5.0 Introduction

In the present day world, information is regarded as a major resource for any development activity. With the liberalization of economy and consequent globalization, the demand for information is increasing rapidly. Information is now recognized as a key component of strategic planning and decision-making. The advent of digital computers and modern telecommunication technologies have made possible the needed information available instantaneously. Most countries are now modernizing/setting up libraries and information centres with access to on-line as well as CD-ROM databases. With access to better communication facilities, information is becoming available on desktop in a big way. Internet and World-Wide Web (WWW) access are growing at a rapid pace. This will be the most preferred and probably the only mode of accessing databases, electronic journals and other multimedia databases.

The networking and resource sharing in libraries are the powerful tools for both increasing productivity and enhancing to meet the changing needs of library users. The computerization of library resources has introduced a new concept: resource-sharing among the libraries in India. Besides improving services and operations for a better performance, libraries
are also able to evolve effective computer networks towards optimum utilization of resources and facilities. Such efforts are there in many countries, including India.

5.1 Technology and Library Network

The network aims at evolving a mechanism of partnership in which each member has something useful to contribute to the others in the network. Basically, a co-operative venture of two or more libraries with a view to optimize the utilization of available resources.

The “computers are the brains of a new world information age; networks are the arteries and veins of the pumping information from place to place” Chen (1994)\(^1\) The information superhighway promises to be the network that binds together all other networks from the local to the global. Computer networks enable remotely placed computer systems to communicate with one another. The distance between these computers can vary from a few feet to thousands of kilometers. Today, “computer networks are being used to provide resources sharing between systems separated by countries. Users connected to these networks are able to share databases,
software's and other computing resources. They are able to communicate with one another by sending electronic mail or initiating video conferencing session. Computer networks have been responsible for the development of many new applications, which require access to distributed resources.” (Murthy 1996)²

Generally a library network is developed when a group of Libraries and Information Centers decide to share information resources through computer application. It is a set of inter-related information systems associated with communication facilities, which are cooperating through more or less formal agreement in order to jointly implement information handling operations with a view to pooling their resources, and to offer services to the users. A library Network is a linking member to the computer resources by means of telecommunication connections.

5.2 Objectives of the Library Network

The information storage and retrieval problem has become progressively more serious in recent years, especially in the areas of science and technology, where the volume of data and information is increasing at
an unprecedented, nearly exponential rate. Libraries have been acquiring the printed and e-resources to fulfill their users' demand. But the ratio of information explosion and the cost of the resources in the market has been constantly appreciating from time to time. Hence, libraries cannot make such developments and have failed to satisfy of their users' requirement. Therefore library networks are solving such problems with the following objectives, viz., to provide access to a wider base of information resources; to facilitate linkages with various national and international networks; to rationalize acquisition and optimize utilization of information resources; to promote standards and efficiency in the library operations; to generate new services; to develop forums for interaction amongst information professionals; to seek solutions to common problems.

5.3 Growth of Library Networks in India

The networking efforts in various countries got a boost with the tremendous and fast developments in computer and communication technologies, which led to the implementation and successful operation of national and international communication networks. These networks were commonly used for business and commercial applications, but the libraries
were quick to start making use of these networks for linking libraries for resource sharing among themselves. The success stories of library networks in the advanced countries are Online Computer Library Center (OCLC), (Originally called the Ohio College Library Center - Ohio in 1967), The Washington Library Network (WLN), the Research Library Information Network (RLIN), in the USA, and the Joint Academy Network (JANET) and British Library Automated Information Service (BLAISE) in UK, Research Libraries Group (RLG), Columbia, Chinese Academic Library and Information System (CALIS), Australian Academic and Research Library Network (AARNET) etc.

