Chapter- 2

REVIEW OF LITERATURE

2.1 Introduction

A literature review is a "critical analysis of a segment of a published body of knowledge through summary, classification, and comparison of prior research studies, reviews of literature, and theoretical articles" (https://twp.duke.edu/uploads/assets/lit_review.pdf).

Review of the related literature, an essential aspect of a research study, refers to a general retrospective survey of previous writings pertaining to one's problem. Familiarity with the related literature develops an insight into the problem, helps the researcher to discover what is already known, what others have attempted to find out and what problems remain to be solved. It guards against the possible limitations and minimizes the chance of duplication or repetitions. Thus, it is essential for a researcher to know what sources are available, what sources to use, and where and how to find them thereby saving many hours of aimless activity. A thorough and prudent study of various edited books, journals, research papers and conference proceedings has resulted in the accumulation of certain amount of literature with reference to the topic under consideration as because from past one decade or so the Internet became an important source of knowledge and an effective medium for research. For researchers, it is providing a range of new opportunities for collecting information, networking, conducting research, collecting data and disseminating

research results. Thousands of books and other print publications have been made available online which would be extremely difficult to locate otherwise, including out of-print books, and classic literature and textbooks that would be much less accessible in their printed form(Rajasekar,2013).The investigator made an intensive search of all relevant studies on usage pattern of e-resources in the university libraries and selected those that were thought to be significantly related to the topic under investigation. For the sake of convenience the researcher has divided this Chapter into eight sections i.e. Research Productivity, Research Disciplines, Efficacy, Data analysis, Research Scholar, Faculty Members Consortia Services, Community. Each section is further subdivided into subsections:

This can be shown schematically below:

1) **Community**

   Linguistics, Humanity & Social Sciences Community

   - ✓ Research Scholar

   - ✓ Faculty Member

   Science, Technology and Management Community

   - ✓ Research Scholar

   - ✓ Faculty Member

2) **Consortia Services**

   UGC-INFONET Digital Library Consortium

   AICTE- INDEST Consortium

   DeLCON Digital Library Consortium

3) **Research Disciplines**

   Scientific

   Social Science

University Level

Survey Methods

4) Efficacy

Computer efficacy

Electronic Resource Access efficacy

5) Data analysis

Percentile

Chat

Chi-square

Correlation

Critical incident technique

6) Research Scholar

J. R. F.

S. R. F.

M. Phil

Ph. D.

7) Faculty Members

Professor

Associate Professor

Assistant Professor

9) E-Resource

E-Journals

E-Books

Databases

E-News

E-Images

E-Music and Sound Collections

E-Reference

Subject or Information Gateway

(NB: Some of these terms have been rephrased to reflect the preferred terms)

For searching the literature, the researcher has started the search by using the broad terms in printed or electronic media, as this led to the more appropriate term. For printed document, the researcher has started with various documents within or outside the library by searching in index and contents. But in case of e-resource and after finding out the key terms, the researcher has made an attempt to refine the search strategies. Some of the chosen terms were combined using Boolean or proximity operators in electronic documents.

The purposes of the present literature review are:

- ➢ To understand the problem in the related study;

- ➢ To identify gaps and interpret the ways to further study;

- ➢ To avoid duplication of well-established findings; and

- ➢ To understand the latest developments in the field of study.

Literature published during1973- 2015 have been consulted from various sources such as journals, conference/seminar proceedings, e-journals, other articles from various academic websites, chapters in the edited volumes, etc. Databases used to locate pertinent information are:

Library and Information studies related:

- ➢ LISA (Library and Information Science Abstracts);

- ➢ Indian Library Science Abstracts (ILSA);

- ➢ IASLIB;

> ➤ Annals of Library and Information Science.

The following journals were also either browsed or consulted in some aspects:

> ➤ Emerald journals;
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> ➤ UGC-INFONET;
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> ➤ Indian journals;
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> ➤ Directory of open access journals;
>
> ➤ J-GATE;
>
> ➤ Open Access of Thesis and Dissertation;
>
> ➤ OALib journals;
>
> ➤ Directory of Open Access Books;
>
> ➤ Education for Information;
>
> ➤ Information Sciences;
>
> ➤ Information Society;
>
> ➤ Information Technology and Libraries;
>
> ➤ Journal of Computer Information Systems;
>
> ➤ Web of Science, SCOPUS;
>
> ➤ SSRN, Research Gate;
>
> ➤ Journal of Information Science;
>
> ➤ Journal of Librarianship and Information Science;
>
> ➤ Library and Information Science Research;
>
> ➤ Reference Services Review.

2.2 Scope and Coverage of the Review

The present literature review has covered 187 (one hundred and eighty-seven)

publications which are directly or indirectly related to the topic under study. Due to

the growth of knowledge and information society in a dynamic way, the generation of new information is being generated day by day to a great extent as a result, it became impossible for any person to cover/ preview all those literatures in a limited period of time. Thus, due to the tremendous growth in the output of information, researchers are unable to survey all the literature that is relevant to their field of expertise but, as per the mindset of the key term, various kinds of literatures were reviewed as per the main common factors; review of these studies has been covered different aspects of the user's study which have been divided into the following groups.

2.2.1 Review of Literature Related to E-resource/ E-resource Usage

Various kinds of literature are found related to e-resources and its usage pattern. Arshad & Ameen (2000) examined the usage patterns of a university library website to find out user's behavior of monthly use, its top most used resources and services and search phrases used to reach the library website. The findings of this study revealed that the university library website was heavily used in campus by users. However, it was used by a significant number of clients residing off-campus. Free scholarly journals, downloaded web resources, e-journals, e-books and donated personal collections were among the top most used resources and services.

Bhattacharya & Siddiqui (2003) conducted a study to know the various aspects of e-publishing with special emphasis on e-journals, pricing models of E-journals and E-books have been discussed. The survey result discussed the problems of intellectual property rights, and mentioned the role of the library professionals in managing the e-resources. Chandra (2003) carried out a study on development and use of web based information resources with specific reference to e-books. The study

results show that the importance of web based Information resources with specific reference to e-books and the various types of web based information resources.

