

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Library Philosophy and Practice (e-journal)

Libraries at University of Nebraska-Lincoln

5-25-2013

LIBRARY RESOURCES, SERVICES AND INFORMATION SEEKING BEHAVIOUR IN CHANGING ICT ENVIRONMENT: A LITERATURE REVIEW

Jayadev H. Kadli, Librarian

Lala Lajpatrai College of Commerce & Economics, Mahalaxmi, Mumbai - 34, jhkadli@gmail.com

B. D. Kumbar, Professor & Chairman

Dept. of Library and Information Science, Karnatak University, Dharwad - 580 003, bdkumbar@yahoo.com

Follow this and additional works at: <http://digitalcommons.unl.edu/libphilprac>



Part of the [Library and Information Science Commons](#)

Kadli,, Jayadev H. Librarian and Kumbar,, B. D. Professor & Chairman, "LIBRARY RESOURCES, SERVICES AND INFORMATION SEEKING BEHAVIOUR IN CHANGING ICT ENVIRONMENT: A LITERATURE REVIEW" (2013). *Library Philosophy and Practice (e-journal)*. 951.

<http://digitalcommons.unl.edu/libphilprac/951>

Library Resources, Services and Information Seeking Behaviour in Changing ICT Environment: A Literature Review

Dr. Jayadev H Kadli
Librarian, Lala Lajpatrai College of Commerce & Economics
Mumbai – 400034, INDIA

Dr. B. D. Kumbar
Professor & Chairman, Dept. of Library and Information Science
Karnatak University, Dharwad - 580 003, INDIA

Literature Review enables us to gain a comprehensive overview and summary of the available information on a particular topic. Literature reviews are generally more useful to all practitioners than any one individual piece of research because they allow one piece of research to be viewed within the wider context of others. We see in this article how and why literature reviews are such an essential tool for every researcher. The reasons of undertaking a literature review is also been introduced. Emphasis has been placed on the literature review of library resources, services and information seeking behavior w.r.t ICT environment. This literature review article helps to library, information science and behavioural science professionals. We have also discussed in this article about different approaches of literature review and how this review helps for researchers.

The literature on information seeking behavior has been, and remains, a hot topic for research within various disciplines, but has been limited to review in this article to the field of library and information science, which is where many of the key articles are to be found.

Key Words: Literature Review, Information Seeking Behaviour, Information Seeking Models, Library Resources, Library Services, Changing ICT Environment, Changing Information Environment.

1. INTRODUCTION

The review of relevant literature is nearly always a standard chapter of a thesis or dissertation. The review forms an important chapter in a thesis where its purpose is to provide the background to and justification for the research undertaken. It is not a chronological catalog of all of the sources, but an evaluation, integrating the previous research together, and also explaining how it integrates into the proposed research program.

Literature reviews help us to see the full picture and uncovering new evidence on relevant topic. It encourages objective thinking, and systematic approach to the research undertaken. A good literature review requires the ability to conduct exhaustive bibliographic searches, ability to organise the collected data meaningfully, describe, critique and relate each source to the subject, and present the organised review logically, and lastly also very important, to correctly cite all sources mentioned.

2. WHY LITERATURE REVIEW?

Many students are instructed, as part of their research program, to perform a literature review, Most are aware that it is a process of gathering information from various sources and

documenting it. A literature review is a critical and in depth evaluation of previous research. It is a summary and synopsis of a particular area of research, allowing anybody reading the paper to establish why you are pursuing this particular research program.

There are many reasons why we conduct a literature review. Few are as follows:

- To ensure thorough understanding of the topic
- To identify potential areas for research
- To identify similar work done within the area
- Identifying knowledge gaps that demand further investigation
- To compare previous findings
- To evaluate existing findings and suggest further studies.
- To demonstrate that you can access previous work in an area
- To identify information and ideas that may be relevant to your project
- To identify methods that could be relevant to your project

3. DIFFERENT APPROACHES OF LITERATURE REVIEW

It is important to note that certain disciplines will have a different approach to literature reviews. The university department may have particular preferences so one should always make sure that you have consulted your research guide / supervisor before you start work.

- **Science and engineering** have fairly rigid conventions for reporting on research. They can have a specific structure e.g. “introduction”, “background” followed by “methodology” “results” and “discussion”. This is known as an explicit literature review.
- **Social science** literature reviews often follow a similar pattern to science and engineering literature reviews although some social sciences e.g. anthropology may have a less explicit approach.
- **Political science** literature reviews may have to include a section which establishes basic premises and has definitions of certain terms and models.
- **Literary and historical literature** reviews do not have a single convention. In contemporary literary studies an “explicit” chapter may not be needed. The researcher may be taking a new theoretical approach to material which has already been studied before.

4. REVIEW OF LITERATURE ON LIBRARY RESOURCES, SERVICES AND INFORMATION SEEKING BEHAVIOUR IN CHANGING ICT ENVIRONMENT

This review of literature section is segmented in to four different concepts namely,

- 1.Changing Information Environment;
- 2.Library Resources and Services in ICT Environment;
- 3.Information Seeking Behaviour (ISB);
- 4.Models of Information Seeking Behaviour.

4.1 Changing Information Environment

Electronic networks and different information formats are changing information access operations worldwide. Morrison and Stein (1999) discuss the role of the Universities and Colleges in preparing students to handle the rapidly expanding range of information formats. Information and knowledge are the high-value tools of the present age. The rise of the Internet has led to 'free information services'. Lennon (1999) looks at how 'free' information really is and whether we can continue to expect high-quality information to be available without cost using the Internet. Explaining what hybrid library is Garrod (1999) explains that the academic libraries and library staff need to adapt swiftly to the new learning environment. Similar view is expressed by Logue and Preece (1999).

There have been several articles which have tried to predict the way information age will evolve. In one such attempt, Scammell (2000) looks about the future of information. The changing information format and the access mode is the crux of the issue in this information age. Similar thoughts about the innovations and the future of information management are expressed by Kunneke and Terblanche (2000), Wood and Walther (2000), Stickley (2000) and Brophy (2000).

Impact of ICT and social exclusion in this information society is expressed by Dutch and Muddiman (2000). Stover (2000) conducted a qualitative survey to find patterns and themes among librarians in regard to their attitudes toward managing technology and the technological change. New Information and Communication Technologies are transforming Scholarly Communication. Lally (2001) argues that researchers and research intermediaries need to find new ways of working together in order to understand and take full advantage of the emerging forms and media for scholarly communication. Discussing about the future of the academic libraries, Akeroyd (2001), touches upon ICT innovations and its impact on all the components of the library systems.

The digital era has revolutionized the methods for the organization and automated handling of information. The web documents are significantly different from traditional versions in their presentation and also the ways to organize and retrieve them. Ghiselli and Padula (2001) propose the integration of tools to provide unified access to remote and heterogeneous archives, the contents of which can be grouped under the same subject, and which have been integrated to allow the user to navigate and conduct the thematic searches.

Revill (2002) reviews with the comments on Information and Communications Technology-mediated learning. Fors and Moreno (2002) assessed the compatibility between the implementation of information communication technologies (ICTs) strategies and the bottom-up approach in the developmental process. The authors discussed on the benefits and obstacles of implementing the ICTs strategies.

Veeranjaneyulu and Singh (2003) examine the impact of Information Technology (IT) on the academic libraries. Thinking deeply about changing academic environment, Rockman (2003) states that, libraries should plan ahead and take their services to where users require most rather than becoming too limited or denying users the chance to learn in modern environment using virtual reference service. Gaur (2003) argues that manpower is one of the three main components of reengineering process of library. He feels that the impact of the technology can be handled well if a well thought reengineering plan is in place for human resources. The similar thought is expressed by Tyckoson (2003) also.

The changing information environment is also marked by a rapidly changing information user. The search engine technology degraded over time by the rapid increase of web pages and the retrieval strategies has yielded poor results. Carlson (2003) explores the alternative retrieval strategy approaches including a demonstration of their best areas of application. Dalbello (2004) gave a thought on renaissance of cultural memory in a digital form. Anunobi and Okoye (2008) discuss the nature of academic libraries in the digital age including the print resources. The authors describe a conceptual model of resource access of academic libraries in developing countries.

A recent addition to the existing information formats is gaining fast popularity in the e-Books. Carlock and Perry (2008) made a study on a group of selected faculty to discover their perceptions and use of electronic books (e-books) in their research and teaching. This study revealed the advantages of e-Books over traditional print format books.

Kumar and Singh (2009) describe about the advancement of information communication technology (ICT) has ensured the application of Internet and other electronic resources i.e. CD-ROM, DVD-ROM etc. in the learning resource centre (LRC). The authors stress on the competencies of LRC staff to handle the problems associated with the use of computers. The above views also supported by Bansode, et al. (2009) and view that ICTs have allowed traditional LIS methods to be replaced by the newer, faster, and more accurate ways of transmitting information.

The changing format of resources is the challenge for the library in preserving and managing them. Pandey (2010) has touched on the Management and Preservation of Resources in digital libraries. The author also has covered the digital library and traditional library resources.

