CHAPTER III

Literature Review
3.1 INTRODUCTION

For many years librarians have been promoting library cooperation and the literature on the topic is growing at a speedy pace. To have a thorough understanding of the subject, the library cooperation, it is necessary to study the various aspects of library cooperation. Thus, this chapter makes an attempt to review the existing literature on the aspects such as historical overview, definitions of library cooperation, library resource sharing and library networking. In addition, this chapter also provides an overview of cooperative trends in various developed and developing countries.

3.2 HISTORICAL OVERVIEW

The concept of library cooperation is deeply rooted one. "Libraries have a history reaching back into antiquity, and no doubt the custodians of the ancient libraries of papyrus and the keepers of Monastic collections had their schemes of cooperation". We do have some evidence to indicate that the library at Alexandria loaned books to the library at Pergamum around 200 B.C. Several authors have revealed
the beginning of cooperation in different times. According to J W Kraus cooperation can be traced back to 13th Century.

Inter library loan is one of the oldest activity of library cooperation. Informal agreements of lending and borrowing of library materials have been in existence since the Seventeenth Century in Europe. Gravit indicated that, a French humanist, Nicolas Claude Fabride Peirese, attempted to establish a kind of inter library loan service between the Royal library in Paris and the Vatican and Barberini libraries in Rome.

In the United States, 1876 is considered the beginning of librarians' effort to establish a viable inter library loan service. Staurt-Stubbs surveyed the efforts of the American library leaders to create an effective inter library loan system and a national lending service. At the American Library Association 1876 conference one of the first actions taken was the formation of the cooperation committee under C A Cutter and concerned mainly with cataloguing. Gordon Williams opines that the" history of inter library lending has not, to my knowledge, been exhaustively studied, but regardless of when the first inter library loan may have occurred," the practice did not become common until about 1917 when the American Library Association adopted its first inter library loan code for the guidance of United States Libraries. Staurt-Stubbs reports that the code was proposed
by Samuel Green in a letter to the Library Journal in Sept, 1876.

In India, although, theoretically the idea of library cooperation is quite familiar to the library professionals, in practical terms not much has been done in this direction. The efforts made by librarians to benefit themselves by mutual help have for a long time to try cooperative activity more or less at local level, rather than at regional or national level. An experiment in library cooperation first started in Punjab in 1963. It was called the Regional Cooperation Group. Its chief aim was to deliberate and discuss through its periodical meetings so as to decide ways and means of reducing expenses on library materials and provide improved library services through cooperation and taking effective steps for updating the knowledge of working librarians through conferences, seminars and workshops.

3.3 DEFINITIONS

Various definitions and explanations have been given for the concepts of "Cooperation and "Networking". The present analysis of the literature shows that the term "network" has become fashionable in the library literature since the mid 1960's, but its concept dates back at least 100 years, from a long tradition of library cooperation. In general, library cooperation is a joint effort taken by two or more libraries
to improve their resources and to provide better facilities and services to their users and decide ways and means of reducing expenses on library functions.

10 Immroth points out the words "Cooperation" "centralization" "Consortium" "Network" and "Resource Sharing" could be used as synonyms or interchangeably. However, Becker distinguishes between the inter library cooperation and library networks. He explains "The crucial difference between inter library cooperation and library networks lies in the area of organization. Until now libraries were organized essentially as separate entities, and for the most part, they cooperated with one another to the extent that it did not interfere with local obligation. Library networks on the other hand, are something else. They imply interdependent, rather than independent organization, they imply intermembrai, rather than individual decision making, and they imply extra-jurisdictional responsibilities rather than only local ones".

12 Louis Kaplan expresses another point of view, he defines library cooperation as "the furthering of mutually advantageous projects or programmes, agreed by librarians". He also indicates the organizations that promote or administer cooperatives as "systems" or "Consortia" and asserts that "the custom is being established of referring to
Murkuson has distinguished three levels of library cooperative activities as follows:

**Library cooperation**: Library cooperation is "Any activity between two or more libraries to facilitate, promote, and enhance library operations, use of resources or service to users"

**Library Consortium**: Library consortia referes to "A specialized type of library cooperative activity usually restricted to a limited geographical area, number of libraries, type of library, or subject interest. Some degree of formalization of administration and procedure is required. In general, programmes require moderate funding. A formal consortium staff is optimal, when required, staff is usually quite small".

**Library Network**: It is "A specialized type of library cooperation for centralized development of cooperative programmes and services, including use of computers and telecommunications and requiring the establishment of a central office and a staff to accomplish network programmes rather than merely to coordinate them. Programmes require significant funding and usually formal contracts are required between users and the network. which is, in most cases, a legally established corporate entity".
Some authors also use the term "library network" to imply the use of computer and telecommunication technology. For instance, Butter gives a definition of library network as follows: "A library network is seen as defined by four characteristics: it is dependent organization and system providing duplex digital distribution.