Manjunatha & Shivalingaiah (2003) also carried out a study on information access on both in print and electronic media within library system. In this article the authors discussed about information formats and types, information access process and problems of information access in developing countries. Further, Manjunatha (2003) carried out a study on electronic resource sharing for eHective functioning of libraries. This paper attempts to identity the needs and factors influencing the electronic resource sharing. It also presents the requirements and strategies for eHeative resource sharing in academic libraries.

Pal & Das (2003) carried out a study on consortia based e-resource subscription initiatives in India. This paper recognizes the growth of library consortia across the globe and a special emphasis have been made to Indian efforts which led to develop consortia like − INDEST, UGC InfoNet, FORSA, CSIR, HELINET, IIMs, ISI Libraries Consrtia VIC, ISRO, ICMR, etc..

Choukhande & Dongre (2004) have conducted a study which reveals that electronic sources play a vital and viable role to cater to the needs of research scholars in the process of advancement of society in present environment. The prime function of any library is to provide efficient services to its users. This paper describes an analytical study of electronic sources and services provided to users with special reference to research scholars of VNIT library, Nagpur. The objective of this article is to study the different factors such as information, sources, services, adequate collection, various channels of information and the constraints faced by the research scholars in using or searching information through electronic sources. Prakash (2005) conducted a study to discuss the necessity for increasing the information resources in

electronic form to meet the current demand of academic libraries and institutions at affordable cost and also discuss the need and importance of E-journal consortium and resource sharing among libraries and information centers.

Debowski (2006) examined the effective service to users of electronic information sources. This paper highlights the need to maintain a clear understanding of users and their difficulties in accessing electronic information services. Electronic information service needed to focus more effectively on training users in information search, increasing the types of electronic support to users, and raising the profile of the information services to maintain its market share. To achieve that, information services would need to become much more attuned to the information needs and usage patterns of the hidden user.

Mahapatra (2006) carried out the study on information needs of scientists and engineers in electronic environment. The study explored the habit of use of documents and the library by the scientists, engineers and technologists of Indian petroleum industry in the electronic era. It also attempted to correlate the need of information with the habits of using of library. The results show that information needs and habit of library use of scientists and technologists are related to their rank in the organization.

Kamila (2007) has conducted a survey on electronic resources highly used media of scholarly world which highlights about the different types of E-Resources and the role of various consortia to access the same in huge amount in lowest price; some discussion about open source and commercial e-resource; requirements for commercial e-resource management and concludes with the future of open source in the open source vs. commercial e-resource battle. Further, Rani and Geetha (2007) have conducted a study on e-resource in modern libraries that highlights the

technology helps the reader to get the information in various other formats than the traditional means.

Again, Vishala & Bhandi (2008) have conducted a study which reveals that there is increased acceptance of electronic journals by the university academicians and also by the Information Centres. All the librarians were of the opinion that electronic journals played a constructive role in enhancing services, user satisfaction, meeting users‟ demands, users‟ expectations and above all the image of the library. The research demonstrates that all the librarians are fully acquainted with the benefits of e-journals and agree that the electronic journals have, and will continue to have an impact on the library services, library staff and on the information services.

Bhat (2009) made a study on increasing the discovery and use of e-resources in university libraries; which highlights that there is a large quantity of subscribed e-resources in our libraries and they contain quality information, though expensive. In spite of advantages in terms of access and search capabilities, they are underused. Systematic plan has to be in place for their promotion of use. Chandrakumar (2009) conducted a study on the use and usefulness of e-journals among the research scholars at the University of Madras. This investigation applied a standard survey method to analyse the use and utilization of e-journals. This study restricted only to the research scholars of the University. The study examines the category of same population, their computer, Internet access and use, and e-journals uses and usefulness have been analysed and summarized the findings. Devi, Devi & Singh (2009) carried out a study to find out the e-resources usage pattern by faculty members at Manipur. The finding of the study shows that e-resources facility available in Manipur was not suitable to meet the requirements of the e-learning community of the Institutions of higher learning in the state.

Further, Gowda & Shivalingaiah (2009) conducted a study on attitude of research scholars towards usage of electronic information resources of university libraries in Karnataka. The study tried to identify the gaps in the need and availability of electronic resources like online journals and databases in the university libraries. The study further reveals that the electronic resources have created a positive hope among the research community in searching the information. Moreover, Singh, Devi & Raychaudhury (2009) carried out a study on use of internet based e-resources at Manipur University. Walmiki & Ramakrishnegowda (2009) also carried out a study to know the collection of e-resources in Karnataka state university libraries. The paper provides the barriers in collection of e-resources in the university libraries. The university libraries had insufficient number of Internet nodes, low bandwidth, poor collection of CDROM databases and online resources.

Mishra and Gohain (2010) carried out a study on use and usage statistics of electronic resources at central library, Tezpur University; which highlights the use, evaluation and management of e- resources in Central Library, Tezpur University where the user community take the opportunities to make the best use of e- resources provided by the said library.

Natarajan *et. al.* (2010) conducted a study on use and user perception of electronic resources in Annamalai University. The study reveals that despite the availability of wide range of e-resources the frequency of their use was low which was due to lack of time, lack of awareness, lack of subject coverage and slows downloading. Singson & Leeladharan (2010) also conducted a study on usage of scholarly resources among research scholars in Pondicherry University. The findings of the study show that the use of electronic journals by research scholar is not up to the mark and library services need further innovation.

Vaishnav (2010) has studied a paper on e- collection development policy; which traces origin, defines e- resources which deals with the issues of e- collection development policy and problems that can be encountered in e- collection building, access etc. The paper highlights that the librarians dealing with e- resources will be confronted by questions about equipment requirements, pricing policies, bibliographic control, archival access, staffing implications and user needs.