Electronic information services and the competencies required for providing them are defined in his study by Corbin (2011). The personal, basic, general, and special competencies that will be needed are described. Both how the competencies are acquired initially and how they will be maintained thereafter (as well as responsibilities for gaining and maintaining competencies) are also discussed.

The collection and management of digital resources dominated collection development and management literature. The mood of the literature was generally optimistic in light of the considerable challenges libraries faced in managing their resources to accommodate the rapidly growing and ever-shifting digital landscape. While looking back on the established philosophy of traditional collection activities, the authors Bullis and Smith (2011) moved decisively into the digital age and emerged with a positive vision of the future of library collections.

Information technology in combination with changes in organizational structures and methods of working has led to an increasing amount of information and also to totally new forms of information as well as in the creation of records. Asproth (2012) has studied some problem domains of long-term preservation and how ongoing research matches these domains is presented. It appears clear that although much of the challenges associated with digital preservation is strategic, organizational, and structural and not only technical, the research mainly concentrates on solving the technical issues.

Due to exponential growth in Information and Communication Technology (ICT), more and more information is available to scholars today, more quickly than ever before. The

development of digital technology and its applications in library and information centers, the concept of library management has been changed to information management and again in the 21 century, the entire scenario of information management has started its change in knowledge management. The challenges face special libraries that need nothing short of a paradigm shift of information services and an organizational transformation. Mandal, Podder, and Choudhuri (2012) in their study made an attempt to discuss the challenges for special libraries, importance of knowledge management and the role of library-information professionals, their possible contributions, vital competencies and skills unique to the 21 century if they want to survive in the digital era.

The study by Harris (2013) look at the concept of 'digital libraries', and the collections and services of digital libraries, in comparison to 'traditional libraries'. The brief history of the idea of digital libraries, and a discussion about digital library is explained. The remainder of their study report examines the differences between digital libraries and traditional libraries with regard collections and services offered.

The main differences come down to how the services are provided, and how collections are stored and managed.

Gakibayo, Ikoja-Odongo, and Okello-Obura (2013) assessed in their study on the utilization of electronic information resources in Mbarara University Library by students by addressing four objectives namely; identifying the availability e-resources in Mbarara University library, determining the extent of the relevance and use of e-resources in Mbarara University library and lastly proposes strategies to promote the usage of e-resources by students. The study found that utilization of e-resources was not only affected by lack of computer skills and information literacy skills but also lack of enough computers and slow internet connectivity. The frequency of use of these resources indicated that a lot need to be done to increase e-resource use.

4.2 Library Resources and Services in ICT Environment

The innovations in information communication technology have influenced libraries to serve better and adapt the changes. The libraries also changed drastically with service provision, collection development, human resource planning and training. The librarians also have changed their mind set towards service and the management of libraries.

One of the major developments in the libraries and information services in the last 10 years has been the introduction and spread of electronic information sources (EIS). The progress in information technology has offered today's information seekers different opportunities to access to information resources in an increasing array and format.

An academic library is expected to provide materials for courses, research projects and institutional academic activity to satisfy the needs of the well defined specialized clientele like faculty, students, researchers, administrators. Boakye (1994) explains about the academic libraries of developing countries and their services. He describes the document procurement methods and services.

The role of a librarian has changed due to the IT appearance in the educational system. Shimmon (1995) assesses the future of libraries and librarians regarding impact of Technology; and presents evidence for and against their decline. The library services always depend upon the involvement of a librarian in the service modules prepared for the system. Atton (1996) has found in his study that the information provision in the academic libraries depends on the librarian involvement and his interest in the services. This is the era of a constant changes; James (1996) discusses the social, national and local factors affecting higher education in the UK in relation to the development of the libraries, learning resources and information services. Hyams (1996) discusses the changes likely to take place in the information professional's role in the IT environment.

Boissonnas (1997) discuss in detail about the managing technical services in a changing environment, specifically touching the experience of Cornell University, New York. He reports the study made in Cornell University on technical services. In the changing Information Technology environment, the library can expand resource sharing efficiently by overcoming the traditional methods. Giving the example of the changing Ohio environment Kohl (1997) focuses on the issues in resource sharing and illustrated possible solutions with actual examples. Lynch (1997) talks on the changing role of the library in a networked information environment. He concentrates on the Authentication and Authorization services during the transition from stand alone computing to networked environments.

Prabha and Donnelley (1997) touched upon resource sharing in a changing environment. They explain how library can overcome the problems involved in the services. Mittal (1997) explains the changing role of the librarians in an electronic environment. He says today's librarians' responsibilities can be those of a system analyst, an information manger, a database manager, a network manager and as an intermediary. Klein and Ross (1997) describe how end user search services can become a force for an expanded information management and technology role for the librarians.

The information need demands current, comprehensive and cost effective devices, then one should have the correct mix of technologies, online and CD-ROM. The developments in information technology including computers and communications have led to this trend. Subba Rao (1997) outlines the information access through right mixture of technologies, namely online and CD-ROM.

In the current information environment of rapid change and technological innovation, planning library instruction Programmes are important which meet the needs of the students. Hammond and Mitchell (1997) made a report of library instruction Programme at an Arizona University. They focus on the library instruction Programme which helps users to find the information in a library. Schwartz (1997) in the introductory chapter of his edited book highlights on the restructuring of academic libraries and how the organization can develop with technological change.

Clegg and Carey (1997) summarize the practical work, examining the impact on the users of information technology. There have been efforts in the academic community to move from a paper-based classroom to a paperless classroom. Adams and Janson (1997) focus on the information technology and tell how it supports the model of learning in a particular situation. They mainly focus on how the information technology enhances learning.

Subba Rao (1998) gives the picture about CD publishing and its scenario in India. He highlights the features of CD-ROM as a choice medium for information storage and dissemination. He discusses the scenario of a CD-ROM industry in India while listing a few

Indian CD products. Weller (1998) examines how the librarians should expand their expertise into the area of instructional Programmes, improving access and advancing scientific information communication.

The increased cost and decreased funding has made the library directors in fund rising activity with the library services in USA. Martin (1998) discusses the role of the library's director and the role of other library staff in the development process of library in IT environment. Elliott (1998) discusses the Nashville Public Library experience on staff development for improved collection management in a rapidly changing and enhanced technological environment. The library-faculty collaboration in the developing library resources will make the students learning habits more success. Williams and Hunt (1998) reveal that the college library staff must work to bring the students and information technology together, especially where students are poor in information technology use.

Information and knowledge are the high-value tools of the present age. The rise of the Internet has led to the 'free information services'. Lennon (1999) looks at how 'free' information really is and whether we can continue to expect high-quality information to be available without cost using Internet.

Sun and Rader (1999) explain about the academic library user education particularly in China. He takes the example of Tsinghua University's library and how they built integrated library information system developed including CD-ROM online searching. Rieh (1999) gave a thought on the academic library reference services and examines the changes in IT environment based on the perspectives of managers, librarians and users. He proposes the directions to users' information searching process and librarians' interventions in reference service which are integrated. Davis (1999) talks about changing role of serial acquisitions librarians in the electronic environment. He reports on a discussion which took place at the American Library Association's 1999 Midwinter Meeting and the several key issues addressed. Garcha and Buttlar (1999) consider how the role of cataloguers has evolved over the past decade due to the impact of automation.

Logue and Preece (1999) explain how instructional support through web services help to meet the users need in the changing library environment. The electronic resources are more supportive these days and compliment the traditional resources and serve the library users efficiently. Stern and Connaway (1999) highlight the power of those electronic books which give traditional libraries to more effectively use their resources to serve their patron. Rowbotham (1999) in her article explores the reasons why librarians should be at the heart of Internet site development.

The Web, Internet and Intranets now make it possible for an individual unit or the teams within a company, research institute, or university department to offer their reports and documents in electronic form directly to outsiders without involving the library. Phelps (1999) looks at what can be done through a professional approach and vision to convince parent bodies of the benefits of involving the library if they care about the long term future of their publications. The Internet has become emerging technology for information generation and its services to users. Jha and Mishra (1999) describe the basic nature and functioning of the Internet and its practical potential for generating information and providing access to a wide range of information services from electronic mail and electronic publishing to World Wide Web. Shemberg (2000) searched the web sites of 125 academic libraries in USA to find out the information about the libraries.

As technology changes, so do methods for delivering electronic information resources to library users. Bordeianu, Carter and Dennis (2000) describe Web-based online public access catalogues (Web OPACs) and other web based tools as gateway methods for providing access to library collections. The innovations in ICT have made impact on every facet of library. How the future of academic libraries will be in this changing ICT environment is discussed by Wood and Walther (2000) with changing student population. They look at the depth of the information formats and changing delivery mode of information with the integration of technology in library. The library services are basically same in the traditional and electronic libraries. Brophy (2000) reviews the historical development of libraries and information services. He found out that the service offered in traditional and electronic libraries are same but only the way they serve is different.