Recognizing the vital importance of and the drive need for the optimum utilization of available resources, the Library and Information Networks (LINs) have been developed in different parts of India since 1988. They are as follows:

5.3.1 Information and Library Network (INFLIBNET)

INFLIBNET is a major University Grants Commission (UGC) programme initiated in 1991 and located at Gujarat University campus at
Ahmedabad. It sets out to be a major player in promoting scholarly communication among academicians and researchers in India. The major objectives of INFLIBNET include: “to evolve a national network; to interconnect various LICs in universities, deemed-universities, colleges, UGC information centers, institutions of national importance and research institutions for efficient sharing of information; to provide reliable access to document collections in libraries by creating online union catalogues; to provide better access to worldwide bibliographic information sources with citations and abstracts through indigenously created databases and by establishing gateways for online accessing of international databases; to provide document delivery service by establishing resource centers; to implement computerization of operations and services in LICs by following a uniform standard; to train and develop human resources in the field of computerized library operations and networking to be implemented and sustained nationwide; and to evolve standards and uniform guidelines in techniques, methods, procedures, hardware and software services in order to optimize pooling, sharing and exchange of resources and facilities; the technical training for library automation to the professionals; to development and up-gradation of software” (Pramodkumar and Arora 1996)³
5.3.2 Developing Library Network (DELNET)

DELNET which, has been in operation since 1988, and was registered as a society in 1992. It was initially sponsored by the National Information System for Science and Technology (NISSAT), the Department of Scientific and Industrial Research, Government of India, and is currently being promoted by the NIC and the India International Centre, New Delhi. DELNET has been established with the primary objective of promoting resource sharing among the 103 member libraries through the development of a network. It has been actively engaged in the creation of various databases using DELSIS. The services provided by DELNET include: “Internet; email; Union Catalogue of Books in CCF & MARC format; a Union List of Current Periodicals; a Database of Periodical Articles; Indian Specialists: A Who's Who; CD-ROM databases; a Union List of Video Recordings, Sound Recordings and Newspapers; a Database of Theses and Dissertations; organizing IT training for library professionals and the publication electronic newsletter.” (Kaul 1996)
5.3.3 Biotechnology Information System (BTIS)

The BTIS was established by the Department of Biotechnology (DBT), Government of India, during the Seventh Five Year Plan (1985-90), to serve as a distributed database and network organization. It consists of nine specialized distributed information centers (in genetic engineering, "animal cell culture and virology, plant tissue culture, photosynthesis and plant molecular biology, reproductive cell physiology, cell transformation, nucleic acid and protein sequences, immunology and bio-process engineering) and 23 user centers established at various national R&D institutions and Universities situated around India. BTIS, piggybacked on NICNET, provides integrated information resources on various interdisciplinary aspects of Biotechnology, including: Molecular Biology databases; Soft information - bibliographic literature in Biotechnology including online access to international sources and CD-ROM based databases; Management information - R&D projects sponsored by DBT, Patents in Biotechnology, Profiles of Research Activities in Biotechnology, and various other directories and Computation facilities for bio-computing and molecular modelling applications at five national institutes". (www.nic.in)\(^5\)
5.3.4 Scientific and Industrial Research Network (SIRNET)

In 1990, the Council of Scientific and Industrial Research (CSIR), New Delhi, set up a computer communication network, SIRNET, for the exchange of information among its 40 laboratories. The main objective of SIRNET is to “help organizing indigenous online database services on food technology, natural products, chemistry, radio physics, and medicinal plants. It provides access to these databases: the National Union Catalogue of Scientific Serials in India (NUCSSI), the Current Contents of Indian Journals, Polymer Science, the Material Science bibliographic database, the Catalogue of Scientific & Technical Conference Proceedings.” Prakash (2002)\(^6\)

5.3.5 Technology Information System (TIFACLINE)

TIFACLINE is designed as a national network for online technology information. Initiated in 1990 by the Technology Information, Forecasting and Assessment Council, the Department of Science and Technology, New Delhi, it came into operation in 1991. “TIFACLINE aimed at integrating technology information available in various national institutions and
organizations. It provides information on different technology fields that a user might want to access in the form of databases created at various national centers of expertise” Raman (1991)\textsuperscript{7}

5.3.6 Calcutta Library Network (CALIBNET)

In 1993 the CALIBNET was envisaged as a metropolitan network, linking 38 libraries in Calcutta with financial support from NISSAT. Its prime objective is to “institute systematic inter-library cooperation and document delivery among the networked libraries for effective resource sharing. It has been offering services such as, technical support for the library automation, current awareness, union catalogues, access to database, e-mail, file transfer, remote log-in to databases and document access.”

