CHAPTER – II

REVIEW OF LITERATURE

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References
2.0 Introduction

Both a survey and a review of related sources of literature on the subject of the research are always helpful, and they are the first step to the designing of research study and also they are of great help in designing an appropriate methodology of study. The review of literature reveals assessing not only the length and breadth of the topic of research but also the vastness and depth of the subject itself. This will also help in identifying the gaps in the research. But very scanty attempts have been made to study in depth the specific aspect of library network in general and Engineering college library network in particular. The researcher has endeavored to go through the major basic studies made in the USA, UK and Australia. The detailed literature on the development of library networks in India has been reviewed and discussed.

For the purpose of collection of relevant sources of information on the topic the Library and Information Science Abstracts LISA (CD-ROM version) was used as the source document in this context and the period covered for this purpose was from 1975 to 2002. Further the review is presented here under appropriate headings that fall within the scope of this study. The information sources, particularly articles, are reviewed and their content are presented in chronological sequence under each heading.
2.1 Library Networks in USA and UK

Avaram and Rather (1979) describe various efforts of the US Library of Congress Office of Network Development, cooperating with other organizations towards the building up of an integrated resource sharing system. The activities discussed include the work of the Network Advisory Group, a group of senior representatives from network-related organizations invited by The Deputy Librarian of Congress to act in an advisory capacity to the Library of Congress (LC) Network Development Office; the Network Technical Architecture Group, a technical term established by the Network Advisory Group to link, via communication facilities, the organizations offering computer-based services, and to determine the configuration of the national database; the National Commission on Libraries and Information Services/National Bureau of Standards Task Force on Computer Network Protocol, a group formed to establish a standard application level communications protocol; and the LC National Authority Study, a study undertaken to assess the difficulty of extending the role of the authority file from maintaining a consistent catalogue for a single institution to maintaining a consistent catalogue cooperatively built by many institutions.

Townley (1984) describes the Online Database Information Network (ODIN), a multifunction microcomputer-based network with 8 members representing academic, public, school, and special libraries in 4 counties near Harrisburg, Pennsylvania. ODIN was established in 1982 with the
initial objectives of providing access to local databases, expediting interlibrary loans through electronic mail and providing access to commercially available databases. The author writes that these objectives have been realized and the administrative council of ODIN now plans to add a periodicals management system and further local and commercial databases to the ODIN package.

Deborah (1986) describes the WNCLN and basic routines performed on archive tapes to prepare them for a local system. The initial procedures are the same for single or networked institutions. Network considerations such as sequence of loading, master record, and AACR2 are discussed. A cost summary is appended.

Tuck (1988) opines that, since 10 years wide area networks have been based primarily on digital packet switching technology, in many cases using the ordinary analogue telephone as the user's point of access. This is the basis of most current on-line services. Now, however, a new and revolutionary phase is about to begin the circuit switched technology of the Integrated Services Digital Network

David and Lerche (1989) discusses the Research Libraries Group, Inc. (RLG), a nationwide consortium of research institutions which operates the Research Libraries Information Network, an information system and communications network that supports RLG's cooperative programmes as well as the technical processing and public services requirements of research
libraries. Changes in communications technology, in the regulatory environment, and in user requirements have led RLG to redesign its communications network. The goals, topology, hardware, software and protocols, deployment, and other related matters are discussed.

Schieber and Janney (1989) examined the current issues in Online Computer Library Centre (OCLC) regional networks in the USA. The report includes individual articles “Back to the future: regional networks keep evolving, helping libraries”, by Phil Schieber; “NELINET on cutting edge of training”, by Kriss Jenny; “Collection analysis is model for joint product development”, by Kriss Jenny.

Griffins (1990) discusses the Western Library Network (WLN) that reviews its members' original cataloguing for adherence to cataloguing rules MARC format standards before the records enter the database. The author focuses on Network level review at WLN, looks at the origins of the review process and how it has evolved with the growth of the Network and examines the review process itself.

Coyne and Mifflin (1990) opine that cooperative cataloguing has been accepted as a norm by libraries. Cooperative authority maintenance, however, has not been practiced widely. They examine the cooperative efforts of the Western Library Network and its members to maintain authority control over its central bibliographic database. The Authors describe the authority maintenance activities by WLN centrally, and WLN
member library's contribution and its efforts in updating its local on-line catalogue.

Michalko (1990) opines that the costs and new technologies are creating centrifugal forces that could compromise the viability and usefulness of central data resources such as Research Libraries Information Network (RLIN) and OCLC. Observations are offered on the changing nature of library and utility costs, the responsibilities for information technology implementation and the need for revised assessment of the uses made of central data resources.

Feijen (1991) describes the PICA Open Library Network project, which brings together a new network concept and a fully revised version of the PICA library system. Discusses the network (VTP and SURFnet), functional improvements (user interface, integration, intelligent bibliographic workstations, OPACs, and interloans), and the decisions affecting the implementation of the Open Library Network.

Cathro (1991) describes the history of the Australian Bibliographic Network (ABN) under the following headings: getting a system together; governance and consolation, the clients, the National Bibliographic Database, location, the authority control dilemma, standards, cataloguing and searching services, interlibrary loan subsystem, telecommunications access, products, cost recovery and charging policies, system development
and enhancement, and development. The author outlines strategic issues which the ABN will have to confront.