The web sites for libraries are essential in today's environment. Web site supports library services in a better way. Designing web sites is a more important task depending on the type of the library. Balas (2000) discusses some of the issues involved in designing the Web sites for libraries, including: moving from print design to web design, the use of tools available online. Similar views are expressed by Jeevans (2000).

The Information Technology has made its impact on the academic library in recent years in India. The library services are redefined with changing Information Technology environment. Communication, resources sharing among other libraries become easy. Chopra and Mukherjee (2000) trace the need of networking among academic libraries by pointing out its basic targets. This article highlights the situation of networking among the academic libraries of Jabalpur, India, before and after 1995. Sridhar (2000) explains the purpose of modernization of library services through the introduction of information technology (IT) and indicates the unlimited potential of IT for modernizing the library services. Clyde (2000) explains how the computers could make changes in the library services: as an administrative tool, as a resource for teaching information skill; and as part of the library collection in the form of software and databases. Rockman (2001) emphasizes on e-library environment.

The recent advancements in technology have inspired the libraries to develop creatively customized services. Ghaphery, Kesselman and Watstein (2001) discussed about the personalized information clients' i.e. personalized information services. Akeroyd (2001) explores the future of academic libraries. He touches upon electronic changes its impact on all the components of library systems. Arte (2001) explains the experience of the National Research Council Library. The author expresses his view on the success of a library which depends on the role of a librarian and library staff in the successful implementation of the library services. The electronic resources and their management are very crucial in today's IT environment. Ashcroft and McIvor (2001) stress more on the electronic resources and their management. The authors suggest that the management of e-journals and easy and perfect access to them depends on how the library embraces the new technology and the skill developed by the library staff.

The digital era has revolutionized the methods for the organization and automated handling of information. The web documents are significantly different from the traditional versions in their presentation and also the ways to organize and retrieve them. Ghiselli and Padula (2001) propose the integration of the tools to provide an unified access to remote and heterogeneous archives, the contents of which can be grouped under the same subject, and which have been integrated to allow the user to navigate and conduct the thematic searches.

Covey (2002) identifies with survey how the students and the faculty perceive and use the entire information about the landscape. He identifies the inefficient and ineffective services of the academic library. The author instigates to develop the library guidelines, the best practices and the standard instruments to make the best academic library. Rockman (2002) in his editorial remark says that the users engage by transforming the way we think. He stresses on the campus portal development and use, and electronic course packs through electronic course delivery systems offering academic libraries active participation with their expertise. Knight (2002) explains about the role of assessment in the library user education.

The emergence of web technology has condensed the diversified and distributed world in a compact form creating the concept of global village. Koganuramath and Angadi (2002) have made a study of TISS library. They emphasize the need for the library home page. They elaborate the techniques of designing and developing a library home page. The authors also attempt to answer the structure and maintenance of web page for better services.

Thinking deeply about the future, Rockman (2003) puts forward that the libraries should have planned ahead and taken their services to where users require most rather than becoming too limited or denying users the chance to learn in modern environment using virtual reference service. Tyckoson (2003) discusses the relations between the librarians and readers of past and today. He looks on the future of reference service. Carlson (2003) explores the alternative retrieval strategy approaches including a demonstration of their best areas of application.

In the changing academic environment the libraries have to develop their electronic resources with the existing print sources. It is difficult with a limited budget to develop the electronic resources. Cholin and Karisiddappa (2004) highlight the consortia approach for the academic libraries as a remedy. Similarly, explaining the need of the hour Chakravarty and Singh (2005) highlights two major consortium initiatives, UGC-Infonet and INDEST – Consortium that have come to the rescue of the academic libraries so that they can cater to the needs of the academia. They conclude that the efforts of UGC-Infonet and INDEST - Consortium are appreciable and will definitely strengthen the higher education system in India through library services.

The information technology has a positive impact on all the library and information services like library resources to varied services rendered to users. Kanamadi (2005) in his thesis explains about reference service, CAS, OPAC, etc. Human resource is another aspect, which is influenced by the development in IT and its applications at libraries. Jange et al. (2006) made a study on the information sources and level of the satisfaction of users.

The reference service is one of the library's primary services besides acquisitions, classification, cataloguing and physical planning. Dollah (2006) has made an attempt to identify the usage of both traditional and digital reference services, user awareness of digital reference services, user satisfaction, and need for digital reference service. Ferreira (2007) stresses on the issue of open access digital repositories which are also on the top of the national and regional political agenda. Koufogiannakis (2007) presents a model which will map out a concrete model that can be used by any library to complement their collection-based decision making.

Modern academic libraries are conglomeration of printed books and journals as well as electronic resources (e-resources) where both forms of the documents can be stored, retrieved and delivered as when required. Sharma (2008) gives an idea to design an integrated common digital gateway and use of the same will be mandatory to all. Recently, Xiao (2008) made a valuable effort to make use of Web 2.0 technologies such as blog, tags, YouTube, RSS feeds,

Instant Messaging, online presentation etc. the author says that these web 2.0 technologies function as catalysts to lower the human barriers and experienced it with library users by reaching them virtually.

Sharma et al. (2009) discuss on the ICT based resources and services. The article illustrates the reflection of the available IT infrastructure and e-resources with the libraries. The study also highlights the management, control and retrieval of respective services and resources. Kumar et al. (2010) present the shifting of academic libraries from the traditional form to networked information services. The library can offer special services through the blogs. Like Xiao, Kumar et al. discuss on the blogs. They describe the types of blogs, Blogs for library. They speak on, how blogs can be used for extending the library services and support to dedicated users.

As libraries move their focus from print collections to digital resources residing in the “cloud”, the library-user relationship has also changed dramatically. Power has clearly shifted from the library to the user and the dependence relationship has been inverted. It is therefore important to think about how to ensure that users continue to use and value libraries. Chou (2011) discusses the changing relationship between libraries and their users in the changing ICT environment. It is not sufficient to provide useful, high quality and innovative library resources and services. The acid test of their success is whether they will be used frequently. Four factors are suggested – convenience, attention, awareness, and perception of value, that are likely to influence the future use of libraries.

M-learning is considered as the next generation of e-learning using mobile technologies. Students’ awareness of such technology is one of the most focuses for successful adoption. The study by Alzaza and Yaakub (2011) aims to investigate students’ awareness and requirements of mobile learning services among Malaysian students in the higher education environment. The study found that the higher education environment now has the necessary mobile technology infrastructure to utilize m-learning. Moreover, the results show that students have adequate knowledge and a good awareness to use such technology in their educational environment.

The digital revolution has dramatically changed the face of libraries in the 21st century. This posed a challenge to academic libraries to digitize their services and resources through appropriate ICT application in order to remain relevant. Abubakar (2011) study of academic libraries in Nigeria shows that, the libraries are faced with enormous problems, notably that of lack of proper funding. Despite that, against all odds tried to measure up with their contemporaries elsewhere.

At present application of information and communication technologies (ICT) has become gradually more important in textile college libraries. In the digital age endurance of libraries lacking ICT is at risk. Kumar (2012) observed the current position of textile libraries in the ICT environment in Haryana state. He explains the indication of available ICT infrastructure and e- resources to the libraries. The results reveal that, libraries are making an endeavor to do well in collection development, services, and infrastructure. The institutes have the well ICT infrastructure in their library and giving more importance to different aspects of ICT such as internet, email, online journals etc.

Taha (2012) aims to present a conceptual model for networked academic library services in a research-intensive university. The proposed conceptual model demonstrates the virtual

reference service, processing of research queries, online information search and retrieval, and data delivery to the researchers within a virtual research environment (VRE) in the UAEU. The study argues that the UAEU library should employ new strategies to meet the rising challenges of digital content and ongoing advances in information and communication technology (ICT), as well as consider how to embed it within a research-intensive university.

Hema, Nagarajan and Vanathi (2013) present the findings of a study which has designed to investigate the different aspects of ICT based resources use behavior of college students, Research scholar and Teachers. The study shows the purpose of use, awareness approach, experience of use and usefulness of ICT based resources.

Raval (2013) is reflected in his study about a paradigm shift that emerging from technological developments. He observed on the modern ICT tools and effective and efficient services of the academic libraries of the this Century. He says, the open information culture has shifted focus from subject experts and limited modes to the common man's participative domain. New modes of wikis, blogs, Web 2.0, information commons, instant messaging are in vogue, where academic libraries has the great onus of quenching the quests of information seekers by incorporating the revolutionary technological changes to provide state of the art services. The challenges associated with acquiring, organizing, making available, and preserving the information. In his concluding remarks stress on growth of the Internet. He is very expressive on internet which has made significant revolution in all the areas of science and technology. Libraries and librarians have to be change otherwise it is difficult to provide good service to students and researcher.

4.3 Information Seeking Behaviour

Undoubtedly, the availability of electronic access to information has gradually brought some major changes to human information behavior related sources and services and their use in all walks of life. Such changes are significant that library and information professionals are studying now information seeking behaviour, and its place within the learning process.