5.3.7 Madras Library Network (MALIBNET)

Academicians and scientists initiated the MALIBNET in 1991 to form a network of libraries in Madras city. It began operating as a registered society in 1993, using IT to share resources among LICs. The network is

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composed of around 50 libraries. The main objectives of MALIBNET are: “to foster the growth of knowledge and to undertake scientific research in the fields of library, documentation, information sciences and technologies; to evolve a network of LICs initially in and around Chennai, and later in other parts of the state; to establish appropriate connectivity with other regional, national and international libraries, information and documentation centers and networks; and to organize conferences, lecturers, workshops and seminars. The services from MALIBNET include: access to lists of current serials of the member libraries, specialized databases, and the supply of document copies, e-mail, and access to databases and contents information for 500 journals. It was hosted Medicinal, Aromatic Plants, Polymer Science and the Automotive Engineering database.” Raghavan (1996)⁹

5.3.8 Bombay Library Network (BONET)

The BONET, initiated and funded by the NISSAT during 1994, it aims to make information available to the researchers at low cost, using computer-networking facilities and at the same time, enhancing inter-library cooperation among the libraries in and around Mumbai. The services offered by BONET are: an online catalogue of periodicals and books in member
libraries; an inter-library lending service for books and periodicals integrated with e-mail; online information retrieval systems for Computer Science and Software Technology; extensive back issues of international journals held by member libraries and online access to foreign library catalogues and commercial databases.

5.3.9 Mysore Library Network (MYLIBNET)

The MYLIBNET was set up during May 1995 in the city of Mysore with financial support from NISSAT, and is housed at the Central Food Technological Research Institute. About 116 colleges/institutions are affiliated to the University of Mysore, and the 34 college libraries located within Mysore have networked in the first phase. The objectives of the MYLIBNET are: "to share resources of libraries; to provide e-mail, to develop software tools for better library management; to create awareness in the field of IT; to set up information bases in collaboration with industry; to disseminate information about new arrivals of books and journals; and to conduct surveys and events like seminars, workshops, or training programmes. MYLIBNET offers assistance services for the automation of library in-house operations, e-mail, access of various databases, training of
trainers in IT, hosting of member library information on servers for the participating libraries.

5.3.10 Pune Library Network (PUNENET)

PUNENET is a joint programme of the University of Pune, Centre for Development of Advanced Computing and the National Chemical Laboratory. The project is funded by NISSAT. The main objective of PUNENET is to “open doors to the information available in the libraries and other resource centers in Pune. PUNENET maintains centralized books, periodicals, and professional databases of the participating libraries’ holdings. The other objective is to help in increasing cooperation among the participating libraries and to coordinate their activities so as to serve the user community efficiently.” www.punenet.ernet.in

5.3.11 Ahmedabad Library Network (ADINET)

ADINET is a network of libraries in and around Ahmedabad. ADINET was registered as a society in October 1994. It is sponsored by the National Information System for Science and Technology (NISSAT),
Department of Scientific and Industrial Research, Government of India. ADINET aims to bring about a cooperative mode of working amongst the libraries and information centers in and around Ahmedabad. The main objective of ADINET is to “promote sharing of resources and disseminate information among member libraries by networking them and creating a centralized Union catalogue of their holdings. It plans to coordinate efforts for suitable collection development and reduce unnecessary duplication wherever possible. A centralized database of periodicals, books and non-book materials available in the libraries of Ahmedabad is being created by ADINET.” Thakore (1996)¹¹ Records collected from participating libraries are being suitably formatted and merged to generate a union catalogue of Ahmedabad libraries. With the cooperation of participating libraries, this database is being regularly updated.

