creative process described in the holistic model of creativity to the Information-seeking activities identified in the behavioural model of Information-seeking. Using scenarios of Information-seeking behaviour, mappings between the creative process and Information-seeking activities were refined and six stages for creative Information-seeking were proposed. Scenarios were also used to provide theoretical justifications for stages in creative Information-seeking. Evidence gathered from the scenarios seemed to indicate that the type of Information-seeking task may have an impact on the extent to which an information seeker exhibits all stages in the framework.

Line (1971) found that, 72% of social scientist were not willing to delegate literature search at all.
Liu and Wu (2003) explores how intermediaries seek information from patrons, in particular by analyzing intermediaries' elicitation utterances through three dimensions - linguistic forms, utterance purposes and communicative functions - to determine whether indeed any dimension appears consistently, to be called elicitation styles. Five intermediaries from four academic libraries (three national university libraries, one private university library) and one research institute library participated in the study. Thirty patrons with 30 genuine search requests were recruited, thus, 30 patron/intermediary information retrieval interactions making a total of 30 encounters were collected. Video/audio data were taped. Dialogues between patron and intermediary were transcribed. Statistical analysis revealed three types of elicitation styles among the five intermediaries, labeled, (1) situationally oriented, (2) functionally oriented, and (3) stereotyped. This study seeks an explanation for different elicitation styles. Qualitative analysis was applied to investigate inquiring minds. An inquiring mind is termed to represent a mentality or tendency that one elicits certain threads of questions influenced by professional beliefs, individual characteristics, tasks, goals, and interactional contexts in conversation. The results of qualitative analysis specified three modes of inquiring minds of the intermediaries, namely: (1) information problem detection, (2) query formulation process, and (3) database instructions.

Machovec (1984) opined that voice recognition systems for on-line literature searching will make it much easier for intermediaries and users to interrogate with on-line information utilities without having to type.
Majid and Ali (2002) studied the use of information resources by computer engineering students in Singapore and found that the top five information resources in order of preference were books,(94%), Lecturers (84%), the internet( 86%), and friends (84%). They relied heavily on printed sources of information and their use of electronic journals and databases was very low.

Mayfield and Thomas (2005) study examines Information-seeking by the faculty of two social science departments (Social Work and Family and Consumer Sciences) of a large urban public university. The goal of the study was to better address faculty information needs in an unpleasant budgetary climate. To ascertain the impact of technology in the manner faculty gather information, the survey included questions about the relative importance of ten different information sources from library print and electronic sources to the Internet.

Mostert and Ocholla (2005) found that parliamentarians have an incessant need for timely, authoritative, and current information because of the enormous social responsibility bestowed on them by the electorates or society. A strong information accessibility that empowers them to fulfil this responsibility effectively is therefore very significant. Essentially and traditionally, parliamentary libraries are expected to provide legislators with most of the information they need. The study’s aim was to determine the information sources, service and systems used in South Africa by the parliamentarians, and also to investigate the role of the parliamentary libraries in the information provision process. A survey was conducted by use of questionnaires targeting all parliamentarians in South Africa and a
response rate of 23% (167) was received. This study has revealed that parliamentary libraries are underutilized because parliamentarians use other equally competing information sources largely accessed through the internet. Further, South Africa has enormous information sources and services that legislators can access and exploit and the use of electronic sources of information is growing rapidly, almost reaching the level of use of print sources. Unexpectedly, oral sources of information are used less. Parliamentary libraries have the potential to offer a variety of services to parliamentarians, yet they are not well-utilized, perhaps because of reasons such as poor marketing and innovative information services. Wilson's model on Information-seeking has been extended by a new model proposing and explaining Information-seeking strategies popular to parliamentarians in South Africa.

Nettlefold (1975) explained the need for students to receive instruction in the use of information sources for undergraduate biologists at Parsley College of Technology and as a result, literature searching course was introduced.

Osiobe (1988) found that browsing was the most important source of finding references for undergraduate students. He concluded that respondents in the University of Botswana did seek help from University library staff with 40% receiving help from the reference librarian and approximately 32% from the subject librarian.