In the paper 'Information-Seeking Behaviour: Pattern and Concepts' Krikelas (1983) examines the elements of user studies and presents them as unified concepts within a model of information-seeking behaviour. The concept of information-seeking behaviour, information needs, information gathering, information giving and source preference are discussed. The user Information seeking behaviour and the user Characteristics in seeking information are two entities. These two entities are studied and have given emphasis on correlation of these two entities in information seeking by Sridhar (1987) in his study. The various aspects of information-seeking behaviour examined by Sridhar (1989) include the motives and purposes of seeking information, nature and type of information sought, delegation of information gathering work, and the time spent on in gathering activity.

Marchionini (1995) in his book explains the information seeking behaviour and changing environment. Bates (1996) made a survey on decades of research on information needs and information-seeking behaviour. The survey study reveals that in 1950s and 1960s the emphasis was on the needs of scientists and engineers. In 1970s the needs were in the social sciences.

The internet is considered as a potentially excellent tool for teaching and learning. Williams (1999) made a pilot study and presented in his article about the children information seeking behaviour on the internet. He says that the students whenever they use internet for their own

purpose in library, they browse internet to access textual and graphic information for their project work.

Marcella and Baxter (1999a) report the results of survey of information needs and information seeking behaviour of a national sample of the UK population. The Web is a new communication media for information publishing and information retrieval. It has changed the networked access to information by providing resources and directory services. Titia and Werf-Davelaar (1999) present view about improved information management and retrieval on the networked environment. Nicholas and Williams (1999) report the findings of research conducted in UK to establish the impact of the Internet on information seeking behaviour in the media, specifically among journalists.

The information seeking is not restricted with the libraries only but is also seen in the local council offices, professional people, post office, advice agencies, family and friends depending on the information they need to seek. Marcella and Baxter (1999b) report the results of their survey of information needs and information seeking behaviour of a national sample of the UK population. The major findings include that the majority of respondents had sought information in the past and that an even greater number predicted a future need for information. This shows the trend towards the new technology to access the information.

The World Wide Web is a tool for partial information gathering and learning for students. Fidel et al. (1999) analyze web searching behaviour of students. They point out that, web can be envisioned through user training on web resources and systems design which accommodates users' information seeking and searching behaviour. Searching the World Wide Web was the principal Internet activity and use was generally conservative in character. Nicholas et al. (2000) studied on the impact of the Internet on information seeking in the British Media and the focus was largely on the newspapers. They surveyed the Journalists and Media Librarians. The web publishing has made tremendous change in the information access process. There are two main platforms used for searching the Web – directories and search engines. Green (2000) explored the interrelation between Web publishing and information retrieval technologies. Most of the libraries have their sites to explain about library resources, products and services.

The level of end user satisfaction with information technology (IT) has widely been accepted as an indicator of IT success. Mahmood and Burn (2000) focused on the relationships between end user satisfaction and some of the variables such as perceived usefulness, ease of use, user expectations, user attitude towards information systems (IS) in widely divergent settings and the user skills. All library service providers will need strategies to cope up with this diversity. Eason et al. (2000) discuss the patterns of use of electronic journals.

The study of communication patterns and information seeking behaviour of users working in ICMR institutes is made by Basimalla (2000). Seeking Information from the Internet often starts from a search engine, using either its organized directory structure or its text query facility. Thelwall et al. (2001) give a new approach for specific information where a website that enables a user to search the individual websites.

Joinson and Banyard (2002) made two studies on information seeking behaviour on the Internet. Both investigated information seeking on the World Wide Web. It is tentatively argued that there is a tendency for people to access information on internet. Psychological processes of Web browsing behaviours are also discussed.

The 'user-study' on engineering undergraduate students is made by Majid and Tan (2002). This study investigates the information needs and information seeking behaviour of computer engineering students of Nanyang Technological University, Singapore. This study reveals that the types of information sources used by the students are more in the electronic format. The importance of and reasons for using certain electronic information sources are investigated by the authors.

The students are now very comfortable in using web resources and they want more resources through web enabled technology. Bilal (2002) reports the key findings of the information seeking behaviour and success of students in using the web. The students' behaviour and success were compared in his study. The study reveals that the use of search engine and the level of research skills are directly proportional to their success.

In general, the Information and Communication Technology has made its presence in every walk of life. Marcella et al. (2002) investigated the impact of information and communication technologies (ICTs) on the communication of legislative information to the general public or citizen.

Arabito (2003) has made a case study on user information seeking on library web how the users seek and gather information for their papers and dissertations and how the library web site is becoming more and more stuffed with resources and with instructions on how to use such resources. Minkel (2004) and Zhang et al. (2004) have studied the information seeking behaviour of users in the web portal environment.

Purnima and Vikas (2005) have made a study on information needs of the college faculties of higher education in Manipur. The study reveals that except for few colleges/universities, most of the faculties were not aware of the IT, due to lack of infrastructure in their libraries. They have studied about information needs of the faculties of colleges and universities. They studied on the use of computers, internet, e-journals, and digital resources.

The information seeking behaviour of human being changes from one environment to the other. The academic environment differs from that of the software company. There is work-task frame work for the software engineers. What is the information behaviour of these software engineers is a unique study made by Freund and Toms (2005).

The fundamental provision of high quality library services depends on understanding of human information seeking nature. Stenmark (2005) has made a study on the information seeking on intranet. He has studied the time taken in seeking information, query construction and result page viewing for their further use.

Nicholas et. al. (2006) have employed deep log analysis (DLA) techniques to demonstrate what usage data can disclose about information seeking behaviour of virtual scholars - academics and researchers. They have studied the information seeking behaviour of the faculty from those digital scholarly journals. This study is mainly to find information seeking behaviour of users in digital environment. Information Architecture for the World Wide Web is very important for the information seekers. Maurer (2006) highlights designing of web sites for users. He observes how the users approach information, consider what it means, and design to allow them to achieve what they need.

Safahieh and Singh (2006) investigate the information needs of international students at the University of Malaya. They have studied the barriers in the information seeking and also the

role of library in this process. They have also studied how the computer and internet literates meeting their information needs.

Today's knowledge workers rely increasingly on information to get their job done, and the availability of search engines to locate relevant information is thus essential. Stenmark and Jadaan (2006) discuss their study on intranet users' information seeking behaviour by analyzing search log files. They have found the shifting trends in the intranet search behaviour. Thompson (2007) has made a study on the information seeking behaviour of distance education students. The author infer in his article that the distinction in information needs and use by the students over the years is not be due to a generation divide, as previously reported in the studies, but it is due to technological immersion.

Over the last several years, the number of information resources has increased considerably. The emergence of new information environments, sources, and channels, especially the World Wide Web, regardless of the advantages, has brought new challenges and problems. On the one hand, the retrieval of information in response to users' real needs has become ever more complex and on the other hand, assessing the validity and reliability of retrieved information is a considerable problem. Yousefi and Yousefi (2007) have studied the information seeking behaviour and needs to examine the professional factors in information behaviours. They have also examined the role of new information environments in the information seeking process. In their paper they also suggested to fix the gap in information need and information seeking behaviour.

Turner (2007) studied on information seeking, retrieval, reading and storing behaviour of library users. He advises the digital library designers to be aware of the behaviour of the users of such system in the best interest of the digital libraries. He gives the guidelines to better understanding of users for designers of digital libraries. Farhadpoor (2007) explains this process and the way of information gathering.

Internet is the information tool for all the age groups for information seeking in the ICT environment. Salman and Hasim (2008) report the descriptive findings of the study on internet usage by Malays living in Kota Bharu, Kelantana, a semi-urban town in the North East of peninsular Malaysia. Their findings highlight that the nature of use of internet differs from younger to the older. Various factors may determine the information seeking behaviour of an individual or a group of individuals. Fatima and Ahmad (2008) have investigated the information seeking behaviour of the college students. They study the purpose, for which information is required, the environment in which the user operates users' skill in identifying the needed information, channels and sources preferred for getting information, and barriers to information. The same type of study in India has been done by Mahajan (2009) and Ahmad (2009).

Ansari and Kumar (2010) have observed the information seeking behaviour of college faculty in Uttar Pradesh. They study on the type of information sources used, preference of information formats, importance and reasons for using certain information sources. Gowda and Shivalingaiah (2010) have made a similar study on the researchers in the University Libraries in Karnataka. The results show that there is a significant difference among the research scholars of various disciplines in the preferences of various channels of information, modes of literature search, purpose of visit to the library and time spent. Kacherki and Thombare (2010) discuss on a case study of Management College to find out information seeking patterns of the library users. The study also covers print and e-journals and their advantages & disadvantages. The format preference, information seeking patterns, frequency

of use of print and e-journals discussed in detail. A similar study was done by Halder et al. (2010).

