CHAPTER 2
REVIEW OF RELATED LITERATURE

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2.0 Introduction

This chapter is devoted to the review of relevant studies on various facets such as, polytechnic education, polytechnic libraries, polytechnic library collection resources, and services, including networking of libraries. Such studies not only highlight the existing scenario of libraries, but also suggest the trend in theoretical progress as well as in the methodology and techniques used in these studies. A retrospective search of literature was made, using books, journals, LISA on CD-ROM (1969-2004), online databases viz., ProQuest, EBSCO, J-Store, J-Gate and UMI, and other relevant sources were also identified for the purpose of review. Attempts were also made to trace and collect the original articles. The literature under review was published during the period 1969 to 2004. The research on the subject of “Development of cost effective network model for the optimum utilization of resources in polytechnic libraries of Karnataka” is too extensive to review in detail. However the articles collected for the purpose of review have been divided into two major headings i.e. polytechnic libraries and library networking.
2.1 Polytechnic Libraries

2.1.1 Polytechnic Education

Technical education is a basic and essential input to national development and to strengthen the industry, economy and the growth of a nation.

Ministry of Education and Social Welfare, Government of India, New Delhi 1971)\(^1\) (has conducted a survey in 1971 for reorganization of polytechnic education system in India. This report describes the existing organizational pattern as well as the state-wise distribution of polytechnics and reviews the last 150 years of history of technical education, present employment and collaboration with industry, need for the quality improvement of polytechnic education, teaching method, libraries in polytechnics and nature of organization of polytechnic education system, and guidelines for the development of polytechnic education in India. Quiney Lynn (1985)\(^2\) discusses the developments in polytechnic education since 1972 and the various ways in which they are controlled. He further examines the status and structure of legal education in polytechnics and also considers library collection in respect of and the status of librarianship in polytechnics. Bhansali (1995)\(^3\) in his paper describes the basic
understanding of entrepreneurship and entrepreneurs. In all documents related to technical education, the needs of institution-industry linkages have been repeated. In reality the study has identified the role of teachers in education system. Engineering education has failed to attract talented and motivated engineers into its field. In the long run this is bound to affect the quality of teaching adversely unless remedial measures are initiated on priority basis. The paper suggests some practical aspects of teachers training, institution-industry linkages. It also introduces the concept of technical entrepreneurship. Ratnalikar(1995) in his paper examines in detail the necessity of interaction between institution and industry for the last more than one decade and shows that still little has been achieved in this direction. The world has been moving so fast that today not merely interaction but meaningful and effective partnership is the need of the hour. Economic reforms, globalization and world market to which our industry stands exposed today compel the industry and the institutions to move closer and enter into a partnership so that we can boldly face the fierce competition in the world market and survive. If this partnership is not forged, foreign companies will take over our economy, and through this, they will gradually control our politics as well. Hence industry and institution partnership is advocated. Also it is suggested that the only effective and meaningful way
for industry is to establish a private technical University and fund it and to get all Engineering colleges affiliated to it. This will ensure a perfect partnership between industry and institutions and this will make a substantial contribution to the performance of the industry even in the global market.