Among the above networks in India, INFLIBNET and DELNET are working more effectively and have proved their importance in the field of library and information science.
5.4 Impact of Networking on Library and Information Service

The needs and requirements of users have been changed enormously in the present information society and particularly in polytechnics. A single library cannot meet the requirements completely, and to solve this problem of users more and more number of libraries must work together. Hence, comprehensive information services must be based on modern advanced technology such as networking. Since libraries and information centers are open to the users of whole society and what they offer are comprehensive services, a new relationship of interdependence and mutual-complementation should be established among libraries. Moreover, it is also a sharing relation that one can enter another's database and make full use of it. This is possible only through the use of computer and modern communication networks. There are innumerable information resources on the network platform. Libraries can exchange information and share resources on the net. At present, the Internet has covered more than 150 countries and regions, which has linked more than 30,000 networks, 6,000 libraries and specialized organizations. In the future, networked environment mainly include the contents of library services: developing and exchanging of information resources, instructing of information utilization,
connectivity featured information, protection of copyright and technical support etc.

Network based library and information services will help to sharing the resource without increasing the book budget. The cost effective Internet technology has tremendously changed the role of library and information professionals.

5.4.1 Catalogue Databases: The OPAC server is a very simple solution over a TCP/IP network. Under the different platforms of operating systems a user can log on as a guest account, which usually starts the OPAC, access program. The user accesses the OPAC by using within the web browser interface. He should be able to access the OPAC and similar catalogues by using HTML based query forms, obtained by selecting an appropriate link in the library home page. After the user fills the query form and submits it, the Web server initiates a search program that carries out a search on the catalogue database and returns the results in HTML form to the user’s browser screen via the Web server. Most of the present day library automation packages have extended their functionality to support Web access. If this is not the case, the vendor may be approached to provide this
functionality. If the OPAC software is capable of handling queries on Z39.50 format, then one can use public domain Z39.50 to Web interface software so as to provide Web access to the OPAC. Several solutions also exist today to provide Web access to CDS/ISIS databases. Several public domain text indexing and search packages are also available which can be used for bibliographic and full text data.

5.4.2 Current Awareness Bulletins: Current awareness bulletins like list of new additions, documentation lists, etc., can be easily delivered via e-mail to individual staff, and also external users. If the bulletins are lengthy, only the content page may be delivered over e-mail, with an indication of the HTML page that needs to be accessed on the Library Web server, to get to the full document. E-mail based delivery is quicker and also saves money involved in producing print-based documents. A key requirement is the maintenance of an up-to-date e-mail address list. One needs to plan for contingencies like bouncing mails. E-mail is a very powerful delivery channel, and is used by more people than the Web on the Internet. It is ideal for transmitting information to the user. Traditional SDI services can be made more effective and efficient via e-mail. It is possible to conceive of a variety of profile-based alerting services, for delivery via e-mail. These may
include content pages, citation information, bibliographic information, etc., extracted from recent database updates (e.g. CD-ROM databases) based on individual profiles. Though Web is a very attractive medium, a user has to be ‘pro-active’ in its use. He needs to regularly visit the library web site to know new services, modifications to existing services, etc. Furthermore, some staff may not take to the Web mode of information gathering easily compared to e-mail. E-mail is more effective in keeping the user updated about new developments.