Bhatt & Kumar (2011) carried out a study to discuss about the concept of e-journals and its role in opening the path for the dynamic research in society. The result of the study shows that e-journals are accessible to all scholars regardless of geographical location through proper compatible software and browser services. Further, Hwang et. al. (2011) carried out a study to investigate and analyze the usage patterns of electronic book (e-book) users and their perceptions of e-books from various perspectives of academic libraries in South Korea. This study shows the subscription environment, utilization and recognition of e-books at the university libraries in Korea. Most e-book users at the university libraries in Korea were aware that e-books are available through the Web sites of university libraries, and this recognition rate had dramatically increased compared to the recognition rate during the introductory stages of e-books. Again, Sasireka, Gopalakrishnan, and Balamurugan (2011) the study to know the status of availability of electronic resources in engineering institutions in Tamil Nadu; which described the availability of electronic resources in academic libraries in Tamilnadu. It is based on the case study conducted in the Engineering Institutions of Tamilnadu. The study provides evidence of the current status of e-resources, selection and access to various e-resources.

Bhattacharjee, Bhattacharjee and Sarmah (2012) have conducted a study attempting to find out the use and familiarity of E-journals through N-LIST consortium to the users of college libraries of Cachar District, Assam. This study also tried to highlight the present position of the college libraries as well as the thinking and satisfaction of the different categories of users like students, teachers and staff. On the basis of the findings after the data analysis the study reveals that there is increased acceptance of electronic journals by the college community and users in the present environment in which the N-LIST has to play a significant role to assist academic community. Major problems encountered by the users toward access to e-consortium are lack of awareness. Chandel & Saikia (2012) carried out a study on challenges and opportunities of e-resources. The paper highlights the issues, emphasizing the need to develop or procure an ERMS which could integrate all those resources along with printed material to provide single window approach to all resources available locally as well as globally in a universal library.

Ciri, Chand & Sen (2012) carried out a study on Indian Science and Technology journals in international indexing and abstracting databases. It is found that about 1200 Indian S& T journals are being covered by at least one of the international I&A services and over 300 S&T journals are openly accessible. However, coverage of Indian S&T journals by major citation databases in Web of Science (WoS) & Scopus is relatively poor whereas Indian Citation Index (lCO) promised to cover more Indian journals. De *et. al.* (2012) conducted a study with the treasure of electronic resource and management system at Central Library, IIT, Kharagpur. The result of the study shows that electronic resources are the essential part of the collection of any libraries and hence the management of e-resources is the main challenge to the library professionals. Gaur & Tripathi (2012) carried out a study

to the digital preservation of electronic resources. The paper highlights various problems of digital content and elaborates how digital preservation is more demanding and challenging than preserving print copies of journals.

Karmakar, Choudhury, and Goswami (2012) have conducted a study on use of online resources among the students of science & technology libraries of Guwahati to evaluate the use of online resources among the science & technology students of selected libraries of Guwahati and examines the problems in accessing the online resources, students level of satisfaction, frequency of use and various aspects of online resources. Kumar, Borah & Nath (2012) carried out a study to highlight the availability and usage of digital resources in modern libraries particularly in Assam University Central Library. The result of the study shows that the Digital-Resources were helping the users in many ways and it has become easier due to the emergence of Internet. Mrityunjoy De *et al*. (2012) also carried out a study on treasure of electronic resource and its management system at central library, IIT, Kharagpur to explore the access facilities of e-resource, electronic resource management systems and the present practice followed by the central library, IIT, Kharagpur for its successful dissemination among the users to meet their requirements. From this study, it is found that electronic resource management is the practices and software systems used by libraries to keep track of important information about electronic information resources, especially internet-based resources such as electronic journals, databases, and electronic books. Naga & Sten (2012) carried out a study to know the awareness and accessing of electronic resources by the post graduate students of North Eastern Hill University, Shillong. The study shows that the significant information on the level of awareness and use of electronic resources and their evaluation of the e-

resources collection in NEHU Central Library. The electronic resources used by the respondents had shown the low level of awareness about the e-resources collections.

Kumar & Sanaman (2013) carried out a study to know the multimedia resources available in the libraries of Delhi, and investigate the diversity of nature, types, and formats of multimedia resources available in these libraries. Findings of the study reveal that CDs/ DVDs were the most preferred physical storage form and compact shelves were the most preferred external storage form for the multimedia resources in all the libraries. Prathap (2013) stated the e-resources usage and research productivity in laboratories of the CSIR. The study shows the accessing and using e-resources are identified using performance indicators derived from number of scientists in the laboratory.

Pandey *et. al.* (2015) carried out a study with standards and good practice of e-earning and other e-resources of the libraries of Uttarakhand State. The paper provides an overview of the status of the use of e-resources amongst library users of all universities and colleges of Uttarakhand state. The electronic resources had changed number of facets of library services but in Uttarakhand state, it seemed very poor and gloomy.

Singh & Arora (2015) carried out a study to know the library resources and services in the selected university libraries of Haryana. The study reveals that the role of selected university libraries in Haryana, India in higher education and research of Engineering, Science and Technology. Singh, Singh & Singh (2015) also carried out a study to highlight to understand the usage, cost involved and ROI of e-resources of Banaras Hindu University Library System. The result of the study shows that suggest that Science Direct e-journals had a significant degree of usage by the users of BHU Library System.

Sinha & Gautam (2015) conducted a study on electronic resource management in University and Institutional Libraries of India in changing environments. The paper described about the e-resources, its characteristics, advantages, formats, issues and challenges for managing e-resources in the university and institutional libraries along with pricing models for e-resources.

2.2.2 Review of Literature Related to Internet/ ICT/ On-line Resources

From the review of literature on the use of Internet, awareness of ICT and Internet, Usage of off-line and on-line e-resources (CD-ROM Databases and E-Journals) , it has been found that most of the study have been carried out in Northern India (Rajiv Kumar and Amritpal Kaur 2004; Singh, Bhupesh Kumar and Kulvir Kaur , 2006; Mahajan, 2005; Madhusudan , 2007 ; Sharma , Singh and Mishra, 2008; Rahman and Ali , 2010; and Southern India (Birader, Rajashekhar, and Sampat Kumar , 2004; Khumbar and Vasuntha Raju (2007) Rao, 2010 and Singson and Leeladharan 2010).