Stevens also defines a network as "a formal organization of three or more autonomous organizations interconnected to achieve their common purposes through the joint use of communications and computer technology.

Resource Sharing: According to Allen Kent "Consortium, network, and cooperation are the terms used to label the organizational arrangements for achieving a variety of resource sharing objects. He explains that the term "resource" applies to anything, person or action to which one turns for aid in time of need. When the term used alone, it is not necessarily seen as implying reciprocity. The word "sharing entails apportioning, allotting or contributing something that is owned to benefit others. "Resource sharing" in its most positive aspects entails reciprocity, implying a partnership in which each member has something useful to contribute to others and which each is willing and able to make available when needed."
He further asserts that "Resource sharing denotes a mode of operation whereby functions are shared in common by a number of libraries. The goals are to provide a positive net effect: 1) on the library user in terms of access to more materials or services; and/or 2) on the library budget in terms of providing level service at less cost, increased service at level cost, or much more service at less cost than if undertaken individually. These goals should be realized without harm to the missions of participating libraries, although their methods of operation invariably must be adjusted. Similarly, the goals are realizable only with some changes in the habits of users".

3.4 NETWORK STRUCTURE AND GOVERNANCE

The structure of library networks can be described in terms of the structure of computer networks. However, an important difference between library and computer networks is in the operations/functions they perform. Several authors have discussed network structure in terms of network flow theory. Allen Kent distinguishes three types of resource sharing network, they are Star, Hierarchical, and distributed.

1. STAR NETWORK STRUCTURE

The star network entails one network member holding substantially all resources, with all other members utilizing these resources.
2. DISTRIBUTED NETWORK

This network is composed of members with equal, but different resources, with all members able to call directly on the resources of all other members.

3. HIERARCHICAL NETWORK

This hierarchical network entails members sharing resources locally, passing unsatisfied needs along to the next greater resource centre.

19 Williams and Flynn specify four types of network structures, they are 1. Totally centralized (star) 2. Totally decentralized 3. Distributed centralized and 4. Hierarchical.

20 Rouse and Rouse also discuss four common network configurations: Star, distributed, ring and hierarchy, which can be applied in both computer and telecommunications fields as well as the library area. They describe each configuration and discuss its advantages and disadvantages from management’s point of view, which can be summarized in the following.

A totally centralized network is described by the star configuration. Activities or services provided by the network are controlled by the central node. From a management perspective, the star configuration may appear attractive because record keeping and major processing are
centralized with one staff instead of duplicated at the multiple processing centres. From a user's perspective, the star configuration may appear very inefficient because the time delay experienced by the user always involves the centre node processing time as well as the time required by each additional library from the outer nodes.

In contrast to the star configuration, the distributed network is a completely decentralized network. Each node has the alternative of communicating with every other node in the network.

The third configuration is the ring network. Like the distributed network there is no control processing node. These two configurations indicate that management decision making may be highly dependent on the consensus of all participants. Unlike the star configuration, there is no central authority and all members share equally in the decision making process. With distributed authority, it becomes difficult to measure or evaluate the overall network activity. Each participant is likely to view the network only from a local perspective.

The hierarchical network enables one to cluster activities based on some criterion such as organizational priorities or processing activity. It is another example of centralized management decision making, but unlike the star
configuration, there are multiple levels of management. Management at the top level delegates some of its authority to the next lowest level. Higher levels of management usually do not interact directly with the lower levels of the hierarchy. This configuration appears to work well where the network environment is large in size or covers a geographically dispersed area. A star configuration may facilitate centralized management control, but perhaps place too much burden and power within a single organization or authority. The hierarchical configuration maintains the advantages of centralized control, but includes an element of flexibility by distributing some of the authority to delegated levels.

The conclusion of the both authors is same "most library and information networks structure usually consists of a combination of configurations which can be called a composite network structure"

3.5 NETWORK FUNCTIONS

Several authors have attempted to classify cooperative programmes in various ways. For instance, Grazier suggests the following three categories.

a) Union lists and catalogues
b) Efforts to coordinate collection development
c) Cooperative use arrangement.
A comprehensive list of cooperative functions are listed by Williams and Flynn. According to them, the cooperative functions range from the very common interlibrary loan to the less common function of serving as a clearing house for materials. In the initial list of functions performed, the following were the most frequently mentioned:

1. Interlibrary loan
2. Reference
3. Delivery
4. Acquisitions
5. Union lists
6. Continuing education
7. Bibliographic access
8. Photocopying
9. Circulation
10. Communications
11. Publications
12. Cataloguing
13. Processing
14. Storage
15. Literature searching
16. Collection development
17. Abstracting/indexing
18. Referral
19. Consulting
20. Accounting and management

21. Microfilming

As the list is long and multi-faceted, they have divided these functions into 17 general headings.