Ossai (2011) in her study on the utilization of information by the University of Benin law students found that most of the law students indicated that they heavily used library resources in the course of their academic programs. However her study also revealed that most of the law students had difficulty in locating and identifying suitable library information sources for case law, legislation and legal journal articles. Despite universal agreement about the importance of the “essential” lawyering function, little empirical work on the information seeking behavior of law students appears in either the legal education literature or the library and information science (LIS) literature. Anderson (2011) defines “information seeking” in the context of law students. He then reviews and synthesizes the few studies that have been performed. Finally, discuss the implications of the research for the law school curriculum.

Library online tools and websites are one of the most and important services made today. Nicol and O'English (2012) in their study found students and faculty satisfaction with library services and information made available to them. Information seeking and satisfaction with the library services are studied by authors. They found that, faculty, like students, also report increased satisfaction with current library-provided online tools and resources, the marked difference between the expectations of faculty and student users is an important one. Rising faculty expectations highlight the importance of strengthening communication and connection with faculty users so that libraries can retain relevancy in the academic environment.

Natarajan (2012) describes about electronic resources (e-resources) and their different types. The information seeking behavior of students, researchers and faculty in the e-environment is discussed. The role of library professionals in making the e-resources available to different types of user community is discussed in detail. It has been concluded that e-resources helps for anytime availability and easy to access, which helps for the researchers to carry out the research on time.

Ramesh and Sahoo (2012) attempt to assess and evaluate the information needs and seeking behavior of information resources of the library by the faculty members of the ICFAI Business School, Hyderabad. Data were collected from 70 Faculty Members for the analysis. Findings indicate that the library professionals are required to help them for maximum utilization of library resources and create awareness amongst the faculty members to access the library resources available to them.

Libraries in health sciences or dental sciences are not just collecting or licensing the information resources. They have various tasks to match the needs like curriculum based learning, research and point of care. Umesha and Chandrashekara (2013) tries to understand the information seeking and searching behaviour of dental science professional in Karnataka. This paper tries to find out the suitable information sources available for dental professionals, the areas in which dental professionals are seeking information, and the barriers they are facing in accessing information.

The study is carried out by Kumar (2013) on information seeking behaviour of faculty members of the BPS Women University. The results of his study done through questionnaire responses. The major and significant outcome of the study is that, the faculty uses Google for searching information. The majority of faculty says unavailability of information on the

internet. His study reveals that the majority of faculty members sought information for preparing lectures, keeping knowledge up to date and research work. Faculty members used several methods to seek information, but they prefer to consult a knowledgeable person in the field.

The study by Rupp-Serrano and Robbins (2013) explores the information-seeking behavior of academic education faculty from twenty large public research universities. The investigation includes an examination of how frequently education faculty seeks or access information, how they stay up-to-date on current developments in the field. The study highlights about electronic sources. The faculty emphasizes the importance of electronic access to scholarly journals and library databases and the continuing value of books, both print and electronic, for meeting the information and research needs.

4.4 Models of Information Seeking Behavior

The Information behaviour is sub-discipline within the field of library and information science. It describes how people need, seek, manage, give and use information in different contexts. It may also be described as *information-seeking behaviour* or *human information behaviour*.

Information carriers may include a variety based on the ISB and information-needs studies of various groups. The Information carriers may include a variety of channels, a variety of sources within the channels, and a variety of messages contained within these sources Johnson et al. (2006).

Wilson (1981) has noted that the information seeking results from the recognition of some need perceived by the user. The behavior may take several forms such as demanding information from the library or from other people who know. The approach has however been criticized because of insufficient theories, concepts and research methods, and because it has not taken into consideration the needs of the information seekers Dervin and Nilan (1986); Wilson (1994).

Ellis et al. (1993) model on information seeking behaviour includes six generic features. Ellis and Haugan (1997) have attempted to propose and describe the characteristics of a general model of information seeking behaviors based on the studies of the information seeking patterns of social scientists, research physicists and chemists, engineers and research scientists in an industrial firm. Ellis's elaboration model describes the features of information seeking activities as generic. These features are: Starting, Chaining, Browsing, Differentiating, Monitoring, Extracting, Verifying, Ending. Meho and Tibbo (2003) revise Ellis's study and give new model with more features.

Among the researchers, Kuhlthau (1993) has conducted empirical research about students' information seeking behavior and developed a general model of the information search process (ISP). The ISP consists of 6 stages as: initiation stage, selection stage, exploration stage, formulation stage, collection stage and presentation stage.

Wilson (1999) believes the strength of Ellis' and Kuhlthau's models as they are based on empirical research and have been tested in subsequent studies. It is important to examine the information seeking models as what students actually do when searching for information may be very different from what the librarians think the students do. Hayden (1999) has studied

the different information seeking models like Wilson's model of 1981, Krikelas model of 1983, Kuhlthau model of 1992, Big Six Skills model of 1992 proposed by Eisenberg and Berkowitz. The author says that we need to question who the library community is; we also need to question how we can provide information skills that leads the students towards information literacy.

Borgman (2000) defines information seeking as a continuous process, involving active and passive behaviors, and formal and informal communication. She points out the cycle of creating, using and seeking information which can be viewed as series of stages which people move back and forth, and they may be actively, creating, using and seeking information concurrently. Therefore, information seeking behavior refers to the pattern of response to the information need by person or group of persons. Jarvelin and Wilson (2003) discuss the functions of conceptual models in scientific research, in IS&R research in particular. What kind of models are there and in what ways may they help the investigators? What kinds of models are needed for various purposes?

Loeber and Cristea (2003) have made an attempt at investigating, analyzing and modelling the visitor and website. Weiler (2004) observes that the first model for study of information-seeking behavior in the general population was developed by James Krikelas in 1983. This model suggests the steps of information seeking as follows: (1) perceiving a need, (2) the search itself, (3) finding the information, and (4) using the information, which results in either satisfaction or dissatisfaction. Based on Krikelas' model, people begin to seek for information when they perceive that the current state of knowledge is less than that needed to deal with some issue (or problem).

Butterworth (2006) argues that typically Information seeking and retrieval behaviour is a strongly social, but weakly collaborative leisure activity. He discusses how these assumptions fit with the existing information seeking and retrieval (IS&R) models and proposes path for future work. The author touches on the browsing behaviour and searching behaviour and has made a sketch of the characteristics of 'personal history' researchers.

Shah (2008) proposes a model that helps us to understand the requirements for a successful collaboration. The author attempts to formalize the notion of collaboration and proposes a model of Collaborative Information Seeking (CIS) that put collaboration in perspective. His model consists of four layers such as information, tools, user and results.

5. How this literature review helps to researchers

Literature reviews are important because they seek to summaries the literature that is available on any one topic. They make sense of a body of research and present an analysis of the available literature so that the reader does not have to access each individual research report included in the review. This is important because there is an increasing amount of literature available for any researcher on Library resources, services, Information Seeking Behaviour, The impact of ICT environment. But library professionals, who cannot be expected to read and assimilate all the information on any one topic. Everyone who works has a professional duty to be up-to-date with recent developments and ideas that useful. It is also time consuming for anyone to assimilate process and decide how to implement all this information.

6. REFERENCES

1. Abubakar, B. M. (2011). Academic Libraries in Nigeria in the 21st Century. *Library Philosophy and Practice*, (1), 135.
2. Adams, W.J., & Jansen, B.J. (1997). Information technology and the classroom of the future. Society for Information Technology in Education. Conference paper. Orlando, Florida
3. Ahmad, S. (2009). Information seeking behaviour of archaeology and heritage management professionals of Delhi: a study. *PEARL: A Journal of Library & Information Science*, 3 (4), 1-6.
4. Akeroyd, J. (2001). The future of academic libraries. *ASLIB Proceedings*, 53(3), 79-84.
5. Alzaza, N. S., & Yaakub, A. R. (2011). Students' Awareness and Requirements of Mobile Learning Services in the Higher Education Environment. *American Journal of Economics and Business Administration*, 3(1), 95-100.
6. Anderson Jennifer (2011) Empirical Studies of Law Student Information Seeking Behavior and a Call for the Return of the Law Library as a "Laboratory" for Legal Education. Working Paper. None. (Unpublished).
7. Ansari, M.M.A., & Kumar, D. (2010). Information needs and information seeking behaviour of engineering and technology faculty members: a study. *International Journal of Library Science*. Retrieved December 20, 2007, from <http://www.ceserp.com/cp-jour/index.php?journal=ijls&page=article&op=view&path%5B%5D=671>
8. Anunobi, C.V., & Okoye, A.F. (2008). The role of academic libraries in universal access to print and electronic resources in the developing countries. *Library Philosophy & Practice, Annual Vol.* (May), 1-5.
9. Arabito, S. (2003). *Academic-watching: Library web usability and information seeking: A case study at the University of Trieste*. Retrieved December 20, 2007, from http://eprints.rclis.org/7131/1/academic_watching.pdf
10. Arte, A. (2001). The management of the scientific information environment: The role of the research library web site. *Online Information Review*, 25 (2), 88-93.
11. Ashcroft, L., & McIvor, S. (2001). Electronic journals: Managing and educating for a changing culture in academic libraries. *Online Information Review*, 25 (6), 378-387.
12. Asproth, V. (2012). Information technology challenges for long-term preservation of electronic information. *International Journal of Public Information Systems*, 1(1).
13. Atton, C. (1996). Towards a critical practice for the academic library. *New Library World*, 97 (1129), 4-11.
14. Balas, J.L. (2000). Doing it right: web design for library types. *Computers in Libraries*, 20 (1), 56-59.
15. Basimalla, S.R. (2000). *Communication patterns and information seeking behaviour of health science researchers/scientists: A study of ICMR institutes*. Retrieved March 18, 2008, from <http://eprints.rclis.org/archive/00002606/>
16. Bates, M.J. (1996). Learning about the information seeking of interdisciplinary scholars and students. *Library Trends*, 45 (2), 155-164.
17. Bilal, D. (2002). Perspectives on children's navigation of the World Wide Web: Does the type of search task make a difference? *Online Information Review*, 26 (2), 108-117.
18. Boakye, G. (1994). The academic libraries of developing countries. *New Library World*, 95 (1116), 12-17.