Most of the studies have been conducted on Internet Use pattern of the academic community and local population of Barak Valley (Sinha, 2004) ; Information Communication Technology (ICT) and Internet Awareness Amongst the College and University Teachers (Sinha 2008) ; participants of Workshop on Basic Science Research (Sinha 2009) , Sinha (2010) and Borthakur, Das and Gohain (2010), ICT and Internet Literacy for accessing to E-Resources available under UGCINFONET Digital Library Consortium in North Eastern Region of India (Sinha, 2011, Sinha 2012).

Navjeet Kaur (2007) carried out a study to find out the role of e-resources and collection development policy. The paper provides an overview of the role of

information and communication technology (ICT), e-resources and network in library which lead to aggregate collections accessed remotely.

Singh and Jindal (2009) made a study to promote the use of e-resources in teaching, learning and research of DULS; which deals with the impact of ICT on Libraries and Information Centers (LIC) and describes the increasing role of LIC in teaching, learning, and research.

Sinha (2004) has conducted a study on the scenario of Internet use pattern of Assam University Community and Local population of Barak valley. This paper describes about the usefulness and advantage of Internet in day-to-day life, impact of Internet on the library and information services etc. and explains the aims and objectives of the present survey on the usage of Internet in Barak Valley.

Bansode & Pujar (2008) conducted a study on usage of Internet by research scholars at Shivaji University, Kolhapur. The study highlights the purpose of use, methods of locating information and search techniques used in retrieving the information by the research scholars. The findings of the results show that the research scholars use the internet for their research and communication purposes. Chopra (2008) carried out a study to find out the utilization of e-resources by the users of Guru Nanak Dev University, Amritsar. Findings of the survey shows that low speed of Internet access, erratic power supply and lack of required full text journals were problem faced by them with regard to the use of internet based e-resource.

Walmiki & Ramakrishnegowda (2009) carried out a study to know the collection of e-resources in Karnataka state university libraries. The university libraries under the study had insufficient number of Internet nodes, low bandwidth, poor collection of CDROM databases and online resources. Rahman and Ali (2010) conducted a study on the access and utilisation of the Internet based library services

available to the faculty members of Z.H. College of Engineering and Technology, Aligarh Muslim University. A number of studies have been conducted on Information Resources on the Internet for Higher Education and Research (Parekh, Harsha. 1999); Use of E-Resources by IT Professionals (Gireesh and Rajashekara, 2009) ; Use of Information Resources by the Researchers in the University Libraries in Karnataka (Gowda & Shivalingaiah,2009); Use and Impact of Digital Resources (Mendhe ,Taksande, & Taksande 2009); Use and Usage Statistics of Electronic Resources at Central Library , Tezpur University (Mishra and Gohain, 2010).

Sinha (2009) has also carried out a survey on specialized group of samples who belongs to scientific disciplines (Participants of Workshop on Basic Science Research) in terms of ICT and Internet awareness and observed the similar trends of finding towards awareness of ICT and Internet and utilization of E-Resources available under UGC-INFONET Programme. Rao (2010) in his study of Internet Use in Academic Library discusses the advantages of the Internet and its impact upon academic libraries. The practical application of email, Internet and other electronic media has been also described in brief and need of more application of ICT / computers in libraries has been emphasized.

Bhatt & Joshi (2009) conducted a study to know the impact of UGC INFONET Digital Library Consortium of the Maharaja Sayajirao University of Baroda; which attempted to find out the impact of IT and ICT, e-resources are found supplements and compliments to Library resources. E-journals valued to the research activity have accelerated usage of the research material in academic libraries.

Sinha (2012) has conducted a study to know the status of ICT and Internet literacy for accessing the e-resources available under UGC-INFONET Digital Library Consortium. The finding of the study shows that the impact of ICT and Internet

literacy amongst the Assam University library users for accessing to e- resources available under UGC- INFONET Digital Library consortium. The faculty, research scholars and students were mainly drawn from different parts of North Eastern States and few from other parts of the country which represent truly cosmopolitan population. Chakravorty (2014) conducted a study to know the need for e-resources Consortia for college libraries in Cachar District. The study shows that most of the libraries, under survey, suffer from inadequacy of library holdings, budgetary crunch, non-availability of ICT Tools and poor infrastructure.

2.2.3 Review of Literature Related to E-resource Consortia

Various literatures were found related to the E-resource Consortia. In a comparative study on various consortia, Skelton (1973) has shown that respondents used the known information sources and followed similar method to retrieve information from consortia services (Vaman, Bhandi & Gowda, 2000; Xia, 2006; Khosrowjerdi & Alidousti, 2010).

Vaman, Bhandi & Gowda (2000) carried out a study on understanding the usage of consortia and the role of vendor at present scenario. The study results show that the consortia probably resemble vendors more than they resemble libraries. All the consortia have unique/ different structures, histories, and specific goals; which must be taken care before subscribe any one. Thus, this study gives a clear picture about the understanding the usage of consortia and vendor.

Sahoo, Kshyanaprava & Jeevan (2005) also conducted a study to discuss the search facilities and search results of few resources accessible through INDEST Consortium. The result of the study shows that there were different resources accessible under this various consortia, but the four major resources found in the case

consists of ACM Digital Library, IEEE/IEE Electronic Library, Science Direct of Elsevier, and Springer Link.

Yernagula & Kelkar (2006) conducted a study on benefits and models of e-journals consortia. This paper discussed the concept, need, factors, advantages, disadvantages of library consortia. Malviya & Kumar (2007) carried out a study which describes the concept of library consortia, networking and consortia management techniques and future of consortia efforts. The paper provides an overview of the technology of the web, the increasing importance of electronic resources, and the advances in the resource sharing systems have created new opportunities for consortia. Further, Moorthy, (2009) carried out a study to discuss the consortia initiatives taken at Defence Research and Development Organisation (DRDO), a premier research organisation of Ministry of Defence, engaged in the indigenous development of cutting-edge defence technologies. The finding of the study shows that a new programme, already started which leads a positive impact on the minds of the R&D community of DRDO. Many laboratories were requesting enhancing the coverage of journals by adding publishers like ASME, Emerald, Professional Engineering, Royal Society of Chemistry, Sage, Springer, Taylor-Francis, Wiley, World scientific, etc.