**Management Function** This function is limited to those activities necessary to control and evaluate the network operations, including financial accounting.

**Administrative Function** This includes those activities necessary to support all other network functions, such as coordination, resource allocation, planning, policy making, and funding. These activities shape the network's structure and insure its continued operation.

**Acquisition Function** The procurement of packages of information in whatever media necessary to meet the needs and limitations of the network's objectives.

**Cataloguing and catalogue production Function** The cataloguing function has two parts: descriptive cataloguing and subject cataloguing. Descriptive cataloguing attempts to provide identification data for a package of information in terms of form of entry while subject cataloguing attempts to provide locational and subject access data for an information package. Catalogue production may be in card, book, electronic or micro-image form. It may be in individual or union catalogue.
Processing/Preparation Function  The production of spine labels and book cards, stamping and inserting other items in packages of information, as well as shelving and filing would be included in this function.

Information Retrieval Function  This function attempts to locate packages of information or answer factual questions by utilizing available access points to a data base such as author, title, subject headings, classification numbers, etc.

Circulation Function  This is an inventory control activity that maintains a record of who has what packages of information. Many statistics generated by this function are useful in making decisions concerning other functions, such as acquisitions.

Serials Control Function  This is an order entry/inventory control activity that attempts to perform such tasks as serials check-in, subscription renewal, claiming and tracking the status and location of serials.

Inter library Loan Function  The primary tasks incorporated in this function are acting as an agent for patrons who desire to borrow a package of information outside their own library and lending packages of information to other institutions or individuals as well as maintaining a record of each such transaction.
Delivery Function  This function involves the transmission or transportation of a package of information from one location to another with maximum efficiency and effectiveness.

Storage Function  This is the storage of packages of information at a remote location for on-demand delivery. The information selected for such storage might meet some predetermined criteria and is usually stored remotely to make room for current or frequently used information.

Referral Function  Requests for information that cannot be satisfied by the receiving institution/library are referred to another institution/library. This may involve referring either the requestor or the request itself to another library.

Communications Function  This involves establishing and maintaining channels of communications among members of the network. This may take many forms such as TWX, privately operated interlibrary delivery service, area telephone service, telecommunications network or postal delivery service.

Education Function  Training library staff and users on how to use network capabilities and equipment as well as providing opportunities for continuing education on broader topics would be included under this function. Preparation of training materials such as user manuals, workshop syllabi,
newsletters, computer-aided learning packages, etc. would also be involved.

**Standardization Function**  This includes establishing minimum standards for each network function so as to create a minimum level of compatibility within a specific network as well as among networks.

**Marketing Function**  Network functions and the tasks they accomplish must be known to both members as well as potential members. In addition, evaluation of present services and of the demand for new services must be an on-going process. These, as well as fair and cost recovery pricing, are the responsibility of marketing. The publication of brochures and other useful documents is also within the marketing area.

**Systems development and Support**  The implementation of the various activities of the network require the development of many systems. Once these systems become operational, they require both day-to-day maintenance and periodic development. This includes such activities as documentation, programming, testing, equipment operation and maintenance, supervision, consultation, trouble shooting, production, error correction, and the various activities of system analysis, design and implementation.
3.6 COOPERATIVE TRENDS IN DEVELOPED COUNTRIES

United States of America

In the United States, libraries have been discussing and practicing library cooperation for nearly a century. The library cooperation in USA varies from inter library lending to centralized cataloguing. Library networks using interactive computer system is the newest form of cooperation. Many libraries now participate in networks at local, state, regional and national level.

The notable development for library cooperation in USA is the Farmington Plan. The outbreak of World War II had prevented the accessibility of European publications to the American Scholars. When national and defense agencies wanted many pre-war publications, they could not be located in American libraries. To solve this problem the executive committee of the librarian's council of the Library of Congress met in Farmington in Oct. 1942. The Farmington plan finally evolved out of this meeting in 1947.

The objective of the Farmington Plan was to make sure that at least one copy of each newly published foreign book or any other document that might reasonably be expected to the interest of a research worker in USA will be acquired by an American library, promptly listed in the Union Catalogue at the Library of Congress and made available through inter library loan.
David Weber traces the century long footsteps leading towards library networks among university and college libraries. He chronologically reviews selected examples of cooperative programmes, for instance: cooperative cataloguing, a union catalogue of holdings. Joint acquisition programmes initiated by college and universities from 1876 to 1930, and presents a highly selective list of cooperative programmes from 1942 to 1973. In the latter part of his article, Weber includes details on some special programmes of current significance, and comments on their merits and weaknesses. Joe Kraus reviews some of the cooperative library activities over a period of the seventy five years (1900-1974) under the following aspects: Interlibrary lending, bibliographic access, specialization agreements, cooperative processing, and organization for cooperation.