19. Boissonnas, C.M. (1997). Managing technical services. *Library Resources and Technical Services*, 41 (2), 147-154.
20. Bordeianu, S., Carter, C.E, & Dennis, N.K. (2000). Delivering electronic resources with web OPACs and other web-based tools: Needs of reference librarians. *Reference Services Review*, 28 (2), 111-118.
21. Borgman, C. L. (2000). From Gutenberg to the global information infrastructure: access to information in the network world. Cambridge, MA: MIT Press.
22. Brophy, P. (2000). Towards a generic model of information and library services in the information age. *Journal of Documentation*, 56 (2), 161-184.
23. Bullis, D. R., & Smith, L. (2011). Looking Back, Moving Forward in the Digital Age. *Library Resources & Technical Services*, 55(4), 205-220.
24. Butterworth, R. (2006). *Information seeking and retrieval as a leisure activity. DL-CUBA 2006 - Workshop on digital libraries in the context of users' broaden activities. June 15, Chapel Hill. USA. Part of JCDL 2006.* Retrieved June 28, 2009, from <http://www.ucl.ac.uk/events/dl-cuba2006/papers/Butterworth.pdf>
25. Carlock, D.M., & Perry, A.M. (2008). Exploring faculty experiences with e-books: A focus group. *Library Hi Tech*, 26 (2), 244-254.
26. Carlson, C.N. (2003). Information Overload, Retrieval Strategies and Internet User Empowerment. In Haddon, L. et al. (Eds.), *The Good, the Bad and the Irrelevant - the user and the future of information and communication technologies. Proceedings of the Conference on User and the Future Information*, 2003 (pp.169-173). Helsinki (Finland): [?].
27. Chakravarty, R., & Singh, S. (2005). E-resources for Indian universities: New initiatives. *SRELS Journal of Information Management*, 42 (1), 57-73.
28. Cholin, V.S., & Karisiddappa, C.R. (2004). Impact of electronic resources in the academic environment: Consortia approach. In N. J. Deshpande & S.K. Patil (Eds.), *University and college librarianship in India in the 21st century* (pp.134-148). Pune: University of Pune.
29. Chopra, Y.L., & Mukherjee, (2000). Application of IT in university library services of Jabalpur. *Annals of Library Science and Documentation*, 47 (2), 49-51.
30. Choy, F. C. (2011). From library stacks to library-in-a-pocket: will users be around?. *Library Management*, 32(1/2), 62-72.
31. Clegg, C., & Carey, N. (1997). Users' reactions and their implications. *Journal of Information Technology*, 12 (1), 15-32.
32. Clyde, L.A. (2000). School library automation: Is it an option? *School Libraries in Canada*, 20 (1), 2-4.
33. Corbin, J. (2011). Competencies for Electronic Information Services. *Public Access-Computer Systems Review*, 4(6).
34. Covey, D.T. (2002). Academic library assessment: New duties and dilemmas. *New Library World*, 103 (1175/1176), 156-164.
35. Dalbello, M. (2004). Institutional shaping of cultural memory: Digital library as environment for textual transmission. *Library Quarterly*, 74 (3), 265-298.
36. Davis, S. (1999). The changing role of serial acquisitions: Librarians in electronic environment. *Serials Review*, 25 (3), 102-103.
37. Dervin, B., & Nilan, M. (1986). Information needs and uses. *Annual Review of Information Science and Technology*, 21, 3-33.
38. Dollah, W.A.K.W. (2006). Digital reference services in selected public academic libraries in Malaysia: A case study. In C. Khoo, et al. (Eds.), *Proceedings of the Asia-Pacific Conference on Library & Information Education & Practice 2006 (A-LIEP*

- 2006). *Singapore, 3-6 April 2006* (pp.122-135). Singapore: Nanyang Technological University.
39. Dutch, M., & Muddiman, D. (2000). Information and communication technologies, the public library and social exclusion. In Muddin & Dave (Eds.), *Open to all?: the public library and social exclusion*. (Vol. 3, pp.106-127). London: The council for museums, achieves and libraries.
 40. Eason, K., Richardson, S., & Yu, L. (2000). Patterns of use of electronic journals. *Journal of Documentation*, 56 (5), 477-504.
 41. Elliott, V. (1998). Staff Development for Improved Collection Management in a Rapidly Changing and Enhanced Technological Environment. *Acquisition Librarian*, (20), 195-202.
 42. Ellis, D., & Haugan, M. (1997). Modelling the Information Seeking Patterns of Engineers and Research Scientists in Industrial Environment. *Journal of Documentation*, 53 (4), 384-403.
 43. Ellis, D., Cox, D., & Hall, K. (1993). A Comparison of the Information Seeking Patterns of Researchers in the Physical and Social Sciences. *Journal of Documentation*, 49 (4), 356-369.
 44. Farhadpoor, M.R. (2007). *Environment, human, problems, needs & information! How does arrange this puzzle? What is the information gathering (IG)?* Retrieved August 14, 2008, from http://eprints.rclis.org/11121/1/farhadpoor_paper.pdf
 45. Fatima, N., & Ahmad, N. (2008). Information seeking behaviour of the students at Ajmal Khan Tibbiya College, Aligarh Muslim University: a survey. *Annals of Library & Information Studies*, 55 (June), 141-144.
 46. Ferreira, P. (2007). New infrastructures and frameworks for knowledge creation and diffusion. Retrieved August 18, 2008, from <http://eprints.rclis.org/12246/1/ferreira.pdf>
 47. Fidel, R., Davies, R.K., Douglass, M.H., Holder, J.K., Hopkins, C.J., Kushner, E.J., et al. (1999). A visit to the information mall: Web searching behavior of high school students. *Journal of the American Society for Information Science and Technology*, 50 (1), 24-37.
 48. Fors, M., & Moreno, A. (2002). The benefits and obstacles of implementing ICTs strategies for development from a bottom-up approach. *ASLIB Proceedings*, 54 (3), 198-206.
 49. Freund, L., & Toms, E.G. (2005). Modeling the information behaviour of software engineers using a work-task framework. In A. Grove (Ed.), *Sparkling synergies: Bringing research and practice together. Proceedings of the 68th Annual Meeting of the American Society for Information Science and Technology (ASIST), October 28-November 2, 2005* (pp.11-22). Charlotte: ASIST.
 50. Gakibayo, A., Ikoja-Odongo, J. R., & Okello-Obura, C. (2013). Electronic information resources utilization by students in mbarara university library. *Library Philosophy and Practice (e-journal)*. Paper 869. Retrieved May 25, 2013, from <http://digitalcommons.unl.edu/libphilprac/869>
 51. Garcha, R., & Buttlar, L. (1999). Changing role of cataloguers in British academic libraries. *Library Review*, 48 (1&2), 66-72.
 52. Garrod, P. (1999). Survival strategies in the learning age-hybrid staff and hybrid libraries. *ASLIB Proceedings*, 51 (6), 187-194.
 53. Gaur, R. (2003). Model framework for reengineering of management libraries. *University News*, 41 (4), Jan 2003. 1-6.
 54. Ghaphery, J., Kesselman, M., & Watstein, S.B. (2001). Personalized information clients: short answers to simple questions about "my library" services. *Reference*