Siddamallaiah & Butdisuwan (2009) also carried out a study on consortium approaches on e-resources under HELLIS Network. The result of the study has shown that HELLIS was to build various activities to consolidate it by building historical data, enabling strategic decision making, benchmarking, and data submissions for peer comparison including consolidation of expertise, expenditures and library services. Again, Singh & Rao (2008) carried out a study on library consortia in India. The finding of the study shows that the consortia are a media of sharing information/

documents among libraries. The study also shows that the environment about users' preferences and difficulties need to be studied. Varaprasad & Madhusudhan (2010) conducted a study on CSIR e-journal Consortium. This paper discussed the need for consortia, types, advantages and disadvantages of a consortium, problems faced by the consortiums and possible solutions for some of these problems.

Moreover, Malhan & Rao (2012) conducted a study to refocus the attention on institutional and collective responsibility for an effective consortia model. This paper discusses the status of consortia in India and portrays the challenges of e-resources access and describes how the changing landscape of libraries, information products offered by publishers and emergence of e-learning environment is influencing consortia. The article concluded the need to focus on more effective consortia models for just in place delivery of content for greater user convenience. In order to enhance their usage, the consortia resources must be in alignment with institutional thrust areas of work and users' information requirements for work performance. Vasishta, Manider Kaur & Dhingra (2013) carried out a study on implication of library consortia in Indian libraries. The finding shows that Indian libraries have to think and proceed consortium movement for maximum utilization of electronic resources at a reduced cost, time and space.

Many academic libraries have embraced the concepts of Library 2.0 and consortia. Till date, there are numerous articles reporting the genesis, rationale and implementations of various consortia with application in the library 2.0 (Gross & Leslie, 2008; Harinarayana & Raju, 2009; Holmberg *et. al.*, 2009; Yang *et. al.*, 2009; Joint, 2010; Adekannbi, 2011; Balaji & Kumar, 2011; Garoufallou & Charitopoulo, 2011; Mahmood & Richardson, 2011; Nesta & Jia, 2011); Ram *et. al.*, 2011).

2.2.3 Review of Literature Related to UGC-INFONET Consortium

Kembhavi & Murthy (2003) published in newsletter that the initiative taken by UGC-INFONET to bring information nearer to each library users. It was discussed in the newsletter that the various forms of e-resources will be made available to the universities through the continuous process which would bring in literature covering an ever increasing number of fields from a wide range of publishers all over the world. Murthy *et. al.* (2005) conducted a study on UGC-INFONET e-journals consortium an Indian model bridging the gap between scholarly information and end user; which states that higher education has been given prominence and access to many scholarly journals is made available from the support of University Grants Commission. The ultimate goal of the program was worked on the virtual philosophy of libraries i.e. right information to the right user at the right time with the help of state-of-the-art technology.

Chand, Devi & Chauhan (2006) have carried out a study on usage of UGC-INFONET e-journal consortia in north-east universities. The result shows that in the era of digital libraries, web-based electronic databases have become important resources for education and research, providing functionality and ease of use superior to print products. Analysis of usage of such online systems can provide valuable information on user behavior and on usage of electronic information in general. Furthermore, the findings can be used to improve effectiveness of these electronic systems and identify areas for improvement, ranging from user interface and functionality to documentation and product training. Gupta (2006) conducted a study on use pattern of print and electronic journals at the Kurukshetra University, India. The purpose of this paper was to analyse the use of electronic journals from the INFONET consortium by faculty and research scholars of physics and chemistry at Kurukshetra University, India. The result of this study shows that use of print

periodicals and frequency of daily use of print periodicals is more among teachers than research scholars. In Chemistry research scholars have more awareness than faculty members, whereas the faculty members are more aware about INFONET than the research scholars (less than 50 per cent) in both the subjects.

Sinha, Murthy & Kumar (2006) have carried out this study with the aim to identify various issues relating to access and bibliographic control of e-journals, access management problems, policy issues, and development of e-journals consortium approach to subscribe scholarly peer reviewed journals for their library users in network environment. It also describes a brief account of UGC-INFONET E Journals Consortium, INDEST, FORSA, and other consortium for providing access to scholarly journals to the end users of universities and institutions of higher learning for their R& D activities.

Vishala & Bhandi (2006) carried out a study on availability of library and information science electronic journals through UGC- INFONET project. The paper provides an insight in to the UGC¬INFONET Project and shows the awareness to the library and information professionals, research scholars, and faculty and post graduate students of library and information science regarding the availability of the scholarly journals in the field of library and information science

Nikarn & Pramodini (2007) carried out a study on usage of e-journals and databases by the academic community of University of Mysore. This paper describes the use of e-journals and databases subscribed by UGC- INFONET consortium by the users of University of Mysore. The paper also examines the utilization and satisfaction levels of users with respect to the e-resources. Patil & Parameshwar (2007) have conducted a study explains about UGC-INFONET Consortium of the INFLIBNET and examined use of the Consortium by the Faculty Members and

Research Scholars. Further, the data is collected through a questionnaire to study the information needs of the faculty members and researchers in Chemistry and use of UGC-INFONET Consortium by the faculty members and research scholars in the Department of Chemistry, Gulbarga University, Gulbarga. The paper revealed that UGC INFONET Consortium is much helpful in fulfilling their information needs. Majority of the users rated the Consortium as excellent and good. But there is need to improve internet facility.

Bharati & Zaidi (2008) have conducted a study which describes the use of E-Journals and E-Databases (subscribed by UGC-InfoNet consortium) by the users of Aligarh Muslim University. Structured questionnaire and interview schedule are used as the ideal method of data collection for this study. The study result shows that UGC-INFONET consortium. Further, Chand.et al (2008) conducted a study to access the e-journals through UGC INFONET Digital Library Consortium among the universities of north-east India; which highlights the usage of the access for e-journals in ten universities of North East India. The paper briefly describes open access journals and the measurement tools of e-journals.