Kaplan discusses many cooperative projects from the historical viewpoint. He also reviews and evaluates a selection of studies relating to the following topics: acquisition; physical access; bibliographic access and regional bibliographic centres; delivery of catalogue copy; academic library consortia; centralized processing; and reference services.
Evidence of the upsurge in cooperative activity is found in the number of library networks established in the period after 1960. Among the networks initiated by academic libraries, and which are still very vital and active, are for instance the New England Library and Information Network Inc (NELINET), Online Computer Library Centre Inc., (OCLC), Research Libraries Group., Inc (RLG).

NELINET : NEW ENGLAND LIBRARY INFORMATION NETWORK

This programme exemplifies several regional networks. It was originally designed to provide technical processing by-products for six state university libraries in the North-East. Since its inception, its membership and services have both increased.

NELINET acts as OCLC broker for its member libraries, and also develops its own computer based and non computer based services. Top ranking among computer based services are; subject searching, full authority control; cataloguing database; circulation system, file data base; New England union list of serials; and tape services. Among the non computer-based services are: AACR2 assistance; group discussions; seminar and workshops.

OCLC OHIO COLLEGE LIBRARY CENTRE

Operating a bibliographic centre for a family of libraries since 1967, it has been making catalogue cards and
performing other, related services for those libraries by processing MARC tapes and cataloguing entries contributed by 29 members. At the end of 1975 the OCLC on-line catalogue contains nearly 2 million cataloguing records, to which were attached more than 8 million location listings.

RLG  RESEARCH LIBRARIES GROUP INC

It is a consortium comprising the libraries of Columbia, Harvard and Yale Universities, and the Research libraries of the New York Public library. It was established in 1974 and its primary goals are: to share collection resources; to avoid unnecessary duplication of acquisitions and to establish a single computerized bibliographic processing system.

All the above mentioned networks are computerized networks. However, there are still some academic library networks, among them the following are worth mentioning.

1) South-eastern Library Network (SOLINSET)
2) Bibliographic data base services (ILLINET)
3) Washington Library Network (WLN)

UNITED KINGDOM

The most important event in library cooperation in England is the formation of the British Library by the amalgamation of the National Central Library and the National
Lending Library for Science & Technology. As a result, the British Library Board was created, thereby providing a sound base for providing inter-library loan service. It has reported that BLLD caters service of photocopying not only to the England but also to the overseas.

The interesting development in academic library cooperation are the BLCMP library services Ltd, and the South West Academic Libraries Cooperative Automation Project (SWALCAP).

**BLCMP: BIRMINGHAM LIBRARIES COOPERATIVE MECHANIZATION PROJECT**

It was formed in 1969 by the Universities of Aston and Birmingham and the Birmingham Public Libraries. Its aim has been to design and develop a system to utilize centrally-produced machine-readable bibliographic records in the MARC format in local libraries, and to assess the practicability of a regional data bank, accessible to a number of libraries, using these records as well as locally produced records.

**SWALCAP: SOUTH WEST ACADEMIC LIBRARIES COOPERATIVE AUTOMATION PROJECT**

It was initiated in 1969 by the libraries of Bristol University, Exeter University and University of Cardiff. This project aimed at the establishment of a central library computer system of three cooperating libraries linked on-line to a central unit. It was designed for three cooperative
programmes; circulation, cataloguing and acquisitions.

CANADA

In Canada, academic libraries were the pioneers in the development of library networks. Cooperative endeavours among college and university libraries have strengthened since the late 1960's. Most cooperatives were initiated within the provinces, not at the national level. The outstanding networks among academic libraries are Tri-University Libraries (TRIUL), The Ontario Universities' Library Cooperative System (OULCS) and the University of Toronto Library Automation Systems (UTLAS).

TRIUL was established in 1970 as a consortium of three universities in British Columbia Viz., Simon Fraser University, the University of British Columbia and the University of Victoria. It focusses on collection development, processing and public services. OULCS was initiated as an informal arrangement in 1963, and was officially established by the Council of Ontario Universities in 1973. The overall progress of OULCS encompasses: Shared automated library systems; the development of Union files to be used to rationalize collection development and maximize the sharing of research resources; develop and implement a provincial collection development policy for fifteen universities. They conducted a survey to determine the
feasibility of establishing a depository library or libraries in the province. UTLAS was originally developed as a computerized bibliographic system of the University of Toronto library in 1967. In 1971 it extended services to other libraries in Ontario. It serves a bibliographic utility of libraries at the national level like OCLC.