Amy (1996) explains that the Utah Library Network project undertaken established in 1992 to create statewide access for public libraries to the Internet. The author points out that the project was not only involves technology but also requires development of new human networks to reach its full potential. Reviews network expenditure according to six categories: connectivity, training, database licenses, state library expenditure and local library expenditure.

Yeats (1999) describes the work undertaken by the Controlled Access to Network Digital Libraries in Europe (CANDLE) project, by South Bank University, UK, as a successor to the CaseLibrary library management system architecture project. The objectives of CANDLE project include: to extend the Cactus access control system to all internal and external campus resources, especially distributed electronic periodicals resources; to facilitate access to electronic documents through cooperation with publishers; and to demonstrate the resultant software systems on a large scale at multiple sites. Further, he concludes with some details concerning the Cactus 2.0 architecture.

Roswitha (2001) discusses the performance indicators for the library's electronic services. Traditional performance indicators were meant for libraries with print collections and lending services. In several projects
and international cooperation, indicators have been developed for library networked resources and services. The author describes the problems of data collection and gives definitions for the electronic collection and the different steps of using electronic services.

Powell (2002) describes the International Network for the Availability of Scientific Publications (INASP) which is a global cooperative network that seeks to enhance the flow of information within and between countries, especially those with less developed systems of publication and dissemination. The author speaks out its objectives and looks at the nature of its publishing, library, library associations and research support.

2.2 Networks in Australia

Fjallbrant (1982) describes the implementation of the Washington Library Network software by the National Library of Australia for use in the Australian Bibliographic Network (ABN). The author briefly traces the development of ABN. The services and products offered by ABN together with the pricing strategy are described. Publications on ABN available from the National Library of Australia are listed and future plans discussed.

Byrd et.al. (1985) discuss the questions to be asked in setting up and operating a cooperative on-line library network using as an example the Triangle Research Libraries Network (TRLN) in North Carolina, USA. Discusses 5 factors: the history of cooperation; common interests; Title II-C
grants and other funding; the core of advocates; and the organisational structure. Lack of funds has been the biggest single obstacle to TRLN's progress. Others include: divergent interests; the balance of power; and a desire for quick results. They conclude that TRLN is now gaining momentum.

Harlen (1988) discusses the New Zealand Bibliographic Network (NZBN) which is a national on-line bibliographic facility provided on a commercial basis to member libraries throughout New Zealand, and it is based on cooperative participation. Describes the history of the NZBN, its objectives, the scope of the database, services provided, hardware, software, and plans for the future.

Waldstein (1988) discusses the SLIMMER a powerful information retrieval system, developed by AT&T's Bell Laboratories, and running on the UNIX operating system. SLIMMER supports the creation and maintenance of different but often interrelated databases and provides controlled access to these databases by users of the Bell Laboratories Library Network. Components of the system include: AT&T Personnel Database, Library Network Book Catalog, Book Acquisition System, Internal Document Database, Intellectual Property Control and Archival Databases.

Huan et.al. (1989) in their paper trace the historical development of the Australian Bibliographic Network (ABN) and its linking with other
regional networks into a national bibliographic network based on co-operative participation and the continued support of the Australian community. ABN has created a National Bibliographic Database as a vehicle for wider library co-operation. The development of ABN has been an outstanding success of Australian librarianship in the last decade.

Durey (1989) in his article describes the development of the New Zealand Bibliographic Network and outlines the dilemmas faced by developers in deciding on client costs. The author suggests that changes made over a period have had a negative impact on client or member library perceptions of the network.

Giaccai (1989) discusses how to share functions such as cataloguing and inter-library loans and other information centres by setting up a virtual network of microcomputers using TINlib software. Data exchange between 8 information centres is affected by using floppy discs, thereby creating a Floppy disk Local Area Network (FLAN).

Barbara (1991) describes that the Research Libraries Information Network (RLIN) is one of the major cataloguing utilities, offers a wealth of bibliographic information both in its on-line union catalogue and in its many specialized files. The University at Albany libraries participated in a pilot project involving faculty end-user access to RLIN. Barbara reports on the libraries' experience with the pilot project and the continuing end-user access program for faculty. Despite some reservations about the relative
user-friendliness of the RLIN search system, Barbara endorses the use of RLIN as an end-user database.

Chin (1999) examined the National Bibliographic Information Network (NBINet) in Taiwan is a bibliographic database established on 30 October 1991 and maintained by the National Central Library. In 1998, there were 26 member libraries and 70 non-member libraries in NBINet, which is considered to be a comprehensive database for Chinese studies worldwide and contains more than 1.6 million bibliographic records. The author discusses the problems encountered in the establishment of NBINet and the solutions related to computers and networks, NBINet’s utilization on the Internet, and user expectations of NBINet.

German and Rowena (2000) discuss the standard approach adopted in library networking or partnership models are neither developmental nor evolutionary, yet development and evolution are keys to robust, contextually responsive partnerships. Using a set of knowledge models first proposed by Owen and Wiercx, this paper argues for a new approach to the modeling of networks in which libraries enter at one point and then move along a continuum, ideally ending in an advanced, integrated knowledge environment model. The author opines that there is limited evidence to show that some library consortia in Asia are moving in this direction, but for the most part Asian consortia and networks are of the traditional, static variety.
Brimah (2000) opines that the libraries and Information Services (LIS) are being transformed by technology; consequently, LIS are having to adapt to meet their users' changing needs and growing expectations. The author states that included among the resource-sharing initiatives conceived by libraries in Swaziland is the creation of a computerised network or consortium of all LIS. Brimah reports on the preliminary investigations and formulations carried out to assess the feasibility or viability of such a network and evaluates the existing resources and facilities, affirms and confirms the perceived need for resource sharing and library networking, establishes present obstacles for library cooperation, and proposes a scheme or framework within which the network can be achieved for optimum use.