Patitungkho and Deshpande (2005) report the results of a study of the Information-seeking behaviour of faculty members of Rajabhat Universities in Bangkok, Thailand. Data was collected by using a
questionnaire from seven faculty in Rajabhat Universities. Results show that most of respondents (41%) stated their method of seeking information by consulting a knowledgeable person in the field. Two hundred and thirteen respondents (82%) seek information for preparing lectures. It is revealed that most of the faculty members (57%) used textbooks. Seventy four per cent of respondents read information materials in Thai and twenty four percent read materials in English. The internet had been almost universally adopted. They trace materials from the library via the internet. Google.com was used for searching information by respondents. They use e-mail frequently for communication. It is found that 42% of respondents use the ERIC (Education Resources Information Centre) database. A majority of the respondents faced the common problem of unavailability of information while seeking it.

Reneker (1992) investigated the Information-seeking activities of 31 members of the Stanford University academic community. They were examined over a two-week period during the 1990-91 academic year. She adopted the naturalistic approach and employed qualitative techniques for the data collection using mainly personal interviews. Informants' perception of their information environment is expressed in positive terms, and there is a close relationship between knowledge of the information environment and the sources used. Information-seeking is embedded in the day-to-day activities and relationships of the participants and is triggered both by the articulation of need and availability of information. A large number of needs are satisfied by sources the informants created or organized for themselves.
and by interpersonal information sources. The findings of the study indicated that the action of Information-seeking originated from a wide variety of needs like personal, professional, entertainment, etc.

Rokitskaya (1975) observed that the present techniques and strategy of literature searching were found inadequate due to lack of stability of the reference system and bibliographical tools.

Scott (1960) found that 29% of the technologists working in the electricity industry undertake literature searching on their own, while 58% plus another 6% partially willing to delegate information searching to 31 library staff.

Seamans (2001) study reported that first year undergraduate students reported that all of the participants felt that they had little need to look for information besides what the faculty provided them during their course.

Shenton (2004) revealed that effective information skills are a prerequisite for young people in today's society, relatively little is known about how youngsters actually find information. The existing knowledge base on the subject is scanty and piecemeal, and few efforts have been made to explore, as an entirety, studies of young people's information-seeking and to isolate the methods, perspectives and strategies that researchers have adopted. Examination of these areas can alert prospective investigators to issues that they should explore and approaches that they might wish to take in their own work.
Shokeen and Kushik (2002) studied about Information-seeking behaviour of social scientists working in the universities located in Haryana. They reported that most of the social scientists visited the library daily. The preferred method of searching for the required information by the social scientists is by searching through indexing and abstracting periodicals, and citations in articles respectively. The social scientists use current journals followed by books.

Song's (2004) investigates Information-seeking behaviour of one particular segment of international students - international students seeking degrees in the field of business at the University of Illinois at Urbana-Champaign. The survey was designed to compare their perceptions of library services and Information-seeking behaviours. This study focused on three aspects of how domestic and international business students to assess the effectiveness of library instruction sessions; how domestic and international business students use library services; and use the Internet for their research. The survey results offer insights into understanding different perceptions of these two student groups with respect to their library use patterns and research strategies.

Sridhar (1986) study on use of card catalogue in a special library found that space technologists preferred to search under subject than the personal author and title.

Suriya, Sangeetha and Nambi (2004) carried out a research work on 'Information-seeking behaviour of Faculty Members from Government Arts Colleges in Cuddalore District'. The purpose of their study was to investigate
how faculty members seek information from the library. It mentions that most of the respondents 61 (38.12%) visited the library several times a week to meet their information needs. Regarding the type of search made by the respondents the majority of them 91 (56.87%) made their search by subject.

**Thivant (2005)** deals with the Information-seeking and use problem in a professional context and understands how activity can influence practices, by taking as examples, the research undertaken by economic analysts. He analysed the relationship between the situational approach, described by Cheuk, the work environment complexity with social, technological and personal aspects and the Information-seeking and use strategies, which relied on Ellis and Wilson's model. He interviewed eight economists, using a questionnaire and the SICIA (Situation, Complexity and Information Activity) method, which is a qualitative approach that underlines the relationship between situations, professional contexts and strategies. Both methods allow better understanding of how investment analysts find out what they need for their job. A qualitative mode of analysis was used to interpret the interviewees' comments, within the research framework adopted. The results find similarity in Information-seeking and use strategies used by these two groups and environmental levels meet in most situations. But some differences can be also found, explained by the activity frameworks and goals. This study demonstrates that the activity and also the professional context can directly influence practices.