- Services Review*, 29 (4), 276-281.
55. Ghiselli, C., & Padula, M. (2001). A unified access to extract knowledge from heterogeneous web archives. *Online Information Review*, 25 (5), 299-310.
 56. Gowda, V., & Shivalingaiah, D. (2010). Information seeking pattern of researchers in the university libraries in Karnataka state. *SRELS Journal of Information Management*, 47 (1), 83-101.
 57. Green, D. (2000). The Evolution of Web Searching. *Online Information Review*, 24 (2), 124-137.
 58. Halder, S., Chakraborty, P.K., & Roy, A. (2010). Developing information seeking behaviour among the university students in an era of information explosion: need of the hour. *University News*, 48 (8), 22-28.
 59. Hammond, C. & Mitchell, E. (1997). Library instruction for the professionals: Information needs and libraries. *Reference Services Review*, 25 (2), 79-87.
 60. Harris, M. W. (2013). What's a digital library?. Retrieved May 24, 2013, from http://next-nexus.info/writing/infostudies/digital_libraries.php
 61. Hayden, K. A. (1999). *Information Seeking Models*. Retrieved May 9, 2007, from <http://www.ucalgary.ca/~ahayden/seeking.html>
 62. Hema, R., Nagarajan, M., & Vanathi, B. (2013). A Study on use of ICT based Resources and Services by the Faculty Members, Research scholars, and PG Students of Arts and Science colleges in Union Territory of Puducherry. *Journal of Advances in Library and Information Science*, 2(1), 1-6.
 63. Hyams, E. (1996). The information professional in the year 2000. *New Library World*, 97 (1129), 31-35.
 64. James, S. (1996). Learning and changing. *New Library World*, 97 (1127), 32-37.
 65. Jange, S., Sami, L.K., Angadi, M., & Aeri, J.R. (2006). Internet as an information source vs. level of satisfaction: Users learning style, perceptions, emotions and regression model at national institutes of technology in India. In C. Khoo, et al. (Eds.), *Library & Information Education and Practice. Proceedings of the Asia-Pacific Conference on Library & Information Education & Practice, April 3-6* (pp. 394-400). Singapore: Nanyang Technological University.
 66. Järvelin, K. and Wilson, T.D. (2003). On conceptual models for information seeking and retrieval research *Information Research*, 9(1) paper 163 [Available at <http://InformationR.net/ir/9-1/paper163.html>]
 67. Jeevans, V.K.J. (2000). Experiences of IT enabled public relations in an academic library. *Herald of Library Science*, 39 (3-4), 169-177.
 68. Jha, K.N. & Mishra, V. (1999). Internet: Emerging technology for information generation and its services to users. *Annals of Library Science and Documentation*, 46 (2), 59-64.
 69. Joinson, A., & Banyard, P. (2002). Psychological aspects of information seeking on the internet. *ASLIB Proceedings*, 54 (2), 95-102.
 70. Kacherki, U., & Thombare, M.J. (2010). Print v/s e-journal and information seeking pattern of users: a case study of SPJIMR. *DESIDOC Journal of Library & Information Technology*, 30 (1), 22-25
 71. Kanamadi, S.T. (2005). The changing information environment; the impact of information technology innovations on resources and services of libraries: A Study with special reference to institutes of management studies in Mumbai. [Ph.D. Thesis submitted to the Karnatak University, Dharwad, Karnataka State].
 72. Klein, M.S., & Ross, F. (1997). End-user searching: Impetus for an expanding information management and technology role for the hospital librarian. *Bulletin of the*

- Medical Library Association*, 85 (3), 260-268.
73. Knight, L.A. (2002). The role of assessment in library user education. *Reference Services Review*, 30 (1), 15-24.
 74. Koganuramath, M.M., & Angadi, M. (2002). Library home page design & development: TISS library case study. In T.S. Kumbhar (Ed.), *CALIBER 2002. Proceedings of the 9th national convention, CALIBER-2002, February, 14-16* (pp. 120-128). Jaipur: CALIBER.
 75. Kohl, D.F. (1997). Resource sharing in a changing Ohio environment. *Library Trends*, 45 (3), 435-447.
 76. Koufogiannakis, D. (2007). *Establishing a model for evidence based collection management*. Retrieved Sept 25, 2008, from <http://www.eblip4.unc.edu/papers/Koufogiannakis.pdf>
 77. Krikelas, J. (1983). Information-seeking behaviour: Patterns and concepts. *Drexel Library Quarterly*, 19 (2), 5-20.
 78. Kuhlthau, C. C. (1993). *Seeking meaning: a process approach to library and information services*. Norwood, NJ: Ablex Publishing.
 79. Kumar, J., Sumi, S., & Singh, G. (2010). *Redesigning academic libraries: moving towards user-oriented services and resources*. Retrieved January 25, 2008, from <http://www.ceserp.com/cp-jour/index.php?journal=ijs&page=article&op=view&path%5b%5d=721>
 80. Kumar, P. (2012, January). Information and Communication Technology in Textile Engineering College Libraries of Haryana, India. In *Information and Knowledge Management*, 1(3), 7-16.
 81. Kumar, P. (2013). Information Seeking Behaviour of Faculty Members at BPS Mahila Vishwavidyalaya, Khanpur Kalan (Sonipat) India. *Pearl: A Journal of Library and Information Science*, 7(1), 1-4.
 82. Kumar, V., & Singh, J. (2009). Use of CD-ROMS and internet resources by the students in Jaypee University of information technology, Himachal Pradesh. *PEARL-A Journal of Library & Information Science*, 3(4), 46-52.
 83. Kunneke, K., & Terblanche, F. (2000). The impact of changing external environment on the university library: A paradigm shift. *Mousaion*, 19 (2), 85-105.
 84. Lally, E. (2001). A researcher's perspective on electronic scholarly communication. *Online Information Review*, 25 (2), 80-87.
 85. Lennon, D. (1999). The future of 'free' information in the age of the internet. *ASLIB Proceedings*, 51 (9), 285-289.
 86. Logue, S., & Preece, B. (1999). Instructional support in the changing library environment. *Technical Services Quarterly*, 17 (1), 13-22.
 87. Lynch, C.A (1997). The changing role in a networked information environment: Authentication and authorization - part 1. *Library Hi Tech*, 15 (1-2), 30-38.
 88. Mahajan, P. (2009). Information seeking behavior: a study of Punjab University, India. *Library Philosophy & Practice*. Retrieved June 15, 2009, from <http://unllib.unl.edu/LPP/mahajan4.htm>
 89. Mahmood, M.A., & Burn, J.M. (2000). Variables affecting information technology end-user satisfaction: A meta-analysis of the empirical literature. *International Journal of Human-Computer Studies*, 52 (4), 751-771.
 90. Majid, S., & Tan, A.T. (2002). Usage of information resources by computer engineering students: A case study of Nanyang technological university, Singapore. *Online Information Review*, 26 (5), 318-325.

91. Mandal, B. R., Podder, A. K., & Choudhuri, B. C. (2012). Building Knowledge Management System: The Key to Special Libraries Renaissance at the Digital Era. *Challenges in Library Management System*, 24, 369.
92. Marcella, R., & Baxter, G. (1999a). A national survey of the citizenship information needs of the general public. *ASLIB Proceedings*, 51 (4), 115-121.
93. Marcella, R., & Baxter, G. (1999b). The information needs and the information seeking behaviour of a national sample of the population in the United Kingdom, with special reference to needs related to citizenship. *Journal of Documentation*, 55 (2), 159-183.
94. Marcella, R., Baxter, G., & Moore, N. (2002). Theoretical and methodological approaches to the study of information need in the context of the impact of new information and Communications Technologies on the Communication of Parliamentary Information. *Journal of Documentation*, 58 (2), 185-210.
95. Marchionini, G. (1995). *Information seeking in electronic environment*. Cambridge: Cambridge University Press.
96. Martin, H. (1999). The changing information environment in the media: Case study. *ASLIB Proceedings*, 51 (3), 91-96.
97. Maurer, D. (2006). Four Modes of Seeking Information and How to Design for Them. [In a personal blog]. Retrieved October 3, 2008, from http://www.boxesandarrows.com/view/four_modes_of_seeking_information_and_how_to_design_for_them
98. Meho, L.I., & Tibbo, H.R. (2003). Modeling the information-seeking behavior of social scientists: Ellis's study revisited. *Journal of the American Society for Information Science and Technology*, 54 (6), 570-587.
99. Minkel, W. (2004). They can't always find what they want. *School Library Journal*, 50 (8), 29.
100. Mittal, A. (1997). Changing role of librarians and information professionals in electronic information environment. *Lucknow Librarian*, 29 (1-4), 21-24.
101. Morrison, J.L., & Stein, L.L. (1999). Assuring integrity information utility in cyber-learning formats. *Reference Services Review*, 27 (4), 317-326.
102. Natarajan, D. M. (2012). EXPLORING THE E-RESOURCES FOR EDUCATIONAL USE. *International Journal of Information Dissemination and Technology*, 1(4), 193-196.
103. Nicholas, D., & Huntington, P. et al. (2006). The information seeking behaviour of the users of digital scholarly journals. *Information Processing & Management*, 42, 1345-1365.
104. Nicholas, D., & Williams, P. (1999). The changing information environment: The impact of the internet on information seeking behaviour in the media. In T.D. Wilson & D.K. Allen (Ed.), *Information Needs, Seeking and Use in Different Contexts. Proceedings of the Second International Conference on Research in Information Needs, Seeking and Use in Different Contexts, 1998* (451-462). Los Angeles: Taylor Graham Publishing.
105. Nicholas, D., Williams, P., et al. (2000). The impact of the internet on information seeking in the media. *ASLIB Proceedings*, 52 (3), 98-114.
106. Nicol, E. C., & O'English, M. (2012). Rising Tides: Faculty Expectations of Library Websites. *portal: Libraries and the Academy*, 12(4), 371-386.
107. Ossai, N. (2011). How law students utilize information resources: A case study of the University of Benin, Benin City. *International Journal of Library and Information Science*, 3(1): 1-14