AUSTRALIA

Australia is the prominent country in Oceania which has promoted and maintained resource sharing networks. The Australian Government approved of special provision within the National Library's budget of resources to initiate a modest Australian programme of resource sharing in Asia and Oceania.

Chandler reviewed the development of the resource sharing network in Australia when it began with the decision that the National Library Council should develop library based information services, then establish a national collection of library materials, encourage national cooperation, and develop nationwide bibliographic information services. He noted that Australia had few information networks, each working separately, but the National Library Council was urged to develop a library based information system. The National Library of Australia (NLA) considered that the major problem in utilizing the vast amount of
scientific and technical information available to the public was the lack of awareness that these resources existed.

Resource sharing in Australia is voluntary, but effective. The National Library of Australia has promoted and maintained a wide range of resource sharing networks covering science and technology, industry, the social sciences, etc., offering traditional computer based and referral services. Thus, it regularly access many data bases in the same fields and generates its own Australian data bases which it makes available on-line through the Australian Information Network (AUSINET). NLA also participates in the international exchange of MARC data; is the national agency of CIP, ISBNs and ISSN; and is the designated focal point for the Australian Library based Information System (ALBIS), and also for UNISIST, NATIS and GIP of UNESCO. The following networks are developed by NLA are 1. The on-line Medical Network 2. The Industry Network 3. AUSINET 4. The National On-line Shared Cataloguing Network.

FEDERAL REPUBLIC OF GERMANY

In the Federal Republic of Germany, each of the eleven federal states is responsible for its academic libraries within the individual states. However, a number of joint projects including acquisition policies, central cataloguing and organization of the inter library loan system have been
undertaken among academic libraries of the country.

3.7 COOPERATIVE TRENDS IN DEVELOPING COUNTRIES

From the examination of the literature on librarianship, one can infer that relatively few books and articles published on the topic of library cooperation in developing countries.

Malhotra explains the reason for lack of library cooperation among developing countries is that these countries once freed from colonial rule, focussed their priorities on industrialization to the detriment of information services such as publishing trade, libraries and others.

United Nations Development Programme (UNDP) provided funds for international meetings organized by UNESCO to bring together representatives from many developing countries to consider scientific and technical questions in connection with the UNISIST programme. Two such conferences were organized. IFLA-UNESCO Pre Session Seminar for librarians from developing countries, Antwerp University, 1977, and the International Conference of Directors of National Libraries on Resource Sharing in Asia and Oceanic, Canberra, 1979. However, most librarians and national library directors who have participated in both the Canberra and Antwerp conferences found that cooperation was easier to talk about than to practice.
Generally speaking, developing countries lack any kinds of information systems because of the absence, among many other reasons, of strong and effective national libraries. A brief account of cooperative activities in the developing countries are discussed.

**ARAB COUNTRIES**

Sharif observes that three important factors affect librarianship in the Arab Nations. Lack of cooperation among libraries, absence of library standards and difficulties of purchasing foreign materials.

A recommendation by the UNESCO Regional Seminar on Library Development in Arab-Speaking states for the establishment of a regional scheme for the cooperative acquisition of foreign publications, and a Union Catalogue of such publications, has not as yet materialized. In fact, Arab libraries admit that libraries in the Arab World have more extensive ties with libraries in the west than with themselves.

**INDONASIA**

Prakoso narrates the efforts to initiate resource sharing programmes in Indonesia. Four prominent national centres of Indonasia have been assigned to provide national
services in their respective fields of specialization:

a) Bibliotheca Bogoriensis, Department of Agriculture, for biology and agriculture

b) National Scientific Documentation Centre, Institute of Sciences, for science and technology

c) Central Health Library, Department of Health, for health and medicine.

d) The fourth centre would be for Humanities and Social Sciences.

In addition to this, a national programme for an integrated library and information service is also proposed with clear aims and objectives.

BANGLADESH

The responsibility for promoting and coordinating scientific and technical research in Bangladesh rests with the Bangladesh Council for Scientific and Industrial Research (BCSIR), which is responsible also for collecting and disseminating scientific and technical information, and establishing scientific libraries. BCSIR maintains a library of its own which provides a basis for the documentation services of the Bangladesh National Scientific and Technical Documentation Centre (BANDOC), which is a part of BCSIR.
PAKISTAN

The pioneer "Library Resources in Pakistan", which was published by the Institute of Public and Business Administration, is of considerable assistance in promoting resource sharing in Pakistan. However, the Pakistan National Scientific and Technical Documentation Centre (PANSDOC) is considered the most important of the centres with which the National Library of Pakistan was to collaborate in the development of its role in national and international information systems.