**Urquhart and Crane (1994)** found that one-third of the nurses appeared lacking in Information-seeking skills.
Vegh (1988) advocated the need for the library staff to teach search techniques to researchers and students as an integral part of their university courses.

Wessel, Tannery and Epstein (2006) revealed that the Health Sciences Library System, Pittsburgh University, conducted a survey of clinical research coordinators at the Pittsburgh University and the Pittsburgh University Medical Centre to solicit their perceived use and knowledge of the library's electronic resources. The Pittsburgh University Institutional Review Board (IRB) is a high volume IRB that monitors human subject research at both the University of Pittsburgh and the University of Pittsburgh Medical Centre. More than 3,500 human research studies and clinical trials are active at any given time. Many studies entail more than minimal risk to human subjects, with the majority evaluating or including a drug or medical device. Clinical research coordinators are involved in most of these studies or trials. Their roles and responsibilities focus on managing many aspects of the study or clinical trial. As a first step in understanding the literature searching experiences and skills of these research coordinators, baseline data was gathered from this group in November 2004. The data from this survey indicate that clinical research coordinators are a population who would benefit from training by academic medical centre librarians in how to use electronic library resources and services. A Web-based survey solicited participants' information (gender, education, job title) and role in the IRB process (job responsibilities, number studies they manage). The majority of the survey questions focused on the use of specific electronic library
resources, the type of information wanted, and the types of problems encountered.

**Wu (2005)** explores the following research questions: (1) what are the purposes of patron elicitations? (2) When does the patron's elicitation tend to occur? (3) Do patron elicitations differ from intermediary elicitations in terms of frequency of occurrence and time frame? (4) Does patron elicitation behaviour relate to contextual variables, such as gender, age, status, knowledge, prior online search experience, individual intermediaries interacted with, or length of interaction? Qualitative and quantitative approaches including discourse analysis, content analysis and statistical analysis are applied. The major research findings include: (1) patrons' and intermediaries' elicitation behaviours differ in terms of frequency and time frame, supporting the prior assumption that intermediary elicitation is pre-planned and patron elicitation is situational; (2) patrons' perplexity is situational, being in most cases search-assignment related, and (3) patrons' elicitation behaviour is significantly related to their contextual variables. The study suggests dynamic user modeling to take account of the patron's MLIS.

### 3.2.3 Problems in Information Searching

**Bechtel (1990)** found that non-existent syntactical links between search terms, synonyms and abbreviations will increase the problems of free text searching in large data bases. Searching by uncontrolled terms is time-consuming and in most cases not very effective and discusses various examples, particularly with regard to the Chemical Abstracts data bases, and the pricing policy of Chemical Abstracts Service.
Belkin, N. J. Oddy, R. N. and Brooks H. M. (1982) state in their Anomalous States of Knowledge (ASK) hypothesis, which links the users, ASK to a relevant document set via a common code based on structural facets. In the present study an interoperable structural code based on eight essay styles have been created, and also notions of structural facets compatible with a high-impact essay structure are presented. The important findings of the study are: (a) the undergraduates’ topic statements and terms derived from it do not constitute an effective information need statement because for most of the subjects in the study the topic terms conformed to a low-impact essay style; (b) essay style is an effective interoperable structural code flowcharting the evolution of the undergraduate's knowledge state from ASK to partial resolution of the ASK in an information need statement.

Carey (1984) designed a questionnaire to gather information on citation elements as to how patrons locate magazines in the library, and use the university’s periodicals holdings list. The focus throughout the study was on the patterns and problems of periodical literature searching and on the kinds of indices that patrons use, ranging from general to specialized. The study, although done at a particular institution, is generally descriptive and should be useful to librarians in a variety of settings.