Ian (2002) says that the iNet is a collaborative project of the South Australian Public Library Network in partnership with the Council of Library Administrators of South Australia (CLASA) and PLAIN Central Services (PCS). It is a customizable information Web site which consists of a core element of organised links to quality information resources available on the World Wide Web as well as information about each library service in the state. A variety of administrator libraries across South Australia are involved in maintaining, updating and adding links to the site. Maintenance is facilitated via a password protected content management tool which enables administrators to make changes to their allocated subject areas and
The year 2003 found a major milestone in the history of Indian Universities that University Grants Commission (U.G.C) with the help of Education and Research Network (ERNET) and INFLIBNET has proposed a network called INFONET. The major objectives of this UGC-INFONET Indian Universities are able to access 4500 Electronic Journals covered Science, Social Science and Human disciplines.

Dastidar and Dastidar (1989) discuss the general features of the Educational and Research Network (ERNET) which will link the resources of the 5 Institutes of Technology, the Indian Institute of Science in Bangalore, the National Centre for Software Technology in Bombay, and the Department of Electronics in New Delhi. This will facilitate resource sharing, electronic mail, teleconferencing, database access, file transfer and financial planning among the institutions, and also improve the quality of education and research in India.

Viswanathan (1991) discusses the emerging standards for both bibliographic and the network based library services. The role of CCF has been illustrated. The service definitions and protocol specifications of the standards for inter library lending and search and retrieval of databases are briefly explained.

Viswanathan et.al. (1991) discusses the library networks in India. In 1986 a national policy on library and information system was formulated wherein it was recommended that the national libraries should form an
integrated system for a better coordination of their activities and services. The Planning Commission had set up a working group on modernization of library and information services for the Seventh Five Year Plan (1985-90) with a view to suggest measures to network important libraries in the country so that their resources could be shared for optimum utilization. The outcome of this was the UGC report on Information and Library Network (INFLIBNET) which proposed a mechanism to establish a network connecting universities, colleges, documentation centers, etc., in the country through the use of computer communication technology.

Selvi (1991) discusses the current technology in the library for local area networks. Over the past few years, the development of local area networks (LANs) has been rapidly advancing and is expected to remain so in the future also. The four main technological aspects essential for LANs, viz., transmission medium, topology, transmission technology and access control method are dealt with in detail. Finally, the importance of application of LANs in libraries is described.

Baruva and Saibaba (1992) conducted a survey of 162 engineering and technological libraries in India to determine the need for final channel of cooperation. The authors suggest a design and recommend a cooperative networking science for optimum use of research.

Laxman Rao (1993) discusses the networking and communication of information. Information is the sixth basic need of human beings. The
quality of information increases its value. The latest technological developments provide an opportunity to improve information communication. Information Technology (IT) is a result of the convergence of computers and telecommunications. Developments in IT had resulted in networks such as Local Area Network (LAN), Metropolitan Area Network (MAN), Wide Area Network (WAN). A brief account of networks in India is included.

Mohandas and Shet (1995) lay emphasis on network integrated services such as requirement analysis, design analysis, protocol services. The networking needs planning, proper installation, testing and maintenance etc.

Upendra Rao and Rama Reddy (1995) discuss the network challenges. The authors touch the various networking components, network design and problems in development of networks.

Gupta et.al. (1997) in their paper propose a model for the creation of the Roorkee Engineering Library Network, based on 6 research libraries, including, Roorkee University and KTI Polytechnic. The author reports the results of a questionnaire survey of these libraries to gather data about their computer facilities. The proposed library network is based on a local area network (LAN), which is similar to DELNET, PUNENET, CALIBNET and SIRNET.
Baba (1997) opines that the computerized library network at regional level is found to be most appropriate for enhancing library service standard. Such a networking system is greatly felt in Jammu and Kashmir. The author discusses in depth the establishment of such programmes, namely, Jammu and Kashmir Library Network (JAKLIBNET) for Jammu and Kashmir to work for betterment of library services in this area.

Bhaskar and Raina (1997) proposes the networking of management education institutions in India. Today's management graduates, irrespective of the specialization, cannot escape the information technology revolution that is taking place in the corporate sector. The business themselves have to move on to the information age to stay competitive in the global economy. Thus, such an effort of networking among the management educational institutions will address the need of the hour, i.e., the improvement in the quality of the management education through resource sharing.

Chandran and Reddy (1997) discuss the automation and networking efforts of Sri Venkateswara University Library (SVUL). They present the experience and problems faced in the procurement of hardware, site preparation and database creation. They also list future plans of SVUL towards library automation, suggests steps to be taken by INFLIBNET to make the programme a success.

Deshmukh (1997) examined the importance of library networks for sharing of information resources has been felt for a long time, many
networks both international and national have been established is in
operation for quite some time. The author enumerates the networks, their
types and discusses briefly about a few networks in USA, Canada, Europe
and India.