5.4.3 Externally Purchased Databases: Several database publishers today offer Web-based, intranet solutions for providing local access to their databases. Examples include Silver Platter, through their new popular ERL (Electronic Reference Library) software, Cambridge Scientific Abstracts and Institute for Scientific Information (ISI), who now offer a very exciting product called ‘Web of Science’, providing intranet access to their Citation Index databases, Journal Gate, J-gate Customizes Current Contents etc. Journal publishers have also begun to offer similar solution, for example, Elsevier, Taylor and Frances, Blackwell and Emerald, for electronic versions of their journals. Libraries can take advantage of these developments and provide desktop access to key databases and electronic
publications to their users. Such solutions, however, require considerable investment on hardware. A key requirement in offering network access to licensed databases is safeguarding access from external users. Varieties of solutions exist to handle this without much difficulty.

5.4.4 CD-ROM Databases: Traditionally, libraries have used network operating systems, like Novel NetWare, in order to provide multi-user access, over a LAN, to CD-ROM databases mounted on a CD Tower. As most CD-ROM applications are DOS or Windows specific, access to these databases are limited to PC clients. Also, the user is required to configure his/her desktop PC by installing a NetWare client code. In such systems, achieving transparent network access from the user’s desktop is often quite difficult, due to problems of file server, CD server or the desk top. Providing adequate support to handle these problems on a large network is not often easy. Some of the current CD servers (e.g. Meridian” CD Intranet) reduce this complexity by incorporating the network operating system (e.g. Windows NT), CD server software and the CD application software, on the hard disk or the CD server. In combination with a Web server, these systems also enable launching of CD applications from Web browsers, by
clicking on hypertext links on a HTML page. A slightly more complex solution is to use Web launcher scripts to achieve the same result.

5.4.5 Remote Information Services: A variety of information sources and services can be accessed over the Web today on payment of subscription / license fee. These include journals (e.g. IEEE, IEE, Elsevier, Academic Press, etc), databases (e.g. CSA, Silver Platter, Dialog, STN etc) and information services (e.g. Journal Tracker from ISI, CODASWEB, etc.). Depending on the type of subscription / license availed, access to these can be limited to specific PCs or provided across the Intranet. From the experience a librarian has in handling print journal and CD-ROM subscription, he is well placed to negotiate agreements for such remote information services. Links to these can be incorporated in the Library Web pages, from which the user can connect to the remote site.

5.4.6 Internally Published Newsletters, Reports: More sophisticated use of the Internet is to mount internal publications, like newsletters, reports and staff publications, on the web server and provide access to these over the intranet and the Internet. The goal here is to convert these publications to Web accessible formats and provide access to these through table of contents.
with or without full text search support. Two full text document formats that are widely used today are HTML and the Adobe’s PDF (Portable Document Format). PDF is a very popular Web publishing format. Web publishing by using PDF is also quite simple without requiring too much of investment. Recently a less complex version of SGML, called XML, has been proposed for tagging full text publications. There is enough experience from digital library research for the librarian to learn from before embarking on provision of these services. Also there are commercial and free softwares available in this area. These require careful planning and involvement of personnel from other departments in the organization. They also require additional investment in digitization equipment like scanners. The staff also needs to be trained to handle publishing and access tools.

5.4.7 Local Mirroring and Cataloguing: The library web server can be used for several other useful purposes. The librarian may consider mirroring highly useful and often-visited Web sites. This may include, for example, table of contents of current issues of journals, like ‘Science’ and ‘Nature’. Intranet users can browse the content pages on the library Web site and then link to the publisher’s Web site for further navigation, if they desire to do so. “Such mirroring will require permission from the publishers. Mirroring
helps in reducing network traffic on the Internet link and, more importantly, make the library server more popular. Mirroring requires an Internet link of suitable speed and also the prior approval from the owner of the page being mirrored. In a networked environment, integrating remote Internet-based information sources into existing services becomes very important."