Cole et al., (2005) present a study of the real-life information needs of fifty nine McGill University undergraduates researching essay topics for either a history or psychology course, interviewed just after they had selected their essay topic. The interview's purpose was to transform the undergraduate's query from general topic terms, based on vague conceptions of their essay topic, to an information need-based query.
DeHart and Scott (1993) highlight the problem of level of specificity in multi-file searching possible from an Online Public Access Catalogue (OPAC). Emphasis is on classification codes as access points in searches on mathematical topics and postulates that users may identify Library of Congress numbers on desired mathematical topics through an OPAC search. They might then proceed to access appropriate Mathematics Subject Classification (MSC) codes in sub-files of the Dialog MathSci database to identify additional material. It also discusses how the problem in the level of specificity in multi-file OPAC searching might be alleviated.

Isao (1987) in manual searching, browsing reveals synonyms and related words and the search can be modified accordingly, but this cannot occur in on-line searching. Medical Subject Headings (MeSH) form a controlled vocabulary for searching MEDLINE. MeSH gives the term 'Acute Yellow Atrophy' (AYA) for the Japanese 'gekitsu kan'en' which is usually translated as fulminant hepatitis. A MEDLINE search gave only seven hits for AYA but 220 hits when 'fulminant hepatitis' was used. It appears that AYA is a pathological term and a survey of Index Medicus showed it appeared only 4 times between 1978 and 1987. It is suggested that 'fulminant hepatitis' is used instead. This example shows the problems for librarians without specialist knowledge relying on MeSH for search terms.

Leppanen (1996) found that homonymy is known to often cause false drops in free text searching in a full text database. The problem is quite common and difficult to avoid in Finnish, but nobody has examined it before. Reports on a study that examined the frequency of, and solutions to, the homonymy problem, based on searches made in a Finnish full text database
containing about 55,000 newspaper articles. The results indicate that homonymy is not a very serious problem in full text searching, with only about one search result set out of four containing false drops caused by homonymy. Several other reasons for non-relevance were much more common. However, in some set results there were a considerable number of homonymy errors, so the problem seems to be very random. A study was also made into whether homonyms can be disambiguated by syntactic analysis. The result was that 75.2 per cent of homonyms were disambiguated by this method. Verb homonyms were considerably easier to disambiguate than substantives. Although homonymy is not a very big problem it could perhaps easily be eliminated if there was a suitable syntactic analyzer in the IR system.

MacKenzie (2000) argues that, with long experience in managing traditional records and a range of theoretical skills combined with practical expertise, archivists are well placed to make a significant contribution to policies for dealing with electronic records. Further, the study describes some of the international and national initiatives that demonstrate the problems of control to be solved through co-operative efforts. The study cautions that problems should not be seen as exclusively technical matters for computer experts and that long-term solution for electronic records are a problem for the future.

Markusova et al., (1988) examines questions of scientific measurement analysis for networks citing publications on the catalysis of nuclear reaction synthesis, based upon the use of the machine readable data base SCI-SEARCH, a search name within DATA-STAR-SCIN for 1984
and 86. The printed SCI edition for 1980 and 84 was used to study development tendencies in the flow of publications on this topic. It also identifies the dynamics of increased distribution of publications within the SCIN data base, including a calculation of the PRAIS index for 1984 and 1986.

**Minchow (1996)** notes the growing trend towards problem based learning in medical schools in the USA, principally because its central tenets are seen to promote problem solving skills. California University at Irvine, College of Medicine, has implemented a sequence of problem based learning courses with a concomitant sequence of information management instruction and reports a description of the Patient-Doctor two course in the second year curriculum with its information management component. Instruction is provided throughout the year and an assessment of the impact of the changes indicates significant advances in skill development. The patterns of Information-seeking behaviour by future physicians are expected to change dramatically as medical students learn the value of information management skills and their positive impact on clinical problem solving as demonstrated through a problem based learning curriculum.

**Obata (1999)** reports that PubMed is the medical information retrieval system that the American National Library of Medicine provides on the Internet, 24 hours a day without charge. Users can choose the most appropriate method for each search: basic, advanced, Boolean, etc. To obtain good search results, it is necessary to understand the mechanisms of Automatic Term Mapping (ATM), MeSH translation, etc.
Reneker (1993) the Information-seeking activities of thirty one members of the Stanford University academic community were examined over two week periods, in which 2,050 Information-seeking incidents being tape recorded and supplemented by interviews. Qualitative and quantitative analysis was used to examine the information needs in relation to perceived environment, source use, personal characteristics, and satisfaction with the result of Information-seeking. Results revealed Information-seeking to be embedded in day to day tasks and relationships; and triggered both by articulation of need and availability of information. It also describes the methodological approach adopted and the use of the ETHNOGRAPH and SPSS/PC Plus software to facilitate data analysis.

Schilling et al., (1995) recent trends in medical education include a shift from the traditional, didactic, lecture orientated approach to a more student driven, and problem based approach. This trend provides librarians with an opportunity to develop programmes to teach information gathering skills that support and are integrated into Problem Based Learning (PBL). In 1992, Pittsburgh University, School of Medicine implemented the initial phase of a curriculum revision that emphasizes PBL. Since that time, Falk Library of the Health Sciences, Pittsburgh University, has provided a large scale, intensive programme integrating Information-seeking skills and activities into the first year Patient-Doctor Relationship course, a sequence that initiates medical school. The Falk Library programme emphasizes the gathering and use of information as central to both PBL and student skills development and presents an evaluation of the results of this programme,
including data on the use of information sources and services, and student perceptions of the librarian's role in the PBL sessions.

**Shuman (1982)** conducted an experiment, which was constructed to determine how student searchers, undertaking the same bibliographic problem in both the on-line and print-source methods, experienced differing results, and differing perceptions of the process, despite the identical objective. Twenty-five graduate students taking the author's data base reference course were given the task of preparing bibliographies on related subjects using DIALOG's on-line system and any library or libraries of choice, for the conventional search. They were permitted to choose their topic-pairs, and rules as few as possible were imposed by the instructor. Searchers were asked to record their searching costs, time spent, effort, results, satisfaction, and psychological reactions to the two methods of searching, and to note in detail comparisons, contrasts, and preferences. The result shows that two-thirds majority prefer automated searching, although both methods offer unique opportunities and problems. It is mildly surprising to find that, after tasks are broken down, it is slightly more expensive to search manually than it is to do so on-line, where output is more conveniently gathered and assembled.

**Sridhar (2004)** draws on data from a comparative study of use of the online public access catalogue (OPAC) and the card catalogue of the ISRO Satellite Centre (ISAC) library, and examines the steady decline in the use of subject searching by end-users and the associated problems and issues. It presents data to highlight the negligible use of Boolean operators and combination searches, variations in descriptors assigned to books of the
same class numbers, and too many records tagged to very broad descriptors. The study concludes that moving from a traditional card catalogue to a modern OPAC has not made subject searching more attractive or effective.

**Stavri (1996)** reports results of a study designed to explore the relationship between certain attributes of a diagnostic problem and a particular Information-seeking question. Fifty doctors in internal medicine and family practice informed the experimenter of the most important thing they would need to know to make a preliminary diagnosis. The data was classified nominally using a pre-existing taxonomy. Results indicated that quantification questions tend to be asked under urgent conditions and verification questions tend to be asked when the least amount of information is presented.

**Subramanyam (1983)** found that in most developing countries facilities do not exist for online searching of databases and the 2 key issues that influence the implementation of on-line searching facilities in developing countries pertain to information infrastructure and appropriate technology. The elements of an information infrastructure that are essential for the successful implementation of on-line searching systems in developing countries are designed and described. Problems encountered in the direct transfer of sophisticated information technology developed in industrial countries to developing countries are discussed in the light of socio-cultural dimensions of technology. Criteria for appropriate information and appropriate information technology are delineated. Action imperatives for
alleviating problems of information infrastructure and appropriateness of information technology are presented.

**Swigger and Hartness (1996)** develop a computer supported cooperative problem solving environment which aims to help librarians and remote users work together in performing an online search. It encourages cooperative work, and monitors both individual and group performance. Groups using the interface demonstrated more effective skills than groups that performed the same task face-to-face. Competencies relating to group problem description and generation of alternative solutions were the most predictive of successful group interaction.

The Godin project is a result of four years' attempt to improve teaching of searching at Roskilde University Centre's natural science course. The intention is to make the teaching, problem-based and develop methods which can be used elsewhere. The course has four parts of two and a half an hour each. Evaluation has established the objection to problem-based teaching, that students learn to consider method choose search tools and improve searching, but not to use a library catalogue, is not justified.