Deshpande (1997) proposes the networking of libraries in Nagpur
city. On the lines of metropolitan networks like DELNET, CALIBNET,
MALIBNET, BONET, PUNENET etc, a network of libraries in Nagpur
city. The necessity of networking, different approaches to library
networking, participation strategies, networking hardware and software, and
financial implications have been discussed. The author also mentions
general and specific objectives of Nagpur Network (NAGNET), the
consortium established by the founder members, different phases of
implementation, standardization and retro conversion of library holdings etc.

Jain and Rai (1997) briefly outline various education and research
networks in India such as NICNET, ERNET, INFLIBNET, SIRNET,
INDONET, OPENNENET and their main objectives.

JanardanaRao et al. (1997) define the concept of local area network
and wide area network, discuss network options; describe the network
option facilitated at the Andhra university library, details the hardware
configuration installed in the Andhra university library, and desire to share
its database with the databases of other libraries.
Kaur (1997) highlights the need and importance of resource sharing in the agricultural libraries and describes, in brief, a plan for developing a network of the libraries of agricultural universities and research institutes in the states of Punjab, Haryana and Himachal Pradesh (PHHALNET).

Maheswarappa and Tadasad (1997) critically examine the issues in development of collection for libraries in the context of electronic publication and networking with special reference to formulation of policies, users, formats, storage, mode of access, selection, acquisition, bibliographical control, finance, evaluation and manpower. They conclude that developing a need based, relevant and cost effective collection, consisting of electronic and other publications in document form, requires a systematic planning and an effective implementation.

Potdar and Joshi (1997) proposed the library network for Amaravathi university region. The authors explain the concept, need and objectives of networking, Enumerate components of library networks, and propose a library network for the Amaravathi university region for sharing and improving the services.

Salgar (1997) discusses the computerization and networking of libraries in the light of developments brought out by IT. He describes briefly government data networks such as ERNET, NICNET, I-NET and GIAS. The author briefs the network services, including catalogue based services,
document delivery services and communication based services such as E-mail, bulletin board and referral services.

Singh (1997) discusses the growing usage and the advantages offered by CD-ROM in meeting user requirements. He describes CD-ROM networks and different network architecture like peer-to-peer, dedicated servers, network loadable modules and file server extensions along with their benefits and their drawbacks.

Goria and Kumar (1999) discuss the present status of SAV and ICAR substitute libraries, the need for networking of SAV and ICAR libraries. The authors also highlight the problems and possible solution of computerization, networking of SAV and ICAR Institute Libraries and selection of hardware, software, training of staff and retrospective conversion.

Krishna (1999) discusses Internet technology and features of Internet and intranet. List out the implication of these technologies.

Rao (1999) highlights the networking scenario in India by listing the general communication networks, viz. INDONET, NICNET, GPSS, RABMN, I-NET, and specialized information networks, viz. ERNET, INFLIBNET, BTISNET, DELNET, SIRNET, CALIBNET, MALIBNET, MYLIBNET, etc. The author concludes that India has drawn up ambitious plans and it remains to see the benefits that could be derived from
employing these facilities in improving the socio-economic status of its citizens.

Tyagi (1999) discusses the resource sharing and networking. Resource sharing is based on the concept that the collective strength and effectiveness group of libraries is greater than that of its member taken individually and then added up. The author points out the objectives, protocol, file server and transmission media, topology and network operating system. The author discusses the selection of network criteria and service.

Kaul (1999) opines that resource sharing technology is becoming more perfect and user friendly in the networks where the participating libraries either the same software or the protocols. The inter library loan pattern is bound to change drastically in the years to come. The necessary steps should be taken in this direction as early as possible.

Mishra (1999) presents that the library networks in India are at different stages of development. Most of the participating libraries in the library networks are either fully computerized or partially computerized. In fact, in the process of computerization of these libraries, one cannot find any sort of standardization or uniformity in the use of software, record format or subject heading lists. Thanks to the developments in the area of computer technology, uniformity in practice is no more the essential component for successful network.
Munshi (1999) opines that in order to realize the vision of effective library management systems, good software, besides the hardware, is a prerequisite to automate day-to-day functions and participate in networking projects.

Rao (1999) opines that modern technology and communication networks have substantially increased the output of published work. As a result, no library can receive, process or store all the documents that its user need. No library can afford to acquire even half of all the published materials, both in terms of cost and time required to process and provide access to a burgeoning quantity of information. The limitations of funds and space, besides the lack of effective distribution channels for publication and lack of proper book selection tools, handicap libraries. These limitations, therefore, over the last centuries necessitated the need for library resource sharing.

Ashoor (2000) describes the various technological and social requirements for planning the electronic library. The requirements include the LAN and client-server architecture, facilities for storage and access, facilities for archiving digital information, establishing priorities in building the network information resources, by introducing the necessary changes in library organization and services, and also by providing a comprehensive user training programme.
Singh (2000) deals with the concept and scope of library resource sharing as understood today. He discusses the requirements and various problems in the way of resource sharing. The author also discusses the impact of IT on library resource sharing. His study throws light on implication and complications is Indian traditional environment regarding sharing of library resources in network environment.

SubbaRao (2000) discusses CD-ROM as a provider of multiple, simultaneous and remote access to a large amount of information such as abstracts, full text, directories, education materials, music etc. that are available to increase access to a CD-ROM collection and commonly used CD-ROM networks under LAN viz. peer to peer, file server, client server and optical servers. The author concludes that a careful study of the pros and cons of establishing a CD-ROM network has to be weighed in terms of cost and usage.