D. P. Aggarwal and K.B. Rain (1996)\textsuperscript{5} reviewes the development of the technical education in India, various schemes of government of India for promotion of technical education, national policy on education (1986) and the objectives, attainment and future perspective of the World Bank Assisted Technical Education Project. I. R. Natarajan and N.V.C Swamy (1997)\textsuperscript{6}, in their authoritative write-up, cover the evaluation of Government policies on education from the early years of our independence to the 1986 policy statement and beyond. In this comprehensive account the entire gamut of engineering and polytechnic education and the many varied issues and tasks ahead are covered. The authors give an objective account of the current status of engineering education and future prospects. Rastogi and Saini (1997)\textsuperscript{7} explain that quality and reliability can rightly be justified as the life blood of upcoming manufacturing and service organizations. Despite the phenomenal expansion of technical education since independence there exit a mismatch between the competencies of the passed out diploma holders and
the requirements of the employing agencies. This paper tries to identify the probable areas which need to be addressed in order to make an improvement in the existing set-up. It further suggests an innovative approach for effective quality management in Polytechnic education. Sakahrkar (1998) states that the concept of re-engineering has been emerging very fast and that it is widely accepted as a progressive tool in order to achieve a break through rapid and radical redesign. The engineering education system also requires re-engineering to develop true professionalism and to improve the quality of engineering professionals. Major Singh (1999) says that polytechnics are training engineers so as to make the industrial base of the country strong and sustainable. In India, owing to fast growing population, the government cannot provide jobs to all the products of the polytechnics so it will have to build up infrastructure to generate the urgently needed self-employment. There is some draw-back in technical education which needs improvement in the curriculum, particular training, relationship with the industry, research and development etc. For purpose of improving them further the present prevailing situation has been studied and critically examined. Saxena and Gupta (1999) describe the changing environment in which autonomous polytechnics are functioning and the need for participatory governance of the autonomous polytechnics and various aspects of governance of
polytechnic, like concept of governance, composition of governing body, size of the governing body, criteria for selection of the members, appointment of chairman and board member, term of office, structure of the governing body, nature of support the governing body needs, roles and responsibilities of the governing body, accountability, areas of governance, devotion of time, procedure of decision making, role and freedom extended to the Principal in enhancing participation of the board members are briefly described. Ravichandaran (1999)\textsuperscript{11} explains that Technical education plays a vital role in a nation’s development. It imparts technical knowledge, research and technologies transfer. In recent times the technical education system is being enriched by the application of information technology. While Computer application is much appreciated, the utility of telecommunication is much more welcomed. In this paper a brief attempt is made to describe the Internet and its use for technical education system. Jain (2000)\textsuperscript{12} has attempted to discuss the present technical education system. The suggestions such as need-based expansion of facilities, institute-industry interaction, emphasis on skill development, academic audit, comprehensive manpower information system, sharing information through networking of libraries etc. Mittal and Singla (2000)\textsuperscript{13} explains the employment opportunities for the diploma holders in civil engineering are very meager.
There is an urgent need to establish a network with some selected organizations in order to provide appropriate professional experience to the students during the course itself, and that should enable them to possess skills necessary for sorting out successful enterprises. A model for developing skills in the students has also been suggested. **Major Singh (2000)**\textsuperscript{14} explains that innovative techniques are being developed overnight and it is the prime function of the polytechnic library to keep a regular tab so that these libraries remain well stocked with the informative journals which carry all the advances in the technological fields. The present polytechnic staff with barely minimum qualifications to enter the polytechnics are not able to make use of advanced literature, let alone bringing the latest technology to the level of students. **Tulsi and Meshram (2002)**\textsuperscript{15}. Government Polytechnic, Nagpur and Government Polytechnic, Amaravati were granted autonomy under the World Bank Assisted Project on strengthening Technical Education in India by the state Government of Maharashtra. The present study was undertaken with a view to studying the reactions of the faculty of two polytechnics towards the impact of autonomy on the polytechnic system.
Major Singh (2002) conducted an in-depth study of Polytechnic problems and analyzed certain conclusions, which are being summed up under various topics such as: staff in polytechnic, students activities, role of polytechnic laboratories and libraries. Natarajan (2002) in his paper highlighted the engineering achievements that had the greatest impact on the quality of life in the 20th century. It is followed by a "Strength and weaknesses of Technical" (SWOT) education analysis of a traditional engineer, desirable characteristic of 21st century engineers; the distinct phases in an engineers professional development; the anatomy of Research University: stakeholder relationships in the engineering education system; and asymmetries in our technical education system and comparison of experimental and theoretical research. The mega trends affecting engineering education are then explained. The importance of professional ethics and human values is also stressed. Bhattacharya (2002) describes that since independence technology education has been geared for organized industrial sector, for which high-tech manpower was developed, and which had made immense contribution towards industrial development. The positive contribution includes Nuclear power international repute. On application side, the country has produced power plants, Dams, barrages, R&D institution network, Communication network etc. However, despite
these investments, in the sector of community level technology transfer, and support service for basic needs and the meager benefits fail to reflect the performance in the organized sector. The involvement of technical institutes for Community development programmes, orienting the vast user group affordable technologies and developing larger number of trainees for this level and also trainees training programme through institution have already become a part of national policy. ISTE plays a very positive role in this regard. Natarajan (2002)\textsuperscript{19} explains the global view of the goals of engineering education. Some desirable characteristics of the international engineer are then described. The origins, evaluation and content of the relevant national policies are also discussed. A SWOT analysis of the national technical education system is provided. The use of the Principles of TQM in engineering education is explored, covering a vast range of issues in technical education and the strategies for tackling them as well as some mismatches. Finally the implications of some futuristic initiatives in engineering education are described. Sirohi and Sinha (2003)\textsuperscript{20} reveal that Technical education is a good indicator of the development and Socio-economic condition of a nation. Hence there is a greater need for high quality technical education to produce trained manpower in the country. Therefore, the quality assurance process in technical education should
address specific academic issues such as strengthening of research programmes, curriculum development, etc. In this connection, the networking of institutions and the accreditation policy may play a vital role in the quality assurance process.

2.1.2 Polytechnic Libraries

Students need information if they are to be successful in their pursuit of knowledge. The triad education consists of the teacher who manages learning experiences, the environment, which houses and supports the learner and the media with which the learner interacts. Weakness in any part of the triad results in weakened educational opportunities for the learner. The media here connotes learning resources that is, 'any-thing which may be an object of study or stimulus for the learner'. The learning resources, therefore, include books, periodicals, newspapers, pictures, diagrams, maps, charts, slides, films, filmstrips, video and audiotapes, multimedia kits etc. A polytechnic library, therefore, is a place where all types of learning resource, irrespective of their format, are collected, organized and disseminated for use of students, teachers and all their staff members of the polytechnic
B. B. Sharma (1973)\textsuperscript{21} in his paper describes extensively the polytechnic library system in India. P.C. Shah (1974)\textsuperscript{22} states the purpose of polytechnic Education and the functions of the polytechnic libraries. He points out the importance of the library, its services and users. He further describes the present position of polytechnic libraries, their organizational pattern and management, comments on the role of the Director of Technical Education, Principal, Library Committee and Librarian. He also makes some important suggestions for further development. Bagley David (1976)\textsuperscript{23}, in his paper, explains that Polytechnics were developed in the 1960's as a sector of higher education with a bias towards courses leading to vocational qualification. Although their libraries were poorly funded initially and inadequately stocked, by 1975 dramatic improvements had been effected. The character of Polytechnic libraries is closely related to special libraries, since the library staff are sought with subject qualifications. In a number of polytechnics all professional librarians are paid on teaching scale. Revill. Don (1978)\textsuperscript{24} argues that Polytechnic library Services can seldom realize economics of scale. The scale of library provision increases within the educational hierarchy. The staff are employed who become specialists in obtaining resources. Sources of economics available to a firm such as horizontal or vertical integration or cheaper materials prices are often denied
by the libraries. Where libraries adopt other methods potentially able to produce economics, costs appear to remain much the same or rise. Librarians can seldom achieve economics via competition standardization, specialization or marketing. The greater complexity of stock in academic libraries including non-book materials and the presence of several sites, makes economies of scale unlikely.

Huddersfield Polytechnic library development plan, 1979-1982 (1979) report highlights main proposals; introduction; subject specialization; instruction to library users; information services; library support of research; audio-visual resources; automation; accommodation; resources needed. Inder Vir Malhan and Wazir Singh (1980) conducted a survey in 1980 on "Polytechnic libraries in Haryana" to assess and evaluate the polytechnic libraries. The survey traces the historical development of polytechnics in Haryana, including an evaluation of collection and services in these polytechnic libraries. Further it identifies the various drawbacks of these libraries and suggests suitable measures for their better functioning. Hutchinson. Patsy and Kirby. John (1981) briefly describe, with illustrations, the development of a corporate identity-'house style'-for Sheffield City Polytechnic Library, which had replaced previously
autonomous units. They further discuss the responsibilities of the librarian and designer, and technical support. Mel Collier (1982)\textsuperscript{28} presented a paper at the COPOL Seminar IT82: a Polytechnic response held at the Polytechnic of central London July 1982. He picks out some of the general trends in development of Information technology and identifies their relevance to library and information work in Polytechnics. Pat Moody (1982)\textsuperscript{29} discusses briefly the budgeting and Materials selection policies of UK higher education libraries, with special reference to practice at Brighton Polytechnic. He also presents the results of a survey of the Periodicals buying and inter library loan policies of the libraries of all the schools of pharmacy in the country. He considers the reactions of participating librarians to the survey's proposals for the settings up of a cooperative periodicals purchasing scheme and makes some suggestions for making such a scheme take off the ground. L.O. Pleskach (1982)\textsuperscript{30} says that the link between universities research and production is an important feature of the Soviet educational system. An example is provided by the cooperative work undertaken by the libraries of the Odessa Polytechnic and the Kislorodmash research-production combine. The cooperative system has existed since 1974, but has been functioning mainly along traditional lines with each library complementing the other's information sources. Since 1981
there has been a move towards better exploitation of both stacks as a joint resource, and research has begun in the area of the information needs of the users. A.K Anand. (1986)\textsuperscript{31} examines the problems experienced by Kenya academic libraries: finances, availability of publications; manpower; information technology; and user education and information services. Usha Gupta (1986)\textsuperscript{32} has conducted an evaluative study of the growth, development and services of libraries of polytechnics in Haryana and Chandigarh. Mok.Wai.Man. (1990)\textsuperscript{33} carried out a study at Hong Kong Polytechnic Library in order to compare on-line full text databases with other Document Delivery services offered by the British Library Lending Division, UMI articles clearing House, Engineering societies Library, National Library of Medicine, Dynamic Information and data search in terms of cost, time and Man Power involved. Royce. Catherine. (1990)\textsuperscript{34} in his Report explains the setting up of an income-generating unit at South Bank Polytechnic Library that provides a fee-based external information services. Problems discussed include: additional resources overheads and staffing. D. Revill (1992)\textsuperscript{35} discusses the structural plan for reorganization, the aims of learning services, the differences between the library and computing services and the advantages of convergence at Liverpool polytechnic.
N. Macartney (1992) makes a review of UK Polytechnic libraries during the period 1986-1990 focusing on: collections and services, Library Building, staff and staffing, finance, research, cooperation, audiovisual media and Information Technology, including CD-ROM and the changing nature of Polytechnic libraries. B.B. Sharma (1995) in his book “Blue print for a model polytechnic library”, having six chapters, explains in chapter one the concept of polytechnic library, present status, outputs, process and management; in chapter two, describes the objectives of polytechnic library and library services; in chapter three, briefs the resources, Building, Furniture and equipments, human resources and financial resources; in chapter four reveals the acquisition process, Circulation process, Classification and Cataloguing process; in chapter five, explains the environmental constraints and in the last chapter, deals with the management of polytechnic library system. David Livingstone Nakka (1996) conducted a survey on libraries of Government polytechnics in Andhra Pradesh during the year 1996. In that survey, he identifies the present problems in the polytechnic libraries and suggests some solutions for solving the problems.
**Heinisuo and others (1997)** states that, since 1991 the Ministry of education in Finland has been establishing Polytechnics out of a diverse range of vocational institutions. He describes the development of one of these. Satakunta polytechnic, especially its library services and how it has cooperated with the regional Public library in the provision of a joint database of abstracts of theses, called TTIVIS and a CD-ROM network accessible from Public libraries and Polytechnic Libraries. **Z. Benue. Jam. (1997)** in his research study concentrates on the information contribution or publishing by Nigerian polytechnic librarians. It is necessary to know whether the same conditions as exist in universities apply to them as a criterion for promotion since they now collect the same amount of salary and allowances. It is nearly five years since such conditions were laid down. **G.N Datar (1999)** conducted a survey on “Polytechnic Libraries in Dharwad District” in order to assess the various facilities available for library services in the polytechnic libraries located in Hubli and Dharwad. It is noticed from this survey that except a few, all the polytechnic libraries are in a very pathetic and non-functional situation. He also given some important suggestions for the purpose of implementation at the earliest possible. The Paper on “Networking of physically handicapped polytechnic library” by **Mallinath Kumbar and Others (2000)** attempts to give a
proposal for networking of JSS Polytechnic for the Physically Handicapped Library, which, with a prime objective of fulfilling the information requirements of disabled students and teachers has started its computerization work very recently. It is proposed to introduce network based information services in order to maximize the utility of library resources and services and thereby avoid the duplication of work, wastage of men and material resources and to give a flexible working environment. The paper also explains the significance of networking, resource sharing, network plan, need, implementation, requirements of software and hardware.

2.1.3 Polytechnic Library Collection Development

Walker Gregory (1983) gives a preliminary review of the findings of a survey of UK national, University and polytechnic libraries: the consequences of expenditure cuts for library collections supporting Russian, Slavonic and East European Studies (RSEES). This survey, carried out by the Advisory Committee on Slavonic and East European Materials of the standing conference of national and university libraries, includes information about the libraries affected by expenditure cuts in provision of RSEES materials and the nature of effects on materials provision and effects on
other services. B. Burton (1992) in his paper explained the profile of the Hong Kong Polytechnic library videodisc collection. He discusses collection management, interactive videodiscs, the conversion of slides into videodisc, and the Hong Kong Polytechnic library slide collection. Hitchingham (1996) examines some of the implications of developments in electronic Publishing on the traditional functions of collection development and collection management in libraries, acquisitions in particular, with particular reference to Virginia Polytechnic Institute and State University.

2.1.4 Polytechnic Library User Studies

Edna. Blackie and Smith. Joen.M (1981) have conducted a survey of a small group of polytechnic undergraduates. They interviewed students over a 6 week period in order to investigate their information needs and their approaches in meeting them. Moreover of academic staff were then interviewed in order to discover their individual perception of the student information requirements. The findings are summarized with particular reference to the role of the libraries in solving the student information needs. The relevance of the findings to the planning of library user education programmes is also discussed. Joan M Day (1983) conducted a survey.
and it was carried out by students on a Bachelor of Librarianship to examine the variety of other courses. The results were also compared with their own information-seeking behavior. All students were found to have a considerable amount of direction from the academic staff, and have used their polytechnic library as their main source of information materials. But they were not at all readily prepared or able to choose alternatives. