CHAPTER II

REVIEW OF RELATED LITERATURE

2.0 INTRODUCTION

This chapter provides various kinds of inter-related literature, which may guide a perception to the present study. Review of earlier works done in the subject helps in increasing Knowledge about the topic. In the following sections, a review of the earlier studies conducted in the area of Digital Libraries by various authors has been collected and provided in this chapter.

2.1 Digital Library Management

Grossman, R. et. al. (1995) focused their research on high performance digital libraries. They concluded by saying that interfacing object management, the function of physical placement of data, clustering on disk and media, and high-performance computing environments are cardinal for future research on digital libraries.

Richard, E. (1995) Opined that creation of digital library is a formidable task which necessitates building and maintaining electronic journal databases through electronic publishing is popular with scholars, may not be able to adopt it due to its disadvantages.

Bearman, D. & Trant, J (1998) studied Authenticity of Digital Resources. They stressed in their research that licensing and protection mechanisms creators of authentic digital representations must be able to track copies of their original contribution and must be provided compensation for investment in high-quality authoritative knowledge.

The objective of many technical methods to address the issues of authenticity and integrity of information resources is to determine the suitability of methods along with its purpose.
Macmillan, G. (1999) in his research studies on information ecologies that consist of a system of people, values, practice and technologies as the environment. He points that environment and as well as the people interaction was found largely missing in the digital libraries.

Lancaster, L. (2000) studied the functionality of digital library from librarian’s views and listed down the evaluation criteria for conventional and digital library information.

✓ There is no difference in the expectation of library and digital library.
✓ User success in terms of the effectiveness of the information retrieved

Sadagopan, S. (2000) discussed the difficulties of digital libraries. His research discussed the opportunities available for research scholars for creating and assessing content in Indian languages that were stressed with the plans for large-scale digitization.

Ravi, S. (2000) Studied the emerging trends and the future of digital libraries in terms of their utility and cost-effectiveness. They stressed that with the development of digital library and the role of the traditional librarian’s need to be re-assessed in this new atmosphere.

Soerfel, D. (2002) reiterated a framework for broad digital Library research and development to evaluate and integrate current research. He believed that this will advance digital libraries to their full potential.

Arora, J. (2003) did research on the development of an institutional repository for the Indian Institute of Science (IISc), Bangalore. His research discussed the choice of the INDEST consortium based on the consortium approach to digital libraries for developing the IISC institutional repository. Greenstone Digital Library (GSDL) software is primarily on licensed e-resources, employing about 40 software packages for creating OAI-complaint (Open Archives Initiative) databases.

issues and number of issues from the individual to the social, less awareness of digital library are also discussed.

Yi-Tzu, C. (2004) studied the role of digital libraries in societal transformation and its growth. His perspective is that collective impacts have been significant as well as substantial, as evidenced by the advances reported in publications and proliferation of conferences. This had led to modest business successes, but the real progress in that is yet to materialize. Futuristic digital library research must focus on a real connection to social benefits as envisioned.

Arora, J. (2004) carried out research at the central library, IIT Delhi on the network enabled digitized collection. He stressed the external pressure that arises for digitized collection and also infrastructure and highlighted the multi-pronged strategy adopted.

Dorner, D.G. (2004) discussed digital information resources. He stressed that four focus groups and a web-based survey to evaluate the impact of digital information resources on the roles of collection managers in research libraries in five major English-speaking countries. The study revealed the increase in levels of responsibility and time spent on activities related to digital resources have generally increased compared to 5 years ago and while those for non-digital resources either have increased marginally remained the same or plugged down the survey indicated prominent increases in consortia-related work.


Krishnamurthy, M. (2005) analyzed digital library services in the Indian Statistical Institute (ISI), Bangalore. He insisted that true digital libraries are not just digital collections, but will entail librarians to work collaboratively to create distributed, publicly accessible resources and to coordinate and guide implementation. It is necessary to establish a collaborative structure with the escalating price of electronic journals along with the traditionally published print subscriptions which have forced library community to explore alternative means of subscription. Utility
and cost effectiveness. They stressed that with the development of digital library and role of the traditional librarian’s need to be re-assessed in this new atmosphere

**Beke, B. & Shinde, S. (2005)** studied critical issues that are related to digital resources - Selection, Acquisition, Legal aspects and Preservation. He says that Digital resources are created or scanned image, converted material, video clipping, Digital audio. The following reasons are the growth of Digital Resources:

1. Changes in publishing trend and towards electronic publishing,
2. Information explosion through the digital technology,
3. Financial constraints on the part of libraries,
4. Improving infrastructure for accessing material,
5. Growing popularity of the Internet.