Mishra (2001) states that the India has seven local library networks and a national library network (INFLIBNET). However, these networks are in differing stages of development. Most are at a preliminary stage, although the earliest efforts in this area took place in 1989. The author presents here the results of a survey on factors affecting the development of local library networks. Participating libraries in four networks were administered a structured questionnaire. The study reveals that organisational factors such as planning, governance, funding communication and delivery, and
administration are related to each other. Moreover, many factors are highly
dependent on each other. The author observes that the library networks
should try to raise the levels of awareness among the participating libraries
in order to develop the local library networks successfully.

Arora (2001) describes a proposal for a strategic cooperation for the
consortia based access to electronic resources, which is called Indian
National Digital Library in Engineering and Technology (INDEST). The
INDEST would function as a consortium of engineering and technological
libraries for building up a core digital collection in engineering and
technology. It would host a variety of web based digital resources.

Singh (2001) discusses the Indian Institute of Technologies (IITs)
which have been recognized all over the world as centers of excellence in
learning, training and research in the fields of engineering and technology.
The author covered the different aspect of hardware, software, application,
databases, CD-ROMs, online search services, networking and marketing of
products and services.

Sirurmath (2001) describes the theoretical and practical explanation
of the electronic library and its information retrieval and service for a special
reference to the management institution library. The author also highlights
the e-library, CD-ROM networking, Internet and web resources services and
legal issues.
Ganesan and Srinivasulu (2002) discusses the network based information services in the University libraries. Network based information services have become more useful, affordable, available and useable. In the network based information system, user can work simultaneously with multiple distributed information sources that differ in content, form and source types. The author discusses the network, Internet, Internet resources and services to the user community and remote users also.

Cholin and Karisiddappa (2002) discusses the academic libraries in India which have been affected by an uncertain financial environment in which resources buying has been restricted, causing them to look for a way of extending their purchasing capabilities to compensate for reduced budget. The author also highlights some of the important consortia arrangements at the International level. The proposed model for academic libraries through different vendors / publishers has been discussed.

Juttiyavar (2002) describes virtual private network (VPN) and its use in libraries for a secure way of transferring information and data to their members. The author explains the advantages, and presents the status of Virtual Private Network (VPN) implementation at MASTEK.

Singh et.al.(2002) discuss the security threat perception to a digital library. Internet technology has benefited the users and research and development library by providing effective and quick sharing of global
information resources. The author also discusses some security measures for managing and maintaining the local network.

Identifying the need for library networking, Bachalapur et al. (2002) propose a engineering college network for Visvevaraya Technological University, Karnataka. The similar efforts were also done to propose a engineering college network for Andhra Pradesh by Ravi and Srinivasulu (2002).

Chandrakar et al. (2002) explains the digital divide and the INFLIBNET bridging the digital gap of academic libraries in India. The centre is directed towards modernization of libraries and information centres with the aims of establishing a mechanism for information transfer and access to scholarship, learning and academic pursuits. The objective of the centre is to establish a national network of libraries and information centres, including universities, institutions of higher learning, research and development, sharing and its utilization of higher learning, research and development, sharing and its utilizations at national the level. Till date, 142 university libraries have been financed to establish the necessary infrastructure for computerisation of their libraries and link them through network. More than 600 staff members have been trained through a series of workshops, training programmes and on site training across the country.

Rath (2002) discusses some of the critical issues concerning success of library and information networks such as developing information...
infrastructure and formulation of information policy at the national level. The paper further elaborates the components and technological characteristics of information infrastructure issues involved in formulating a national information policy. The author concludes with the statement that in spite of all these barriers a global library / university library is going to emerge at the international level.

Satishkumar and Jayaraman (2002) discuss the benefits of sharing CD-ROMs/DVD over a network and introduces devices called CD libraries / servers for sharing CD title over a network. It takes a look at architecture and available technologies for the above purpose, and concludes by giving an overview of technologies and facilities available at LRDE library.

Singh (2002) proposes the library cooperation among power sector libraries in India, the model library network called Power Library Network (POWLIBNET). POWLIBNET will be a cooperative network based on computer communication meant to improve the capability of resource sharing and information access to power sector community in India.

Vijayakumar (2002) describes the virtual private network can significantly play the role of resource sharing, improve the global connectivity, and provide new capabilities such as secure, easy and flexible extranet communications among the librarians who wish to share their resources.
Cholin et.al. (2003) discuss the University libraries in India which are facing the challenges to meet the user requirements due to various reasons viz. experimental growth in literature, price escalation, budget restrictions etc. on account of which resource acquisition has been restricted. This situation has paved the way for serious thinking on the capabilities to compensate reduced budgets. In this study, an attempt has been made to address the trends in resource sharing and various issues involved in e-subscription.

Ghosh and Jambhekar (2003) propose the plan for the establishing of library network or consortium of management and engineering libraries of two western Indian States Gujarat and Maharashtra. The author discusses the advantages and disadvantages of this form of collaborative approach between management and engineering libraries.

Vibhuti (2003) proposes the networking for agricultural libraries and information centres. In his article an attempt has been made to find out the need for the resource sharing in agricultural libraries and information centres, and a model for the setting up networks of agricultural institutions and their research organizations is suggested. He also suggests the ways of improving the methodologies in order to cope with the rapid developments of information and communication technologies in the field of agricultural science. The method of implementation of the network model is also
discussed in phase wise to achieve more effectiveness in providing the services to the agricultural community.