Nieuwenhuysen (1997) One way of achieving this is by developing a Web accessible Internet resource catalogue, in the form of HTML pages, pointing to key Internet sources of relevance to the goals and objectives of the parent institution. Users can browse these pages on the Library Web site, select sites of their interest and then connect to them via the Internet. These catalogue pages need to be regularly updated with information about new sites. Also, it is very important to validate the currency of links on these pages as Internet sites are notorious for changing their location and even to go underground! Very interesting and useful work is going on in the area of cataloguing of Internet resources and organization of these catalogues. This experience will be useful in designing state-of-art catalogues. A key requirement for large resource catalogues is to index the related HTML pages and provide keyword search facility. Several public domain tools are available for mirroring of Web sites, link validation and indexing of HTML pages.
5.4.8 Bibliographic Information Services: Bibliographic services include the creation of bibliographic records and the compilation of bibliographies, catalogues, indexes or any other form of bibliographic database. Access to the databases created by individual libraries and also the union database access provides the bibliographic details of an item held by the libraries. Bibliographic information service provides patrons with access to a variety of databases. This also includes access to the database subscribed by the individual libraries in CD-ROM as well as the databases subscribed at the network center. One of the greatest developments in the information technology in recent years is CD-ROM's and digital storage media library. CD-ROM is one of the best optical information storage devices of electronic publishing, which has very much influenced library and information science around the world, because of its durability and capability to hold large volumes of data, compatibility and its affordability. Several publishers are now making their publications simultaneously available in CD-ROMs apart from the print version. Several reference books, electronic journals backup resources, audio-video and graphic facilities are now available in CD-ROMs. This service can be provided online so that a number of users will be benefited at a time and they can retrieve the information relevant to their needs within a reasonable time frame. It helps the users to keep abreast of
the latest developments in their subjective fields. The network helps the librarians to provide better service in a much better way to maximize information services of the library and the network as well. Individuals affiliated to networks have access to the databases developed at national and international levels, which provides bibliographical details of the sources available. A library that makes effective use of the databases provides better service to its users.

5.4.9 Full Text Access to Publications: The existing collections in most of our libraries are not enough to meet the actual requirements of academic community. It is more so in the case of polytechnic libraries. To supplement the collection, it is necessary to provide access to a large number of journals and full text databases available in electronic form at an economical rate. A network center can play a major role in providing access to the abstract and full text of publications to its member libraries.

5.4.10 Organization of Internet Resources and Providing Access: In the present information and networked society, with skill, one can usually find much information on a particular topic. It is the challenge to librarians then to shift through this mass to determine what is reliable and appropriate and
what is "junk." Whether the information appears in books, articles, the Internet, one can't assume reliability. All resources have to be evaluated. Users of the Internet were initially impressed that they had final useful information of any kind. However, now that anyone with access to a server and a passing knowledge of HTML (Hyper Text Markup Language) can put information on the Internet, the problem has become one of shifting through a mass of advertising material and variety of publications in order to find information of a high quality. Librarians and library users, to make effective use of the Internet, need some criteria as to how to use it in evaluating the information found.

5.4.11 Promoting Discussion Forum: In the network-based environment, it is quite possible to create a discussion forum in different subjects. These help individuals to interact with groups of persons working in their area of interest for solving problem and for enhancement of their skills by participating in the discussions. The discussion forum helps faculty members, students, researchers, scientists, engineers and academicians to interact with each other by facilitating exchange of ideas and promoting communication. This kind of service can be coordinated at the national level by the national network agency in the subject concerned.
5.4.12 Consortia-Based Services: Libraries have been affected by an uncertain financial environment in which resource buying has been restricted, causing them to find out new ways of extending their purchasing capabilities to compensate for reduced budgets. A libraries consortium is one of the emerging tool kits for the survival of libraries. Networking is an essential partner in this exercise as it facilitates access to vast information services. Networks have the potential to improve library services in several ways. The continuous improvement in networking technology helps libraries to reduce the cost of information provision, thus creating new opportunities for the libraries to play their role in information provision to the end users. The consortia-based services help to increase the cost benefit per subscription; to promote the rational use of funds; to ensure continuous subscription to the periodicals subscribed; Guarantee local storage of the information acquired for continuous use by present and future users; to develop technical capabilities of the staff in operating and using e-resources; to create a strategic alliance with institutions that have common interest resulting in reduced information cost and improved resource sharing. Consortium-based services are the way of maximizing the resource base in a developing country like India. In the networking environment, it is quite possible to provide consortia-based service with the coordinating agency.
5.4.13 Pattern Services: The services offered by the traditional library are limited by its location. So the user cannot receive services unless he or she comes to the library. Moreover, in such libraries, the manual operational approach is dominant, while a networked service is open and users have access to the needed information at the online terminals of any site, and the services are all by electronic means, which is quite different from the traditional way. The patterns of services are: the image-textual information service; the distribution of electronic publication; the E-mail service; the Bulletin Board service; the file transferring service; the service of access to online public catalogue; the service of remote CD retrieval; the service of remote TV conference; the service of users electronic forum etc.