Majumder, *et. al.* (2008) also carried out a study to highlight the access of e-resources by the users of LNB Library with special reference to UGC- INFONET. The result of the study shows that the use of Internet resources expected to increase in future. The students and teacher who participated in this survey were aware of Internet resources and majority of them used these resources in support of their study and teaching and they were adept at using these sources. Again, Veenapani, Singh & Devi (2008) carried out a study to find out the use of e-resources and UGC-INFONET Consortium by the teachers and research scholars in Manipur University. The survey has indicated that, the electronic resources were highly useful for the

research and academic community; in which the UGC-INFONET had to play a significant role to assist the academic community in the provision of this unique service to academic and research community.

Upadhyay & Chakraborty (2008) have conducted a survey which describes the use of online journals and databases and their awareness among researchers of IT-BHU. In this case study, a survey was conducted using questionnaire, to collect the data. This paper examines the researcher‟s awareness and use of online journals and databases available through UGC- INFONET, INDEST and university library.

Veenapani, Singh & Devi (2008) this study highlight the usages of UGC-INFONET Consortium by the teachers and Research Scholars of Manipur University. The analyses of the result show that the findings of the study in the tabular form. It concludes with some suitable suggestion for further improvement of the system. Patel, Yatrik (2009) also conducted a study on cutting-edge technology in library and information services. The result of the study shows that the project leads to give raise the e-resource sharing pattern. The implementation of such technology for the off-line access of e-resources available under UGC-INFONET Digital Library Consortium explored for the e-resources could also be avail under the N-LIST Project to the Colleges of the Country.

Arora & Trivedi (2010) conducted a study to describe major activities, operations, and services of UGC-INFONET Digital Library Consortium. The findings of the study show that resources subscribed under this consortia and major items of negotiation. It elaborates on methods used for promotion of e-resources amongst member universities. Borthakur, Das & Gohain (2010) conducted a study to know UGC- INFONET and its availability and use in universities of Assam. The paper traced the availability of e-resources under the UGC-Infonet e-journal consortium in

university libraries of Assam. It also highlighted the current use of e-journals accessed by the users of three universities of Assam namely Dibrugarh University, Tezpur University and Assam University. Borthakur, Das & Gohain (2010) has made a study on UGC- INFONET and its availability and use in universities of Assam; which traces the availability of e- resources under the UGC-INFONET e-journal consortium in university libraries of Assam. It also highlights the current use of e-journals accessed by the users of three universities of Assam namely Dibrugarh University, Tezpur University and Assam University.

Mukherjee and Kumar (2010) carried out a study to identify the users' requirement of online journals in general and to know the use of online journals that are available through UGC- INFONET e-journals consortium by research scholars of the Banaras Hindu University, Varanasi. The study reveals that there is a demand for more e-journal titles although a substantial number of users (61.90 percent) are satisfied with the existing model of UGC- INFONET Consortium. Further, the result shows that comprehensive training on availability and usability would be of great help to the users.

Walmikir, Ramakrishnegowda & Prithviraj (2010) conducted a study on awareness and use of UGC-INFONET digital library consortium by the faculty members of Kamataka state universities. The result of the study shows that only 39.79 percent of the faculty members aware of the UGC- INFONET Digital Library Consortium resources whereas 35.99 percent are aware but do not use UGC-INFONET digital library consortium. Further, 24.22 percent faculty members are not aware of the availability of the consortium resources. Majority of the non-users belong to social sciences and humanities and those who have not undergone formal computer training. Comparatively the science faculty uses the consortium resources

more frequently than those belonging to social sciences and humanities. Lack of knowledge to use, insufficient internet nodes, slow bandwidth and lack of relevant information sources are found to be the major problems faced.

Bhatt (2011) carried out a study to find out the trends of university libraries in India. The paper highlights major roles of university libraries in the digital age. Further, the role of INFLIBNET, UGC-INFONET Digital Library Consortium and National Knowledge Commission had been also discussed in the context of changing academic library environment. Raghuram & Vatnal (2011) also carried out a study to know the effectiveness of UGC-INFONET Digital Library Consortium on users of social science faculty, Goa University. The study shows that the UGC-INFONET played very significant role to assist the academic community in the provision of this unique service to the academic and research community.

Sinha, Singha, and Sinha (2011) have conducted a study on usage of electronic resources available under UGC-INFONET Digital Library Consortium by Assam University Library users in which an attempt has been made to evaluate the usage pattern of electronic resources made available in the Assam University Library under the UGC- INFONET E-Journals / Digital Library Consortium of UGC/INFLIBNET amongst the research scholars and teachers of North Eastern Region of India with special reference to Assam University, Silchar.

Pradhan, Rtli & Arora (2012) carried out a study on implications of SUSHI for analysis of usage statistics of e-resources under UGC-INFONET Digital Library Consortium. The article gives a brief of the implication of SUSHI for creating a usage statistics portal at the INFLIBNET Centre for monitoring the usage of the member universities. Bhatt, Sunil (2013) also carried out a study to know the role of consortia system and document delivery/ e-information services under JCCC@UGC-INFONET

consortia of Banasthali University. The study shows that the usages of online resources were increase and the findings of the study show that the users of Banasthali University were using UGC-INFONET Consortia services in good manner as the total downloads increased as compared to earlier year and it was expected to be improved in forthcoming years. The researcher got perform for quality research output as most of the peer reviewed journals could be accessible through JCCC.

Kattimani & Dixit (2013) have carried out a case study on the usage of UGC-INFONET and e-Journals by research scholar and faculty member of Central University of Karnataka. In this study an attempt has been made to know the users requirement of online journals in general and to know the use of online journals that are available through UGC-INFONET e-journals consortium in particular. Londhe & Deshpande (2013) conducted a study to know the usage of e-resources available through UGC-INFONET Digital Library Consortium by library users of University of Pune. The study reveals that usage of e-resources was increasing with increasing awareness of e-resources and using e-databases. It was further found that the users from Chemistry field were more active in using e-databases than any other fields.