Three ways to preserve digital resources are 1. Technology preservation, 2. Technology Emulation and 3. Data migration.

**Satish, M.V. & Umesh, M. (2005)** studied on digital preservation or digital archiving in libraries. He says issues involved in the preservation of digital objects were clustered into three:

1. Legal issues which cover intellectual property rights, preservation strategies, security and licensing.
2. Technological issues that covered digital media changes in technology and authenticity
3. Organizational issues which cover cost, selection, role and responsibilities were discussed.

**Chattopadhyay, S. (2006)** made a study on digital preservation of Electronic Resources in the modern library. He stressed preservation of Digital objects, benefits of digital preservation and problems of digital preservation such as technical, social, legal, copyright issue, training for professionals are highlighted
Subrata, S. et.al. (2007) discussed the digital resources management in libraries. The concept of a digital library and challenges for professionals were stated. The informative communication technology skills that are necessary for digital librarians are the following: Management skills that include administrative skills, computer skills, human relationship skills, presentation skills, information skills, and measurement skills. The authors also exhorted the periodic upgradation of skills by library professionals.

Alwarammal, R. (2008) studied the usage of digital resources by the engineering faculty at Kalasalingam University. The survey revealed that majority of engineering faculty members use electronic journals, full-text articles as the first source of information for their teaching and research. The study also revealed the lack of awareness among faculty members about the e-mail alert service. It also discussed reading preferences of format files such as PDF and HTML.

Isfandyari Moghaddam, A. (2009) gave results on digital libraries are treated as determinant information centers. Libraries especially their managers are thinking about how phenomenon digital libraries can effectively be managed. DLs included catalogers, indexers and hyperlink texts.

Dhanavendan, S. et al. (2009) studied the utilization of digital resources by engineering faculty. The study concluded that faculty uses digital resources to extract general knowledge and students use it for communication purpose. The respondents expressed the adequacy of digital information awareness with 50% of satisfied digital resources.

Detlor, B. (2010) did study that Information Management, concerns with the how information was acquired, created, stored, organized, and distributed and also studied the efficient and effective information access, processing used by people and organizations.

Behera, J. & Singh, S. (2011) described in detail the challenges of collection development of Indian libraries in the digital era. The development of institutional repositories at the institutional level and national level were studied. The requirement for library and human resource development to manage these institutional repositories
was discussed. The concept of digital libraries and their functions were stated well. The problems of digital resources in the digital library mentioned are 1. No user-friendly environment 2. Lack of training the library staff 3. The problem of digital device 4. Lack of technologically upgradation 5. Financial constraint.

**Rosario Vasanth Kumar, P.J. (2012)** focused on research of information professional in the digital era. He analyzed the role of libraries and electronic resources in a digital library. The traditional libraries are becoming outdated with the emergence of new digital storage and dissemination of information. The automation system and services of libraries are utilized by electromagnetic and RFID technologies.

**Thanuskodi. S (2012)** studied the formation of library consortiums and its impact on Digital Library Consortium. It has been found that 94.40% of the science faculty members were aware of the UGC-INFONET Digital Library Consortium where as only 86.99% of social science faculty members were aware of the availability of UGC-INFONET Digital Library Consortium. The study also revealed that majority of the respondents 75.35% use the UGC-INFONET resources for research work.

**Senthil Kumar, K.R. (2012)** discussed on building in digital libraries. He insisted according to digital library goes far beyond an electronic version of the library. Digital library should be multifunctional, diversified, and readily accessible to the users. The future digital libraries should be able to help people transform information to knowledge by effective digital information acquisition, retrieval, organization, and dissemination and there are some of the current trends of digital libraries.