Sankaran (2003) discusses the requisite organisational conditions for networking and some recent technical developments in making possible a seamless network of libraries. Such a network of mutually shared resources, the paper argues, would be a sine-qua-non for the making of a civil society.

Gulati (2004) discusses the status of information and communication technology usage in Indian libraries with special reference to special libraries and efforts made by various institutions to propagate e-information products and services. It highlights the consortia efforts in India, like JCCC consortium, INDEST Consortium and UGC Infonet.

Ramana (2004) describes the efforts of Chhatrapati Sahu Ji Maharaj (CSJM) University, Kanpur in implementing the library automation and networking supported by UGC grants, the working conditions and the present state of affairs of the library. A few suggestions are made for the university libraries based on the observations made by the author at CSJM University.

Balsubramanian et.al. (2005) discuss the networking and other security aspects in libraries. They say that the libraries are to be networked so that a distant client and that particular library can access the details of the library. These can be done by having shared cataloguing, union cataloguing, document delivery services, inter library loan, e-mail, bulletin board, current
awareness services and online public services. Network security ensures the balanced work of libraries.

Bhattacharya (2005) in her article explains the networking and consortia techniques. The ultimate vision of resource sharing through networking of libraries posits a completely digital environment in which the user identifies the required resources in electronic form through a comprehensive system of metadata and then simply connects it without knowing where it resides.

Francis (2005) discusses an approach towards partnership, networking, consortia and resource sharing adopted by Indian libraries which needs radical changes to evolve responsive partnership. The author depicts the benefits of library consortia, analyse the present trends in the formation of consortia in India and also suggests a new model of library consortia in which all academic institutions and government research organizations could participate. The role that can be played by the INFLIBNET centre of the University Grants Commission in the formation and management of such a consortium is also depicted.

Gonsai et.al. (2005) present wireless networking scenario with standards and policies for its implementation. The authors also discuss the security aspect of WLAN, cost consideration, different types of network set up for different need.
Jange et al. (2005) discuss the information and communication technology in transforming the society, education, business and the economy. The library managers must understand these changes in order to position their organizations to flourish in the networked environment to provide effective information services to the users. In the local area network (LAN) world, an attempt has been made to describe the network establishment in Gulbarga University and their experiences to enhance the techno-based services to the users.

Jayaprakash and Bachalapur (2005) discuss the consortia developments in library and information centres. Due to increase in the cost of journals, dwindling library budgets and proliferation of electronic information resources, libraries have been involved in cooperation, coordination and collaboration in resource sharing. The authors present the consortia developments in the library and information centers in India.

In a step ahead INFLIBNET also took the initiative to network a Government College libraries in Andhra Pradesh (The Hindu, 2005) in the south India. Jammu and Kashmir was the first in the country to bring all its Government College libraries under a network.

2.4 Research Libraries Network

Huck and Huck (1979) examine several pre-conditions for the successful implementation of cooperative projects which exist in the ASEAN (Association of Southeast Asian Nations) countries of Indonesia,
Malaysia, the Philippines, Singapore and Thailand. These are the spirit of cooperation, leadership, organisational structure, manpower resources, technological capability and experience in cooperation. A proposal is made for the establishment of a Southeast Asian University Library Network (SAULNET) as the forerunner of SEANET (Southeast Asian Library Network). A survey of ASEAN university librarians shows that they are more favourably disposed towards certain kinds of regional cooperation, such as the creation of a union list of serials and interlibrary lending, than towards cooperative projects involving share cataloguing and cooperative storage. The developing Malaysian National and University Library Network is also examined as a possible model for SAULNET, some theoretical network models are outlined; and some proposals for resource sharing in SAULNET are also made.

Hawkins (1980) describes the on-line searching function in the Bell Laboratories Library Network (USA). A 'hybrid' model is used, with both centralised and local services being provided. Hawkins opines that on-line searching has brought about many changes in the areas of information retrieval patterns, communications, training, marketing, and dissemination of search results and presents statistical data for 1974-79. The author opines that the list of heavily used data bases remained remarkably stable.

Byron (1982) examines the changing involvement of the Australian National Library in the Australian library scene, with reference to its
establishment of the Australian Bibliographic Network (ABN), and an on-line shared cataloguing system. The author discusses the present capabilities of ABN, its potential for resource sharing, and its influence on the quality of Australian cataloguing and describes the controls available both in the system itself, and through the management structure proposed for it.

Kruger (1985) says that the New England Library Information Network (NELINET) and OCLC began at one and the same time with almost identical objectives: to create a shared bibliographic database based on the use of the newly available machine-readable tapes from the Library of Congress and contributed cataloguing from member libraries. The article traces NELINET's development since its beginning and uses the events of its history as stepping stones from which to explore important issues in library network development: the early and continuing economic imperative for cooperative efforts in automation; issues of funding, governance, and organisational structure; and the evolving role of regional networks and their relationship to major nationwide networks such as OCLC.

Gibb (1986) describes ELAN installed in Strathclyde University's Department of Information Science in November 1985. The author discusses its effect upon the administrative operations, teaching and research and the problems associated with installation, software and operating in an educational environment.
Tonee (1986) opines that the Research Libraries Information Network (RLIN) is one of the largest cooperative, automated information systems in the USA. RLIN supports the principal programmes and the technical processing requirements of The Research Libraries Group Inc. (RLG). He also discusses the RLG/RLIN concept, the distinctive RLIN features, electronic card catalogue, database depth; technical processing, special databases on-line; tape loaded contributions; the active enhancements agenda, ongoing enhancements of languages; and access modes.