INDIAN SCENE

In spite of having rich collection of documents and professional manpower in Indian libraries, the library cooperation in India is still a new born child. "The library cooperation in India has been much written and talked about in conferences, seminars, discussion groups and at personal level".

In India, although, theoretically, the idea of library cooperation is quite familiar to the library professionals, in practical terms not much has been done so far in this direction.

In India, due to diversity of language problems, scattering of libraries over vast territory, and varied
requirements of different kinds of libraries, it may not be feasible to adopt a scheme particularly on all India basis on all aspects of library cooperation. To begin with, systematic schemes on a few selected aspects of library cooperation can be initiated for implementation, separately in university libraries, Special libraries, Public libraries etc.

Literature on library cooperation is varied in both content and quality. Articles in various Indian Journals showed its importance, essentiality, and the need than actual facts. A search in the literature also showed that library cooperative activity is a mere lip service than togetherness.

The literature on library cooperation in India shows, the importance and need for cooperation among libraries. One of the oldest article published by Sharma emphasises the necessity of cooperation for better and smooth research. The article by Viswanathan stresses the need for cooperation in India, He says library cooperation is not just inter lending of reading material, but it is much more than that. He emphasises the need to include cooperative acquisition, rationalisation of the existing stock by means of exchange, preservation of our national resources on a cooperative basis.

The literature published in 60's has strengthened the concept of cooperation and made some attempts to do some actual work. The papers submitted at the seminar on library
cooperation held at Calcutta, underline the need for bringing out the union list of periodicals in Indian libraries. The articles by A K Mukherjee, B Sengupta, K Bhattacharyya and others recommend for Union catalogue of periodicals, they also discussed the possibility of cooperation in the areas of Abstracting and Translation. J Saha's paper concerns with the managerial principles and different aspects of cooperation in the utilization of the available means of reproduction existing in the libraries and documentation centres in India. The 3rd IASLIC Conference recommends the cooperation among the libraries in the matter of inter library loan and also to examine the problems involved in inter library loan and suggest a draft model code. A K Mukherjee's paper gives the importance of inter library loans, types of material to be loaned, conditions and period of loan, methods of getting materials on loan and measures to be taken. K B Gauri discusses the need for inter university cooperation. He also gives a plan of cooperative specialization in the University libraries in Punjab. Narayana in his paper describes the origin of the idea of union catalogue, their functions, structure, compilation and maintenance. K S Hingwe as a convener of the committee has prepared draft general code for inter library loan. This paper also includes definition, scope, materials to be lent/not to be lent, terms and
specimen forms for Inter library loan requisition.  P K Patil emphasises the need for cooperation and its aspect, and also discusses the aids to inter library cooperation, describes the levels of cooperation. The papers by Amitabha Chatterjee, S M Sehgal, R T Deshmukh, R P Indwar S B P Kapoor N H Barodia discuss the dire necessity for cooperation in Indian libraries. These papers also deal about different spheres of cooperation like cooperative acquisition, cooperative cataloguing and classification and inter library loan etc. Seminar of university librarians held at Rajasthan University, Jaipur in 1966 recommends that a) A union list of serials in humanities and social sciences be compiled by a suitable institution b) The draft code for inter library loan as formulated by the IASLIC be implemented and provide reprographical facilities c) postal rates for books sent on inter library loan be reduced. D K Barua in his paper emphasises the need for the library cooperation and narrates the present situation of cooperation among Indian libraries. Sultan Ahmed's article while discussing the acutely felt need for cooperative movement among the research libraries, suggests various ways and means for evolving a well coordinated information service on the local, regional, national, and international level.

The literature of 70's shows a considerable development of library cooperation. TKS Iyengar's paper: A mathematical
design for experimental evaluation of inter library loan operations is based on local situation at IISc Bangalore, in a general way applicable for the special and academic libraries in different regions in India. Ved Bhushan emphasised special consideration for library cooperation in India. This paper surveys Indian reference tools to be consulted for specific information in the field of library cooperation in technical libraries, also points out the need for improving the quality and standard of existing reference tools and also makes a number of suggestions.

S K Rout outlines various proposals for cooperative library schemes and inter lending in India. He also suggests a new scheme with the basic aim of satisfying reader demands. The scheme centres on the state central libraries which would be entirely responsible for cooperation within each state, have state-wide legal deposit rights and would specialize in the acquisition of certain subjects. K S Nagarajan gives the objectives of inter library cooperation and emphasises the importance of the union catalogue in achieving the objectives. He explains the need for regular updating of union catalogue by exchange of data among the libraries and the INSDOC regional centre to act as clearing house for the exchange of cards. Urges the need for inclusion of types of documents other than periodicals in Union catalogue. Suggests a cost benefit study for the union catalogue. T D Wakenis
identifies reasons for lack of statutory or recognized voluntary schemes of library cooperation in India. Looks at some recent developments which may help to raise the present low level of library cooperation. Navjot Kaur emphasises the need for library cooperation in documentation activities.