108. Pandey, S.K. (2010). Management of preserving resources in digital library in Indian scenario: challenges and perspectives. *University News*, 48 (7), 4-13.
109. Phelps, C.V. (1999). It belongs in the library. *Information Outlook*, 3 (2), 24-27.
110. Prabha, C., & Dannelly, G.N. (1997). Resource Sharing in a Changing Environment. *Library Trends*, 45 (3), 367-573.
111. Purnima, & Vikas, C. (2005). Information needs in higher education: a study of college faculties in Manipur. *ILA Bulletin*, 41 (2), 16-19.
112. Ramesh, D. B., & Sahoo, S. K. (2012). Information Seeking Behavior of Faculty Members of ICFAI Business School, Hyderabad. *International Journal of Information Dissemination and Technology*, 1(4), 223-227.
113. RAVAL, D. A. M. (2013). E-Environment and new Challenges for Academic Libraries & Librarians. *Education*, 2(1).
114. Revill, D. (2002). Digital developments in higher education: Theory and practice - a review. *New Library World*, 103 (1174), 98-102.
115. Rieh, S.Y. (1999). Changing reference service environment: Review of perspectives from managers, librarians, and users. *Journal of Academic Librarianship*, 25 (3), 178-186.
116. Rockman, I.F. (2001). Visionary pragmatism in an e-library environment. *Reference Services Review*, 29 (3), 169-170.
117. Rockman, I.F. (2002). Engaging users by transforming the way we think. *Reference Services Review*, 30 (1), 5-6.
118. Rockman, I.F. (2003). Thinking deeply about future. *Reference Services Review*, 31 (1), 7-8.
119. Rowbotham, J. (1999). Librarians - architects of the future? *ASLIB Proceedings*, 51 (2), 59-63.
120. Rupp-Serrano, K., & Robbins, S. (2013). Information-Seeking Habits of Education Faculty. *College & Research Libraries*, 74(2), 131-142.
121. Safahieh, H., & Singh, D. (2006). Information needs of international students at a Malaysian University. In C. Khoo, et al. (Eds.), *Proceedings of the Asia-Pacific Conference on Library & Information Education & Practice 2006 (A-LIEP 2006). Singapore, 3-6 April 2006* (pp.198-205). Singapore: Nanyang Technological University.
122. Salman, A., & Hasim, M.S. (2008). Information seeking in the ICT age: how different age group respond to the phenomenon. *The Journal of Development Communication*, 1 (19), 61-71.
123. Scammell, A. (2000). Vision if the information future. *ASLIB Proceedings*, 52 (7), 264-269.
124. Schwartz, C.A. (1997). Restructuring academic libraries: Adjusting to technological change. In Charles A. Schwartz (Ed.), *Restructuring academic libraries: Organizational development in the wake of technological change* (pp.1-30). Chicago: Association of College and Research Libraries.
125. Sharma C., Sharma, R., & Singh, L. (2009). Information communication and technology (ICT) in research libraries of Haryana (India). *PEARL- A Journal of Library & Information Science*, 3 (4), 24-31
126. Sharma, H.P. (2008). Moving beyond library automation: Role of e-resources in academic libraries. *University News*, 46 (34), 6-10.
127. Shemberg, M. (2000). Through the web: Door to academic libraries. *Reference Services Review*, 28 (2), 178-187.
128. Shimmon, R. (1995). The librarian at the end of the galaxy. *New Library World*, 96 (1120), 43-48.

129. Sridhar, M.S. (1987). A Study of Information Seeking Behaviour of Space Technologists with Emphasis on Correlating User-Characteristics with Such Behaviour. Retrieved October 20, 2010, from <http://eprints.rclis.org/archive/00009153/01/ISBOFISTTHESIS.pdf>
130. Sridhar, M.S. (1989). Information seeking behaviour of the Indian space technologists. *Library Science*, 26 (N2), 127-132.
131. Sridhar, M.S. (2000). Modernisation of library services using IT potential and trends. *Herald of Library Science*, 39 (1-2), 28-41.
132. Stenmark, D. & Jadaan, T. (2006). *Intranet Users' Information-Seeking Behaviour: A Longitudinal Study of Search Engine Logs*. Retrieved July 18, 2007, from <http://www.viktoria.se/~dixi/publ/asist06.pdf>
133. Stenmark, D. (2005). *Searching the intranet: Corporate users and their queries*. Retrieved July 18, 2007, from <http://www.viktoria.se/~dixi/publ/asist05.pdf>
134. Stern, B. & Connaway, L.S. (1999). Shaping the Future of Libraries. *New Library World*, 100 (1152), 297-301.
135. Stickley, L. (2000). Changing the Way People look at Information Technology. *OCLC Newsletter*, 243, 31-32.
136. Stover, M. (2000). Technological concerns for library managers. *Library Management*, 21 (9), 472-482.
137. Subba Rao, S. (1997). Information retrieval services: Role of optical technologies. *New Library World*, 98 (1132), 16-24.
138. Subbarao, S. (1998). CD publishing and its scenario in India. *New Library World*, 99 (1141), 118-124.
139. Sun, P., & Rader, H.B. (1999). Academic Library User Education in China, *Reference Services Review*, 27 (1), 69-72
140. Taha, A. (2012). Networked library services in a research-intensive university. *Electronic Library, The*, 30(6), 844-856.
141. Thelwall, M. et al. (2001). Custom interfaces for advanced queries in search engines. *ASLIB Proceedings*, 53 (10), 413-422.
142. Thompson, A.J. (2007). Information seeking behaviour of distance education students. A master's paper for the M.S. in L.S degree. Advisor: Lisa Norberg.
143. Titia, V., & Werf-Davelaar (1999). Identification and resolution systems for networked access to information. *Online & CD-ROM Review*, 23 (6), 325-331.
144. Turner, K. (2007). *Information seeking, retrieving, reading and storing behaviour of library-users*. Retrieved June 18, 2008, from http://std.kku.ac.th/4830802252/Programme/Greenstone/example-greenstone/Word_and_PDF/Documents/rtf02.rtf
145. Tyckoson, D. (2003). On the desirableness of personal relations between librarians and readers: The past and future of reference service. *Reference Services Review*, 31 (1), 12-16.
146. Umesha, U., & Chandrashekar, M. (2013). Information Seeking and Searching Behaviour of Dental Science Professionals in Karnataka. *DESIDOC Journal of Library & Information Technology*, 33(2).
147. Veeranjanyulu, K., & Singh, S. (2003). Library and information services in information technology environment in academic Libraries. *Indian Journal of Information Library and Society*, 16 (1-2), 82-89.
148. Weiler, A. (2005). Information-Seeking Behavior in Generation Y Students: Motivation, Critical Thinking, and Learning Theory. *Journal of Academic Librarianship*, 31 (1). 46-53.

149. Weller, A.C. (1998). Changing role of health sciences librarians in the electronic environment. *IFLA Journal*, 24 (1), 11-14.
150. Williams, J. & Hunt, C.C. (1998). Library-faculty collaboration: Surveying a commuter population. *New Library World*, 99 (1140), 72-79.
151. Williams, P. (1999). The net generation: The experiences, attitudes and behaviour of children using the internet for their own purposes. *ASLIB Proceedings*, 51 (9), 315-322.
152. Wilson, T.D. (1981). On user studies and information needs. *Journal of Documentation*, 37 (1), 3-15.
153. Wilson, T.D. (1994). Information needs and uses: fifty years of progress, in: B.C. Vickery, (Ed.), *Fifty years of information progress: a Journal of Documentation review*, 15- 51. London: ASLIB. Retrieved May 15, 2006, from <http://information.net/tdw/publ/paper/1994FiftyYears.html>.
154. Wilson, T.D. (1999). Models in information behaviour research. *Journal of Documentation*, 55 (3), 249-270.
155. Wood, P.A. & Walter, J.H. (2000). The future of academic libraries: Changing formats and changing delivery. *Bottom Line*, 13 (4), 173-181.
156. Xiao, N. (2008). *Web 2.0 as catalyst: Virtually reaching out users and connecting them to library resources and services*. Retrieved August 15, 2008, from <http://www.istl.org/08-fall/article2.html>
157. Yousefi, A., & Yousefi, S. (2007). Information need and information seeking behaviour of professionals at an Iranian company. *Library Student Journal*. Retrieved September 2, 2008, from <http://www.librarystudentjournal.org/index.php/ljsj/article/viewArticle/65/124>
158. Zhang, D. et al. (2004). *User information-seeking behaviour in a medical web portal environment: A preliminary study*. Retrieved August 15, 2008, from <http://emeraldinsight.com/10.1108/14684520510598020>