Joshi (2014) conducted a study to know the awareness and use of UGC-INFONET Digital Library Consortium e-resources in universities of Gujarat. The survey result shows that 57.20 percent of the users are aware and use the UGC-INFONET Digital Library Consortium e-resources, whereas 31.16 percent are aware, but do not use and 11.62 percent are not at all aware of the availability of the consortium resources. The majority of non-users belong to social sciences and humanities and those who have not undergone any type formal computer training.

2.2.4 Review of Literature Related to INDEST/ DeLCON Consortium

Arora & Agrawal (2003) took an initiative to give concept of consortia based subscription to electronic resources for technical education system in India under INDEST Consortium. It is found that the consortium was offered very attractive prices from the vendors not only because of combined strength of its members, but also due to the eagerness of publishers to enter the Indian market. The rates offered to the consortium are lower by 50% to 90% depending upon the category of institution.

Joshi (2005) carried out a study to highlight the usage pattern of consortia such as INDEST, INFONET and INFLIBNET. . The result of the study shows that the despite the success stories of many of the leading consortia that were operating in India, the Consortium movement was yet to catch up with the new generation librarians. Mudhol & Vasanth (2005) also carried out a study to highlights the importance of library consortia in this digital era stating its salient features and pricing models. This paper also discusses about the FORSA and INDEST Consortium. The paper describes that how library could act with speed commitment otherwise publishers will not be encouraged to give access to their databases of journals.

Nisha, Ali & Ara (2008) conducted a study to find out usage of INDEST and UGC-INFONET e-journal consortia. The survey has indicated that, majority of users were aware about INDEST and UGC-INFONET Consortia at IIT, Delhi and Delhi University. Most of the users accessed e-journals and databases through INDEST and UGC-Infonet consortia. Ratnakar, Prerna & Satyanaryana (2009) carried out a study on consortia to promote access to medical information at Indian Council of Medical Research. The paper provides an overview of the consortia initiated by the Indian Council of Medical Research to share the resources of its medical libraries among its 25 institutes.

Further, Sahoo & Agarwal (2012) carried out a study for engineering, science and technology community under INDEST-AICTE Consortium. It also discussed the selection of e-resources, review of e-resources, license agreement with publishers, fair use, usage analysis of various e-resources, economics of expenditure, research output of core members, archival access of e-resources for the core as well as other member of the consortium and future plan for the consortium. Srivastava, J P & Verma, Vijay Kumar (2014) conducted a study to know the issues and challenges of library consortia with Special Reference to INDEST-AICTE Consortium. The survey result discussed the types, needs, models and advantages of consortia subscriptions.

Again; Lal (2012) carried out a study on consortia based electronic information resource sharing in Department of Biotechnology Institutes in India. The paper describes the DBT's Electronic Resources Consortium (DeLCON). The result of the study shows that the consortia approach can be considered as a major step towards library collaboration in sharing electronic resources.

Choudhury & Unindajyoti (2015) also carried out a study to highlight the use of INDEST and other e-resources by engineering students and teachers of Assam. The result of the study shows that traditional libraries could not full fill the needs of users easily. The e-resources were the only way to enhance the engineering education. The online facility had enabled the teacher and the students to enhance their academic excellence by providing them latest information.

2.2.5 Review of Literature Related to Trends of Research Publications

Gopikuttan (2005) conduct a study on productivity of scholarly publications of faculty members of the University of Kerala from 1980 to 1999 (20 years). The study shows that the mean year taken to bring out one article by a lecturer is 0.915. reader is 0:996 and professor is 0.471. Further, female members need more time than male

members to publish journal articles. Kumbar, Gupta & Dhawan (2008) conducted a study on growth and impact of research output of University of Mysore, 1996-2006. The study indicates the patterns of communications of university scientists and studies the extent of concentration and scattering of their research output in different journals. It also describes the share and characteristics of select highly cited papers and the top productive authors.

Gupta (2010) also carried out a study on comparative study of India, China and South Korea in S&T publications output during 1999-2008. The present paper compares overall S&T publications output of India, China and South Korea across twenty broad subjects as defined by Scopus bibliographical database in terms of annual growth rate, national publications share, h-index, share of international collaborative papers and high-cited papers. The results indicates that China has a clear edge over South Korea and India in terms of global publication share and h-index, but lacks behind in terms of share of international collaborative papers and high-cited papers. Patra (2014) conducted a study on Google Scholar-based citation analysis of Indian library and information science journals. The result of the study shows that multiple-authored articles generally got more citations than the single-authored articles. This study also suggested to the researchers to increase collaborations for better visibility of their research.

2.2.6 Review of Literature Related to Library/ Internet Usage Pattern

Dalgleish and Hall (2000) conducted a study to identify the ways in which the World Wide Web can be used as part of the students learning process. The findings of the study has shown that the key factor which influenced the students to use the web as an information resource was "time" factor, in the sense of obtaining information

quickly and easily, not experiencing difficulties in locating the required information, and avoiding inherent delays in the computer systems. Further, Debowski (2000) examined the service provided to the users for increasing the usage of information technology in providing library services. This paper highlighted the need to maintain a clear understanding of users and their difficulties in accessing electronic information services. Electronic information service needed to focus more effectively on training users in information search, increasing the types of electronic support to users, and raising the profile of the information services to maintain its market share.

Eason, Richardson & Yu (2000) conducted a study on usage pattern of electronic journals. The results of the paper have shown that many printed journal were likely to be replicated when other electronic journal services are launched. Liew, Foo & Chennupati (2000) examined a study on graduate student end-users' use and perception of electronic journals. This paper discussed about the e-journals in the light of the use and perception of graduate student end-users, and their expectations of future e-journals. The results of the paper have shown that user study presenting significant implications for the design of future e-journals are reported. The results also have shown a significantly high acceptance of e-journals by this category of users.

Spink, Jansen & Ozmultu (2000) examined a study to see the use of query reformulation and relevance feedback by Excite users. The findings of the study have shown that the analysis of a large data set of user queries use relevance feedback. Further, it has also shown that the limited use of query reformulation and relevance feedback by Excite users; only one in five users reformulated queries and most relevance feedback sessions were successful. Zhang, Lee & You (2001) investigated the usage patterns of an electronic theses and dissertations system in the Korea

Institute of Science and Technology Information (KISTI) Electronic Theses and Dissertations in South Korea. The results of the study indicate that the KISTI ETD system usage had seen a significant increase since its second year. It was also found that there are a very large number of one-time visitors to the KISTI ETD system.

Franklin & Plum (2002) conducted a study on Internet based electronic services usage patterns at four academic health sciences at four geographically disparate academic health science libraries in the USA between 1999 and 2002. The principal fields of inquiry included demographic differences between in-house library users as compared to remote library users by status of user; users' purposes for accessing electronic services. The results of the study construct a guide which service decisions in academic health sciences libraries. Peters (2002) carried out a study on the value of e-resource usage statistics which contain a wealth of information. The article also concluded with some speculation about the overall value and long-term potential for e-resource usage statistics. Online information environments such as digital libraries became self-improving and modify their organization and presented in order to better way for data collection about human behaviour.

Sinha, (2004) carried out a survey to examine the scenario of automation and networking of library and information centres (LICs) of North Eastern region of India. In the study, he had found that automation and networking scenario of North Eastern region of India was not up to date mark and there was many initiatives should be taken to develop the situation. Sanchez-Franco and Roldan (2005) analyzed the web acceptance and usage between goal-directed users and experiential users, incorporating intrinsic motives to improve the particular and explanatory TAM (technology acceptance model) value, which is traditionally related to extrinsic motives. As per the reports of the study; experiential and goal-directed users did not

weigh extrinsic and intrinsic motives in the same way when on the web. Goal-directed users were more driven by instrumental factors and focused on their decision-making process while experiential users were more motivated by process.

Gauger and Kacena (2006) conducted a study to explore what effects institutional size and the selections of JSTOR collections have on the overall usage statistics. The article provides some insights into how JSTOR data can be used to demonstrate the match of resources to curriculum as well as areas where library outreach and instruction might encourage appropriate use. Zainab, Huzaimah and Ang (2007) examined the users preference and use of electronic journals in general, especially those published in a hosting system, Electronic Journal of the University of Malaya (EJUM), Malaya. The finding of this study have shown that the electronic journals are used for searching new information, reading full-text articles, reading abstracts, and browsing the table of contents. The majority of respondents also prefered articles in pdf form. Further, the majority of respondents read the abstracts first to determine relevance before downloading the articles.

Johnson (2008) examined cognitive differences between frequent and infrequent Internet users. The findings of the paper has shown that the significant group differences in visual reasoning consistently favored frequent Internet with respect to visiting chat rooms and downloading music. However, infrequent users demonstrated better verbal reasoning than frequent users. The findings of the paper also supported the conclusion that extensive and appropriate use of the Internet is associated with increased human capacity to reason. Pors (2008) conducted a study on the traditional use patterns of high school students. The findings of the study indicated that traditional demographic factors alone cannot explain all of the variability in the

students' information behaviour. It is also indicated that a correlation exists between the amount of use of libraries and digital resources.

Kim (2011) analyzed the relationship between text recommender system using user's usage patterns to develop a novel and flexible recommender system based on usage patterns. The results of the study revealed that a novel recommender system based on usage patterns and keyword preferences. Unlike conventional approaches of collaborative filtering and content-based filtering, the proposed approach analyzes the data captured from the navigational and behavioral patterns of users. The study also has shown that a set of keywords can be regarded as the representative of contents, and therefore metadata dose not needed to be generated by human indexers or image analysis techniques.

Singh and Joshi (2011) also conducted a study on the students of Kurukshetra University on their internet preferences. This study has indicated the variations in the preferences of male and female students. It also reflects how female students prefers search through search engine while male students used www and search engine. Suseela (2011) conducted a study on application of usage statistics for assessing the use of e-journals in University of Hyderabad, India. The paper highlighted the application of usage reports by the university library in decision making during renewals/subscriptions, i.e. the selection of databases, upgrading the versions, increasing licences, cancellation of subscriptions, etc. Bankole (2013) evaluated the use of internet services and resources by scientists at Olabisi Onabanjo University, Ago Iwoye, Nigeria. The finding has shown that use of internet use was widespread to all scientists as majority of them were using it every day. The majority of respondents accessed the Internet from a commercial cyber cafe´ followed by homes. Email was the most popular internet service, while Google, followed by Yahoo and Scholar

Google, were the most used search engines. The majority of the scientists preferred for getting information from the internet, while less than one-third still prefer the traditional library.

Bhattacharjee, (2014) conducted a study on e-resource and Internet use pattern of social science community of Tripura University, Tripura. In the study, it was found that social scientists generally facing problem while accessing e-resources. Hwang *et. al*. (2014) carried out a study to investigate and analyze the usage patterns of electronic book users and their perceptions of e-books from various perspectives of academic libraries in South Korea. This study has shown that most e-book users at the university libraries in Korea aware about e-books through the Web sites of university libraries.

Arshad and Ameen (2015) examined the usage patterns of a university library website to find out user's behaviour of monthly use. The findings of this study have revealed that the university library website was heavily used by users. Free scholarly journals, resources downloaded, e-journals, e-books and donated personal collections were among the top most used resources and services. Renaud *et. al.* (2015) conducted a study on mining library and university data to understand library use patterns. The results of the study have shown that it was difficult to determine the correlation between library use and student achievement. A major outcome of the effort was that the collection and secure analysis of research data completed in a much more efficient manner than if the partnership has been made.

2.3 Conclusion

The above review of literature based on the related studies of e-resource usage pattern and consortia based services in different parts of India and along with various

countries of the world. Further, reviews were conducted as per the mindset of the proposed theme. Various aspects along with the main theme have discussed; which helps to identify the gaps in the related study. But, from the review of literatures, it was also found that till usage pattern of consortia based services particularly in Universities of Assam, India remain untouched in many aspects of ICT environment especially usage pattern of scholarly electronic resources and bibliographic databases, quality of e-resources provided by the UGC INFONET Digital Library Consortium, DeLCON and AICTE -INDEST Library Consortium.