The Whole issue of ILA Bulletin 14,(1-4) Jan-Dec 1978 69-75 PP.1-93 is concerned with resource sharing and inter library cooperation amongst all types of libraries in India. Articles cover public libraries, libraries of particular regions, education libraries, scientific and manuscript collection and national efforts to promote cooperation. R L Mittal emphasises the need for cooperation, he describes 6 areas of possible cooperation 1) Cooperative acquisition 2) Book exchanges, 3) Cooperative storage 4) Inter library loan 5) Cooperative cataloguing and 6) cooperative binding

Library and Librarian Vol2 no.1 June 78 also discussess about resource sharing network, its concept and its need and importance among research libraries, and constraints in cooperative acquisition. Jeyarani Durairaj describes the present state of library cooperation in India and the Government's plan for the establishment and development of the National Information System for Science and Technology (NISSAT). Discusses the various types of library cooperation
which will be needed to meet the requirements of all these users.

In 80s a considerable progress has been made in terms of 83 library cooperation in India. R K Dasgupta at International Conference of Directors of National Libraries on resource sharing in Asia and Oceania held at Canberra, Australia suggests the National Library concern itself with material relating to study and research in arts and social sciences, and the INSDOC, New Delhi with that of science and technology. Medicine and Law being concern of the Central Medical and Law Library in New Delhi. This system can operate smoothly, only when one of these National libraries takes upon itself the role of clearing house of information and documentation.

A laudable and ambitious project has been initiated at New Delhi by Indian Council Of Social Science Research jointly with Jawahar Lal Nehru University in sponsoring Inter 84 Library Resource Centre for promoting social science research. To start with, important libraries in the city have already deposited back files of social science periodicals and less used materials to the centre. The deposits are accepted on condition that the proprietary rights of their less used research materials will be maintained. The centre remains responsible for organizing this material and for providing service to readers.
Another important achievement is that the libraries of BARC, Bombay University, IIT Bombay and TIFR reached an agreement on library cooperation. The major achievements were:

a) Effective courier service
b) Simplified inter library loan

c) Union catalogue of current journals
d) Staff training and
c) Controlling duplication. They also started cooperative acquisition, processing storage etc.,

Major breakthrough in library cooperation in India is the publication of union catalogues. INSDOC and ICSSR have published union catalogues of periodicals and other serials covering all important libraries of the country. Central library IIT Madras has published a union catalogue of serial holdings available in IIT libraries and IISc library.

In January 1988 INSDOC has released a 4 volumed publication of National Union catalogue of scientific serials in India (NUCSSI). With this publication, the commitment of INSDOC to provide bibliographical control of scientific serials resources within the country is partially fulfilled. NUCSSI contains the holdings data of more than 800 institutes within the country.

NUCSSI contains holdings data relating to about 35,000 titles of serials including about 4,000 cross reference entries, and this data base is available in a machine readable format. It is hoped that in near future NUCSSI
The article by Saibaba proposes a cooperative networking among engineering and technological libraries. The network he proposes would be both centralized and decentralized. Each IIT Would function as the centralized library. All the engineering colleges in that region/zone would be the members of IIT, and each IIT would function as a nodal point.

Until some time ago lack of efficient communication facilities were the major obstacles for the effective cooperative networking among the libraries. However, recent developments in communication technology and the application of computers to the Indian library administration have both contributed towards making it easier to extend cooperative action among the libraries.

Advances in computer and telecommunication technologies have opened up new vistas for speedy transmission of information across time and space. New methods of information storage and retrieval, creation of bibliographic and non-bibliographic data bases in almost every subject and the link up of all these through a variety of communication networks, are being given a trial for subsequent implementation on modern techniques.
The convergence of computers and communications has started playing a pivotal and very significant role in re-defining the telecommunication industry to take up the challenge of realising emerging telematic services. The existing networks, which were engineered primarily for realising telephone communication, are being threatened to take new shapes to become information oriented networks with the potential to handle and transport a variety of information in diverse ways. Each new generation of technology, particularly during the last decade or so, has been resulting in offering greater speed, capacity and versatility in transporting and processing information and with reduced unit costs.

In view of the rapidly changing face of the Indian telecommunication industry in respect of the existing telephone, telegraph and telex services as well as the introduction of digital technology in switching and transmission systems, the following networks in India are emerging up.