**Li, Jing et al. (2012)** in their study on Understanding Usage Transfer from Print Resources to Electronic Resources. They're explored that usages and effectiveness of print resources and electronic resources in the context of Chinese university libraries. This research survey was conducted and data were analyzed from 273 users. The study found that users migration to usage behaviour from print resources to electronic resources. This study highlighted current status of the use of
university library Electronic Resources which helped to librarians in Chinese university libraries

Liu, S. (2014) focused on the design of network system and security system in the digital library. He says how security system maintains in the digital library and which type of network adopted in the digital library. A digital information resource is a key to the development of the digital library. Digital library is the backbone of the information system.

Pratheepa, A.K. & Jayaraman, S. (2014) did research on challenging digital environment. They analyzed the role of information technology explosion which has changed in the present world. This had transformed the role of librarians into those of information managers. The research gave an outline of the problems of digital libraries, changing the role of information managers, overall competencies knowledge, attitudes necessary to create, organize, retrieve and disseminate digital information (text, images, and sounds) in the digital libraries.

Vijay Kumar, V. & Rama Mohan Rao, P. (2014) discussed the formation of digital libraries and new activities, the technology used in digitization. They stressed that digital Libraries are being formed in different fields e.g. education, health, science, culture development, governance and so on. Digital Library software packages are freely available at the recent time. The creation and sharing of information through the digital library collections. They integrate digitization into the plans and policies of any institution to maximize its effectiveness.

Megha Goyal, G. & Priti, S. (2014) focused on semi digital-digital library. She insisted on reducing time, cost and efforts of users while improving the performance of the library system specifically the digital services provided by a library. The study also exposed the lack of knowledge among the users, shortage of e-resources and Procurement of e-resources and user’s partial access to resources cause ineffectiveness in the system.
Kirti, M. (2014, January) focused on digital library projects. She stressed on vast growth of e-resources, e-journals, e-books, online databases in the libraries. The present situation was created due to huge advances in information communication technologies (ICTs). Now a day’s libraries spend on acquisition of these e-resources as these are extremely used by the students and researchers.

Neeraj Kumar, G. (2014) studied the digital library consortium and concluded that libraries had both printed documents as well as electronic information resources in their collection. The use of e-resources particularly has been increasing day by day. E-resources are the prime factor and they become a common part of most library resources today. The advent of ICT and its use in library operations has changed information needs and behaviour of the users.

Kannan, S. (2014) carried out a research on digital information sources and conclude by saying that Digital information Sources are becoming more and more popular since they provide full-text search, reference link and multimedia information easy in access and utilizing them. The Digital information resources were to be underutilized by most of the Library users. The purpose of this study finding ways and improve the accessibility and utilization of digital information sources.

Tochukwu, C. et al. (2015) focused their research on web-based digital library management system. He stressed the issues associated with the growth of digital library especially its difficult to store, manage a large amount of documents and its access by users. The Digital library management system (DLMS) was web based which helps to the quantity of digital information and made it available to the world in parallel.

2.2 Electronic Resource Management

Roxanne, M. (1998) argues in his paper on user needs for electronic information. He expounded on the preparedness of librarians for digital libraries of the present and future. Still, some of the libraries are not networked and able to access the internet. The collaboration with IT technocrats which entails work on skills development and assessment alone ensure the transition to effective information service in the near future.
Stackpole, L. & King, R. (1999) studied the role of e-journals supports for scientific research. E-journals are a web based information system and gateway permits access to researchers. It can also serve as the portal to a local digital repository with sophisticated online browse and search capabilities, linking users to journals on publishers websites.

Devi, T.S. & Devi, S.K. (2001) researched on the management of e-resources in the modern library and information science and its associated challenges. The role of Information Technology and the rate of changes on e-resources were analyzed which were able to change their outward form and living documents. There was the three type of documents that were used in digital resources. The elements are considered for the selection of digital resources are demands of the users, quality of the resources its cost, content and scope of electronics resources, technical support, type of access, installation of the supported software, licensing agreement.