Kilbirige (1989) describes the Integrated Services Digital Network (ISDN) which is essentially multi-type and promises to add a new and vital dimension to on-line information retrieval systems. The author discusses the implications of ISDN for information professionals.

McCallister and Gregory (1992) describe the setting up of the Western North Carolina Library Network to facilitate library cooperation between 3 university libraries located in the mountainous regions of North Carolina; Appalachian State University, North Carolina University at Asheville, and Western Carolina University. It describes the network structure; cooperative projects within the network, the common database, ABC express van service, union list of periodicals, government documents union list, proposal to load US Government Printing Office magnetic tapes of cataloguing records, lending of reference materials, direct patron
borrowing, and cooperative collection development. Problems facing the Western North Carolina Library Network include: finance; distance; location of the computer and network coordinator, and communications.

2.5 Scientific and Information Network

Middleton (1983) outlines the present status of library automation in Australia. The author provides the necessary background for an exploration of issues arising when local network operations consider their relationship with the national Australian Bibliographic Network, and further some specific aspects of linking the concerned regional networks such as CLANN and CAVAL, with particular reference to provision of service, standards, network technology, contractual framework, economics and governance.

Bohley (1984) discusses the installation of the first Libraries of the University of Missouri Information Network (LUMIN) public access terminals in the Curtis Laws Wilson Library at the University of Missouri-Rolla (UMR) and its suitability as a test site for the on-line catalogue focussing on terminal placement, equipment selection, site preparation, furniture, mode of the system operation, library staff adaptation, user response and appropriateness for the needs of UMR Library.

Joho (1986) discusses Japan Information Center for Science and Technology (JICST), and concludes a cooperation agreement with Chemical Abstracts Service (CAS) and FIZ Karlsruhe regarding the Scientific and Technical Information Network (STIN). STIN acts as an information
channel between database producers on usage trends and for joint software development. JICST is participating in STIN both to encourage the use of Japanese databases in the West and to help Japanese users to access western databases.

Kumarnayake (1986) reviews some of the resource sharing initiatives taken in Sri Lanka ever since the establishment of the Sri Lanka Scientific and Technical Information Centre (SLSTIC), and the formation of the Sri Lanka Scientific and Technical Information Network (SLISTNET), to the range of cooperative programmes which have emerged from the pioneer scheme. The work of the Centre for Development Information, Ministry of Finance and Planning, in coordinating resource sharing in the socio-economic fields is also discussed briefly.

Copeland (1988) describes the planning and process of the retrospective conversion of serials at Colorado State University Libraries (CSUL) on RLIN (Research Libraries Information Network). The author has laid emphasis on some of the special features of RLIN that are useful for searching and editing adaptive (derivative) records, including the capability of RLIN to display several similar records for the same title.

Lankkenau (1993) describes the Scientific and Technical Information Network (STN), which is one of the largest online information systems in the world, and was founded jointly by the Fachinformationszentrum (FIZ) Karlsruhe and Chemical Abstracts Service.
in 1983 with the aim of processing, storing and disseminating scientific and technical information. The author discusses the work of FIZ with special emphasis on its database production, bibliographic services and information services. STN, which is represented in Prague by Medistyl, and offers a discount up to 80 per cent on the selected databases to users in Central Europe.

Martey (2002) discusses the management issues involved in library networking, using GILLDDNET, the DANIDA/IFLA sponsored Ghana Interlibrary Lending and Document Delivery Trial Project as a reference point in the discussion. There is an attempt to apply the management principles that Urwick outlined decades ago in the Elements of Management to this project. The author discusses the challenges and the successes of the project.

2.6 University Library Networks

Dougal and Stokes (1986) conducted a trial search on the data base of the Research Libraries Information Network (RLIN) in the USA. The aims of the search were to test the percentage of cataloguing copy retrieved for material in Asian languages, to evaluate the usefulness of this copy for cataloguing at the Australian National University (ANU), and to provide data for use in assessing the cost effectiveness of a regular RLIN link-up. Catalogue records were sought for items in all the main Asian languages of ANU Library's collection. For South East Asia, the test included
monographs in Indonesian, Malay, Tagalog, Vietnamese, and Thai and for South Asia it included monographs in Sanskrit, Tibetan (non-modern), Hindi, and Bengali. Although the library's collection contains materials in such languages as Burmese, Javanese, Arabic, Persian, and Tamil, these were not tested because of constraints of the staff and time. The East Asian samples covered Chinese, Japanese and Korean but not Mongolian or materials in other languages held in small quantities.

**Bales and Tucker (1988)** discuss the database of the Research Libraries Group's Research Libraries Information Network that contains some 25 million records in all USMARC formats for bibliographic and authorities data, as well as a number of additional files for specialised data. These records include source data from the Library of Congress and other national bibliographic agencies, and the records contributed by RLG member institutions, and used both for technical processing and in support of RLG's cooperative programs. Chinese, Japanese, Korean and Cyrillic vernacular records are included in the central data base; work on Hebrew is in progress. Future developments will result in the addition of diverse kinds of data, including non bibliographic data, to RLIN.