5.4.14 Contents of Service: The traditional library concentrates on collecting, preserving and offering documents. Now the focus should be placed on offering information, stressing the development and utilization of information resources. In the network environment, what a library offers is not a whole book or a journal, but the information selected by the users. In the networking environment, main services of the libraries will be pinpointed and specialized in the particular subject.
5.4.15 Developing Information Resources: This is the basis of serving users in the networking environment. Information that a library may offer should satisfy the users community from various disciplines and on various levels. For this reason, the contents of the services must be developed vigorously. Primary information or various types of information should be analyzed, evaluated, synthesized and forecast in order to produce new information, such as comprehensive information and forecast information. Thus the library can offer users retrieval services involving catalogues, chapters, full texts and hypertexts of the documented information. The library occupies a dominant position with resources, arrangement and technology in developing information resources.

5.4.16 Exchanging Information Resources: As a medium, on the one hand the library should deliver proper information from network to users, and on the other it should introduce the generated information to the network, so that it can be used effectively. In other words, the library acts as a bridge between resource and users in information transmission.

5.4.17 Training of Information Utilization: In the networked environment, the users prefer a "do it yourself service", but this service needs preconditions, i.e., the users must possess the right approach. Therefore, it is
one part of the library services to instruct the users to introduce the way of utilizing and exchanging information in the network environment and to teach them how to utilize the network.

5.4.18 Electronic Newsletters: There are a number of electronic newsletters on the Net. These publications usually have a small editorial staff. In addition to short articles, news items, and editorial commentary, electronic newsletters typically contain a variety of reader-submitted material, such as brief comments on current issues, conference announcements, job listings, and other short information items. The issues of newsletters are usually sent out as e-mail messages. These newsletters are typically issued on an irregular basis. Back issues may be stored as files on a network computer where users can retrieve them directly. However, in some cases, back issues must be requested from the editorial staff. Normally, there are no subscription fees.

5.4.19 Network-Based Electronic Serials: There are growing numbers of electronic journals on different subjects. These journals typically have several people on the editorial staff and a formal editorial board. Many of these journals are refereed; they often mirror print journals, containing editorials, scholarly articles, and discussion columns, and reviews. Issues
can be composed of a single article or multiple articles. Single-article issues are often sent as e-mail messages. Multiple-articles issues may be announced via an e-mail message, with users retrieving article files of interest based on this message. Or, if the journal has relatively short issues, it may be distributed as an e-mail message. Some attempted regular publication cycles; many are irregular. Issue or article files may be archived on a network computer so that users can retrieve them as and when needed, or they may be available from editorial board on request. Usually, the journal is not indexed in conventional sources.” Bailey (1992) There is normally no subscription charge for issues distributed on the Net. A subscription fee may be charged for an alternative distribution format, such as floppy disk. How will network-based electronic journals fare in the future? Users do not anticipate that electronic serials will displace print serials in the next ten years. However, they will become an increasingly important parallel form of scholarly communication. It is possible that a significant nonprofit serial publication system will emerge from the efforts of network-based electronic serial publishers. This system is likely to be characterized by low or no subscription fees and the retention of intellectual property rights by the authors. Given the grim realities of the current serials pricing crisis and the
apparent dearth of viable solutions to these crises, librarians have a vested interest in trying to make this vision a reality.