Jaya Prakash, J. (2005) described the role of electronic journals consortium in contemporary society. The development of libraries in many angles was attributed to the wave of information evaluation technology which paved the way to access information at the global level with reasonable infrastructure. The benefits of consortium-based subscription were wider access to electronic journals at lower cost, access to international databases and full-text resources. The consortia in India such as CSIR, UGC-INFONET, INDEST, FORSA, & HELINET and their role in archival access of electronic journals was discussed.

Chinnasamy, K. et al. (2008) had studied that access on e-resources. This study was found that students were the use of e-resources effectively. Most of the students were the use of e-resources in regularly and the majority of the students were agreed that the library staff extends their help in utilizing the e-resources.

Briget Anitha, C.V. (2009) had studied about the use of e-journal among physicians. She study points out that 50% of physicians spent 1 to 2 hours on the internet and 39% used up less than 1 hour on the internet weekly. The analyzed from the study that greater part of the respondents agree that e-journals provide valuable services.
Parameshwar, S. & Patil, D.B. (2009) did in their study about the use of electronic resources in the Gulbarga University. The data was collected through a questionnaire faculty members and researchers in various PG departments in Gulbarga are much helpful in fulfilling their information needs. This study also mentioned the need to train the faculty members and the research scholars have to use the electronic resources.

Carlol Tenopir, C. et al. (2009) had studied about Electronic journals and changes in the scholarly articles and reading patterns. Their found that the average member of readings per year in science faculty member continues to increase. But average time spent per user reading was decreasing. Electronic journals continued to increase in every year.

Khan, A. & Ahmad, N. (2009) focused on Use of e-journals by research scholars. They have exposed that most of the research scholars were aware of the accessibility of e-journals and mostly used for reference purposes in their research work. They're fully agreed that the usage of e-journals, the quality of research work improved. However found that which was a lack of training for full utilization of e-journals.

Gronvall, K. (2009) emphasized the study on the acquisition of electronic Resources. He stressed that the budget for e-resources was utilized from 45% in the library budget for every year. The duplication avoids in print and electronic copy in the library. Open sources of e-resources mostly download and keeping on the library server.

Dhiman, A. (2010) delineated the changing role and professional responsibility of librarians and in the modern libraries. He stressed that multiple accesses which were the advantages over print versions of Electronic resources. This to important in professional training in the management of digital and electronic resources. As in Electronic environment, the accessibility to materials is simple where
the library and Library professional have to be empowered with information technology skills.

The issues related to license agreements, mode of payment, utilization of statistics, managerial skills and issues related to consortia, information technology skills, Preservation aspects like technological, and staff training etc., were analyzed. The importance activities of various consortia and their advantages. Open access resources are also discussed.

Das, S. (2010) carried out a detailed study on the availability of electronic resources in the degree college libraries of Purulia of West Bengal. They analyzed for acquisition and promoting electronic resources attributes like reliability, portability, availability, and security with respect to electronic resources management. Three-step strategy for acquisition of electronic resources suggested is a subscription to free electronic resources that are available free electronic books, journals and free databases. Association with an existing library consortium and the role and objectives of UGC-INFONET digital library, selection of electronic resources such as relevance quality, format, duplication, cost effectiveness and training for staff and users were discussed.

Greesh Kumar, P. (2010) focuses on archiving of electronic journals. Subscription of electronic journals by publishers, consortia, the individual and third party was analyzed and selected the electronic resources through PANDORA project by the National Library authorities was discussed.

Sangaranarayanan, D. & Nagarajan, M. (2010) discussed in their study on the use of e-resources by the faculty of agricultural science in Tamil Nadu. He also highlighted Agricultural University that 23.29% respondent’s make use of e-journals, 47.81% make use of Google search engine, 32.88% of the respondents make use of e-resources at department, 32.05% of the respondents reported that time saving is the main benefit of using e-resources and 26.16% of the respondent’s make use of e-resources for their research purpose.
Dhanavandan, S. & M Tamizhchelvan, M. (2012) studied that Evaluation of E-resources in Academic Libraries in Tamil Nadu. He exposed that e-resources are resources in which information is stored electronically and it can be accessible through electronic systems and network environment. E-resources have accessed that variety of different file formats. Immediate access is possible in the E-resources within a fraction of a second. This research paper identifies the availability of E-resources facility and accessing mode in the engineering institutions in Tamilnadu.

Das, P & Mohapatra, R. K. (2012) described the Collection Management of E-Resources and Services. They're also discussed that Electronic Resources have made vast changes in the libraries. The four basic criteria for selection of Electronic Resources which were quality, subject relevance, technical aspects and cost. They're also stressed that development of new technology for the storage of Electronic Resources to the challenge of the future libraries. This study explains the e-collection development and management in the engineering college libraries in and around Bhubaneswar city.

Mittal, P. & Bala, M. (2013) defined that e-resources selection principles in digital libraries. He says Electronic resources are available on the internet which were like a storehouse of data and information on different subjects and topics. According to them, these resources were the best alternate to fulfill the student and research scholars. The choice of the e-resources that could be the best according to our requirement. The selection of e-resources could be tough but very helpful for the student and research scholars.

Bala, M & Mittal, P. (2013, March) focuses on various types of e-resources used by Research scholars. This research paper highlights the different types of e-Resources available with their brief description which are many types of e-Resources are available on the internet to very helpful for Research scholars. The main objective of this paper is to aware the students, specially the research scholars about the available e-Resources. So that they may be able to use these e-Resources for data collection in their research work.

Chauhan, K. (2013) exposed that Open Access E-Journals in Information Science. He highlighted E-Journals are important changes everywhere and had been
playing a significant role in Digital Libary. The Lots of Open Access E-Journals journals are hosted on their own websites. Which is essential to analyses the efficacy of these E-Journals. The present study has been undertaken to know the Actual state about the open Access E-Journals in Information Science. This study analysis the facilities and features of online Open access Journals in information Science.

Cox, J. (2014) argues in his paper on e-books that there is a definite synergy with e-learning. E-books are a supplement and successfully co-exist with printed books. E-books looks are bright, easy to reading on the screen, more flexible for the user, easily download and taking printout.

2.3 Digital Library Software

Neelam Sharma, N. (2012) exposed that present automation and digitization projects in university libraries and the challenges to effective information delivery. He discussed to the conversion of in-house library materials into an electronic format that had lead toward the creation of a digital library. The paper puts more effort on library automation, formulation and implementation of digitization policies, institutionalizing digital library services, staff training program and the introduction of user education/digital literacy programs.

Ruchi Srivastava, R. (2014) exposed that Digital library with open source software, He stressed that Open source software (OSS) is software with source code is available with a license for use or modification as users or other developers. This software usually develops as a public collaboration and freely available.

Das, A.K. (2015, July) focused that Open sources digital Library Software. He highlighted that easily modify the Open sources code and accessibility to user-friendly. Open sources digital library software does not require the major expenditure and make possible to libraries, which have a larger control over their working environment. This paper presents that evaluation, usability features and utility of open source digital library software like Greenstone, DSpace and EPrint.
2.4 Digital Library File Format

Shaikh, M. et al. (2015) did research on digital library and file system. He exposed that most digital libraries implemented in organizations cloud server architecture. These libraries require a large infrastructure investment in cloud server setups and maintenance. His research was on the implementation of digital library system using cloud Distributed File System. This is an upcoming technology being used widely for its flexibility, scalability, and fault tolerance.

Shrinivasrao, D. et. al. (2015) discussed on digital library framework. This paper briefly explicates about libraries, digitization and computerization process, a different type of file format, awareness among the teachers and students, E-resources and various digital facilities in the libraries.

2.5 Digital Library service


Bathrinarayanan, A.L (2006) Boon for Human Services” discusses the general background and digital library and open source software (OSS). The paper also pointed out the criteria can be adopted for digitization of documents. Software this paper highlights what is and OSS, its features software licensing advantages and advantages, features and functions and Greenstone.

Kumar, et. al (2008) on their paper “Building Digital Library Using LS Digital” described digital library technologies are rapidly developing to cater to the information needs of the society. LS digital is commercial software for building digital library and an add-on item to Libsys software and thus is fully compatible with Libsys. The entire process is fully automated thereby requiring minimum effort by the user and integration with Libsys database implicit. It provides great benefits to the user who would be able to search both digitized and non-digitized library
collection through a common library OPAC. LS digital supports the functions like-resources, structure, definition, scanning versions, maintenance, PDF conversion, research database maintenance, searching and retrievals.

**Khan, A. & Ahmad, N. (2009)** revealed that most of the research scholars are aware of the availability of e-journals and largely use them for reference purposes in their research work. They fully agree that with the usage of e-journal, the quality of research work improves with the enrichment of appurtenant contents and materials leading to high quality manuscript. It is however found that there is lack of training in proper and full utilization of e-journals.

**Isfandyari Moghaddam, R. (2009)** reports that digital libraries (DLs) are treated as determinant information centers. Libraries especially their managers are thinking about how phenomenon "DLs" can effectively be managed. So, the present article aims to provide managers of DLs with an approach. To do this, 39 two main pillars considered in the definition offered by Digital Library Federation namely staff and users are debated. Accordingly, some skills, instructional programs and qualities needed both for users and staff of DLs with which they can interact more effectively with new technologies such as DLs are included in the text. In fact, this paper emphasizes on educational function of DLs and thus offers an approach for its implementation from a managerial standpoint. It should be noted that specialized staff is not simply limited to the librarians including catalogers, indexers and archivists but because of nature of DLs, other fields particularly computer science is also involve

**Sankaranarayanan, D. and Nagarajan, M. (2010)** discussed in their study on use of e-resources by the faculty of agricultural science, Tamil Nadu Agricultural University that 23.29% respondents use e-journals 47.81% use Google search engine, 32.88% of the respondents use e-resources at department, 32.05% of the respondents reported that time saving is the main benefit of using e-resources and 26.16% of the respondents use e-resources for their research purpose.
Magesh, R. et. al (2010) conducted a study on ICT based resources using behaviour of the respondents NAAC accredited Arts and Science Colleges in Thiruvalluvar University. From the study, it is observed that among 765 respondents, 22.88% of the respondents were made aware through teachers and research guide, 28.76% respondents were accessed internet in off campus and on – shore, 21.05% of the respondents have used internet frequently. The study regarding the problem of use of ICT based resources hows that 13% of the respondents expressed that they did not know how to use this facility. From the study, it is suggested by the researcher that the library professional should concentrate on providing library orientation programme for all the students studying in the colleges.

Dhanavandan, S. et. al (2011) discussed in their study that majority of the respondent’s difficulty in accessing the internet were slow accessibility searching difficulties, browsing difficulties, obtaining connection and down 42 loading difficulties. Considerable levels of respondent’s problem in accessing the internet were opening web page and reliability.

Jing Li et. al (2012) in their study, explored the exact nature of patrons' usage behavior as well as their perception of ease of use and usefulness of print and electronic resources in the context of Chinese university libraries. A large scale survey was conducted and data were analyzed from 273 users. The study found that users are undergoing a transfer of usage behavior from print resources to electronic resources. This study advances knowledge about the current status of the use of university library information resources, helps librarians in Chinese university libraries understand the information needs of their users more specifically and provides some guidelines for the efficient and effective management of information resources.

Fatemeh, L. et.al (2013) carried out a study “An Identification of a Model for Digital Library Critical Success Factors” is established a comprehensive set of critical success factors (CSFs) that would enable successful digital libraries implementation. The results revealed six dimensions of CSFs and 36 potential success
factor statements contributed by the study participants. Based on these findings, this paper postulates that successful deployment of a digital library implementation may depend on set of success factors. The identification of these factors has important implications on digital library development.

Smita Pradip Patil, et.al, (2014) focused their study on effective percentage utilization of e-journals in the digital library. The study exposed that more than 60% of postgraduate students utilize the e-journals in the digital library to upgrade subject knowledge, Project, Preparation of the seminar, and research articles. The paper examines the various services which are used by the students.

Jhadav, H. (2015) explicated on digital library services. He mentioned the introduction of the digital library, technical services, traditional services, advantage and disadvantage of services, characteristics along with a description of components of digital library and software of digital library.

2.6 Conclusion

The review of related literature in the field of Digital Libraries. The felt that most of the reviews presented in general and specific terms. This research is covering journal papers, conference proceedings, and reports on different facets such as studies related to digital libraries.
References