The newer studies about Information-seeking behaviour of social sciences, humanities and sciences incorporate the older research and provide more relevance to Information-seeking behaviour in the electronic information environment. More recent studies show an increase in the use of electronic resources. A review of literature revealed the lack of in-depth studies relating to the use of information sources and searching habits of scientists at the national level in different environments in India.
Tousignaut (1982) examines some of the differences between the terms 'pharmacy' and 'medicine', specifically in terms of their relationship to medical, pharmacy and pharmaceutical literature. It illustrates the problems that not understanding these differences can cause when selecting a database to search and in terms of information retrieved as a result of ambiguous information indexed from the primary journal literature.

Tuominen (1992) interviewed twenty workers employed by Nokia Mobile Phones Ltd dealing with needs and seeking health information: the kind of information needed and problems encountered in using the acquired information. The contents of the interviews were analyzed making use of the sense-making theory of information behaviour. It suggests that a collection of similar qualitative studies in different environments would provide a basis for the development of theoretical models explaining information behaviour.

Ueda (1999) reports the results of a user survey of fifteen WWW online public access catalogues (OPAC) systems in university libraries in Japan using terms that would most likely be used by novices and analyzes three cases, each searching a specific book or author from terms extracted from them and their variants, and outlines problems that are likely to occur in each of the three studies. The study emphasizes on the basis of the findings, that it is necessary to develop an original architecture and standard searching procedure for OPACs based on a new user model.

Urquhart (1999) descriptive vignettes have been used to elicit attitudes or perceptions which might be more difficult to reveal using a more direct approach. It briefly reviews the use of vignettes in social sciences and
in the health sciences for both research and educational assessment and
discusses the analysis and interpretation of vignette studies with reference to
the findings of the Establishing the Value of Information to Nursing
Continuing Education (EVINCE) project.

Vakkari (1999) suggests that analyzing actions to be supported by
information and Information Retrieval (IR) systems is vital for understanding
the needs of different types of information, search strategies and relevant
assessments, in understanding IR. A necessary condition for this
understanding is to link results from Information-seeking studies to the body
of knowledge by IR studies. Focusing on tasks from the angle of problem
solving, the author analyses certain features of work tasks and relates these
features to types of information, people are looking for and using in their
tasks, patterning of search strategies for obtaining information and relevance
assessments in choosing retrieved documents. The major claim is that these
information activities are systematically connected to task complexity and
structure of the problem at hand.

Weisgerber (1993) reports form the ICSTI Group on a project to
identify, and describe problems of interdisciplinary searching and to propose
remedies and solutions. The project gathered the relevant information
through a questionnaire addressed to database builders, online system
vendors, search intermediaries and end users; analyzed and organized the
input and presented a report. Six categories of problems were discussed:
coverage and technical content of the database, bibliographic information
textual content, numeric data, file organization and interdisciplinary
searching on multiple hosts.
Wildemuth et al., (1995) focus on the relationship between personal knowledge in a domain and searching proficiency in that domain, and the relationship between searching proficiency and database assisted problem solving performance. On four assessment occasions over a two year period, thirty six medical students solved problems in three biomedical domains (bacteriology, pharmacology, and toxicology) with and without assistance from a factual database in the relevant domain. There was little evidence of any relationship between personal domain knowledge and searching proficiency i.e. search results, selection of search terms, improvement in selection of search terms over the course of the search, and efficiency. Search results, selection of search terms, and efficiency were found to be related to database assisted problem solving performance.

Williams (1986) revealed that the number of institutions providing end user search services are increasing in the U.S. Major factors directly responsible for this trend are: improvements in vendor services, development of end user oriented software, and the rapid increase in the use of personal computers. However, various reports indicate that a significant amount of time needs to be spent on user education to assure good search results, and that the role of the searcher/intermediary is changing. Problems associated with end user searching are numerous and concern vendors, hardware, software, and users. Despite these problems, end user search service is being recognised as part of regular library functions. The development of such integrated systems is presently being attempted at the University of Illinois at Urbana-Champaign.