5.5 Challenges and Issues for Libraries Networking

The LICs will undergo for shifts in direction and basic functions. These shifts include:

- From library-centered to information-centered to knowledge-centered;
- The library as an information provider that selects the most relevant information, with the librarian as a skilled information specialist capable of functioning in all related information environments;
- From using a new technology for the automation of library functions to focusing on content utilizing technology for the enhancement of information access and delivery to distributed information systems;
- From technology that supports the library staff to technology that empowers the library user;
- From individual use of technology to its library-wide integration.

Networking is one way for LICs to assimilate the paradigm change. “The challenges for networking can be viewed in terms of vision and operation. The challenges to vision can be surmounted using the three Is -
Intelligence, Imagination and an Integrated approach that brings the maximum benefit to the maximum number of people. The conversion of vision into an operation involves meeting challenges in three areas: human, physical and financial.” Fitzgerald 200414

5.5.1 Challenges before the Polytechnic Libraries

The communication and computer technology are always undergoing rapid change. The mainframe has been downsized to PC, and the PC in turn replaced by the network computer. Similarly, the growth of fiber optic networks has made higher bandwidth available. By the year 2005, the availability of communication satellites will grow to around 500, but the transponder capacity and the bandwidth derived from them is not equal to what a single fiber optic can provide. Hence, there is an urgent need for building a national fiber optic network connecting all the educational institutions' LICs in the country, including polytechnic libraries in the country and in the state of Karnataka.

5.5.1.1 Conversion of Library Contents

The challenges faced in converting library contents into computer readable form involve human and financial considerations.
5.5.1.1 Human Resource: The goal could be achieved through changing the mindset of people at the policy-making level who are focusing their attention on education. In the twenty-first century, India should look upon education as a key infrastructure for economic development. The building up of a national Library and Information Network (LIN) becomes the infrastructure for this infrastructure. The policy makers should consider the national LIN not as an academic activity, but as a lever for economic progress in the future. The important aspects would be training the trainers in using the latest techniques, surveying customer requirements and the creation of content. Most Indian language books are not available in electronic media. The documents in printed form will have to be converted into electronic media. The possibilities range from 300,000 to 3,000,000 jobs in the bibliographic database business alone.

Because of the impact of IT on information processing and dissemination, the operators will have to acquire a multitude of skills from management to marketing, and from technology-handling to information-processing. The personnel working in Polytechnic Libraries in Karnataka should be trained properly.
5.6 Conclusion

Science and Technology (S&T) information is an important asset in the development of a country. The essential requirements for establishing library computerized networks are cooperation, coordination and automation. The slow development of computer application in the libraries of Karnataka is attributed mostly to weak resources, especially manpower and equipment. Many libraries do not have adequate computer man power both in terms of quality and number of staff. Owing to low salaries, libraries have difficulty in recruiting professional staff. The computer staff tend to use software application rather than to develop library software by themselves according to the requirements of library operations. Library automation has thus not been a priority in the library development programmes. These are some issues affecting the implementations of computerized network among the Polytechnic Libraries in Karnataka. An important issue is the training and education programmes of librarians so as to enable them to administer, operate and manage a computerized network. Basic to this idea is the creation of awareness of what computers can do to improve management and provision of services. In the library world, Karnataka has still to work hard to achieve its overall library computerization plan. At present, the libraries in Karnataka have good
opportunities for establishing a computerized network, where they can share their resources, exchange information among themselves by using e-mail, internet and facsimile, and it is more essential in the Polytechnic Libraries of Karnataka.

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