**NICNET**

The National Informatics Centre (NIC) was set by the Government of India for developing appropriate information systems to facilitate the planning and decision-making process in the Ministries, Departments of the Central and State Governments in the country. For this NIC has installed
one very large dual processor computer (NECS-1000 Model 20D) at New Delhi and three very large computers (NECS-1000 Model 10) one each at Bhubaneswar, Pune and Hyderabad. To facilitate local processing and also store the state information systems at each of the state capitals and union territories, NIC has installed super computers. For capturing the data at the generating points, 386-based computers have been installed in most of the district headquarters. All these computers have to be interconnected to achieve the above mentioned objectives. For this, a network called NICNET (National Informatics Centre Network) has been established by NIC based on satellite technology. This network will enable information flow and distributed information storage and help Central and State Government Departments to draw plans for efficient utilization of resources and ensure uniform socio economic development activities throughout the country. This is the first integrated computer communications network with efficient software and highly trained manpower, established in a developing country.

INDONET

INDONET is an integrated information management and distributed data processing facility spanning the entire country. Under this project computer network is being setup with computers at Bombay, Calcutta, Delhi, Hyderabad and
Madras. INDONET will provide local computing facilities, highly specialized software in areas of engineering design, management sciences which professional organizations may share.

The primary objective of the INDONET project is to provide a network of computer facilities accessible to remote areas in the country so as to deliver the benefits of information processing to a wide sections of the users in the country.

INDONET is the first commercial computer network being evolved by the CMC limited, Hyderabad. In its first phase, the network consists of three IBM 4361 computers at Calcutta, Bombay and Madras, PDP 11/44 at Delhi and ROB 1055 at Hyderabad with access points in the cities of Bangalore, Ahmedabad and Pune. The network has adopted IBM's systems Network Architecture and uses dedicated lines of 2400/4800 bps. For intra-city communication, data transmission speed of 1200 bps is possible.

In its second phase, the number of INDONET centres is expected to grow to 100 by the year 1990. It would operate as a STAR Network with control point at Delhi, using rooftop 3 m. earth stations and packet switching technology for routing of data from central station to other INDONET centres. At this stage, the transmission speed would be 64 k bps. Besides the IBM protocol, the network will also utilize X.25. For intra-city transmission, a novel cost-effective,
reliable and faster (9600 bps) digital packet radio scheme has been innovated. The Bombay node of INDONET has been connected to the international gateway of Videsh Sanchar Nigam Limited, thereby facilitating entry to Public Data Networks of other countries.

INFLIBNET

INFLIBNET is a major national effort to improve capability in information transfer and access, as support to scholarship, learning, research and academic pursuits. It would link up institutions of higher learning covering all disciplines. R & D institutions and national organizations like CSIR, ICAR, DRDO, ICMR, ICSSR, etc.,

It would be a multiple function/service in the sense that it will also offer catalogue-based services, database services, document supply services, collection development and communication-based services.

There will be a national centre for managing, overseeing and coordinating the network administration and four regional centres which will maintain regional union catalogues apart from databases on projects, institutions and specialists.

At the sectoral level, UGC's information centres and NISSAT Sectoral Centres or those performing national level functions/services in specific subjects/disciplines/missions
would be included. End-users will be served locally through college/departmental/university or R&D institutional information centres. In all, there will be 150 university libraries, 50 post-graduate centres/autonomous colleges, and 200 libraries of R & D institutions/centres of national importance outside the university system.

INFLIBNET proposes a hybrid version of satellite and terrestrial network communication system with a star configuration for interconnectivity of the nodes. Inbound carrier to the central hub would be through satellite. While outbound carrier from the central hub to the nodes would use satellite and time division multiple access Interconnecting nodes in a city, if they are many, is through a LAN. The networking protocol for INFLIBNET would be similar to the HDLC protocols.

The INFLIBNET project is proposed to be taken up during eighth five year plan (1990-95)

CALIBNET

CALIBNET is envisaged as a metropolitan network linking some 38 libraries in Calcutta metropolitan area. The applications to be supported are; electronic mail, file transfer, remote log-on and database and document access.
Within individual libraries, the functions to be automated are cataloguing, serials control, acquisition and fund accounting, circulation and local user services of current awareness, SDI, union catalogues, partial databases, and access to national and international networks.

Each participant would collect, process and hold information on local computers, connected with one another through X.25 packet-switched network. One of the network participants would host global user service and also act as the network control centre. Standardization may be based on UNIX operating system.

The implementation is divided into two phases. In the first phase all institutions within the Jadavpur University Cluster and some nodes of Razabazar Cluster such as the Department of Radio Physics, Bose Institute and Saha Institute of Nuclear Physics have been included. In the second phase, the other libraries, such as the Ballygunge Science College, Medical libraries, National Library and ISI would be brought in. March 1990 has been set as the target date for the full operation of first phase.
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