**Sandlin and Sandlin (1990)** in their paper presented at the 4th Annual Conference of the North American Serials Interest Group (NASIG), Scripps College, Claremont, California, 3-6 June 89, discuss in detail the application of CD-ROM data bases by PALINET (Pennsylvania Area
Library Network), a cooperative bibliographic service of over 300 libraries, of all types, in Delaware, Maryland, New Jersey, Pennsylvania, and the District of Columbia. Statistics for the numbers and types of CD-ROM products subscribed to by PALINET users are also reported. 45 libraries subscribe to 103 Silver Platter databases and 36 libraries subscribe to 106 Wilson databases. Subscriptions to CD-ROM are analysed by library type showing the fraction of total libraries using CD-ROM (Academic libraries 58 (35%), public libraries 10 (18%), and special libraries 7 (9%)).

2.7 Other Networks

Nayakama and Toyama (1979) say that the satellite-type networks, intended to be developed eventually into a resource-sharing network, began to take shape around Inter-University Large-scale Computer Center. As the networks were developed, the burden of computer came to be shifted to on-line systems. They describe the current data base service in Japan and the Inter-University Science Information Network and its functions.

Chepesiuk and Tarlton (1983) describe the creation of the Southeastern Library Network (SOLINET), which now includes over 300 member institutions from 10 southeastern states and is the largest of the 22 regional networks that contract for OCLC services. They illustrate the impact of SOLINET through the operations of one of the member institutions, The Winthrop College Library, Rock Hill, South Carolina. The introduction of SOLINET has allowed the library administration to shift the
personnel from technical services to public services, which now offer bibliographic instruction and on-line database searching, and to reduce the number of professional staff in the cataloguing department. They estimate the cost of the library network participation and hints at plans for the future.

Ziegman (1988) opines that over the last decade, networks such as the Western Library Network (WLN) have faced an ever-increasing number of the number of challenges to their viability. These include rising telecommunications costs and increasing local processing power. WLN has responded to these challenges in several ways. WLN will continue to offer a high quality, centrally maintained database, with special emphasis on providing an accurate linked authority file. In order to further promote this goal, a Cataloging/Inputting Service and Sample Review programme for original cataloguing input by members have been implemented. Service area restrictions have been removed to encourage use of WLN throughout the West and beyond. Finally, WLN has developed LaserCat, a CD-ROM based catalogue containing over one and a half of the WLN database.

Marshall (1997) focuses on designing a library network to maximize security. He considers various options, including separation of staff servers from public servers, subdividing the network using a router, multiple hubs and public access ethernet ports, ethernet switches, ATM environments and firewalls. Also he evaluates the security of each against the impact on functionality.
Yang et.al. (1998) describes the major objectives in establishing the China Education and Research Network (CERNET). They describe the major goals, the topological structure, the organisation of the network and the application systems of CERNET. They describe in detail current applications in library and information services on CERNET.

Khalid (2000) says that the cooperation and networking in library and information systems provide a wider access to collections, improve public and technical services and enhance operations by sharing of resources reducing duplication and offering more cost effective services.

Tobbetts (2000) evaluates the impact of information technology requirements on the cost of electronic libraries. The fast pacing developments of technology require continual updating of hardware and software, and networking access consists of initial costs and recurring expenses. Electronic content, training and support all demand recurring expenditures in this environment institution, which must budget accordingly.

Hider (2004) examines some of the bibliographical advantages of a union catalogue with a central databases over a distributed or a virtual union catalogue. He discusses the nature of these advantages in the context of inter library document delivery and also describes the circumstances which produce them and make it more significant. He also reports on a brief study of the extent to which two major library catalogue in Singapore have diverged, following the adoption of a distributed model. This indicates that
the bibliographical control of a distributed union catalogue may be significantly poorer than that of the central databases, particularly in terms of more duplication, inconsistency, errors, and omissions.

Nasiruddin (2001) makes survey of the existing libraries in Bangladesh and Thailand, shows the current status of networking and resource sharing systems and services. The author also designs the future plans of action for achieving goals. Further the author explores networking system in Thailand and Bangladesh focusing on the databases and online information attributes which are the key resources to be shared by network management.

Dong et.al. (2002) discuss the intellectual property right problems of peer-to-peer network, in order to deal with the potential digital piracy to avoid similar litigation. If libraries can embrace peer-to-peer technologies into their own services, they will possibly develop new service model or improve the existing ones.

Potts (2003) says that the people's network provide a powerful delivery mechanism for e-initiatives, public libraries have opportunities to utilize the network beyond the standard provision of public Internet access. The author also examines, how the challenge of channeling content to all libraries in England through a single interface and across a diverse set of library network is being approached by the people's team at resources.
The contribution of networking technology for a library is significant. The need for proper administration and security for the library LAN is important as against the contacts (Joseph, 2003) and et al, discuss about the method and issues of network administration in a library followed security methods to be adopted on various level in order to protect the contact from hackings and unauthorized access.

Khalil (2004) presents the advantages and disadvantages of using wireless network laptops as well as barriers to use them in higher education. A special new update on wireless network security will be included. Guidelines for implementing wireless laptops in higher education are also discussed.

2.8 Conclusion

The information scattered in various sources shows that even though there has been a lot of research in the related area, still some lacuna are found. So, the related literature has shown a path for further research in the field. This has helped the researcher to frame a design for his research.

Academic libraries have long desired one stop shopping for their customers and in this electronic age, their customers are demanding in a way to search from a single point at any physical location and to retrieve information from the library catalogue, citation from journal indexes, and full text information from electronic resources. The one system, one library concept by working together as coordinating university library system will
provide students, faculty, and citizens with access to truly great library collection and to a global network of electronic information resources.
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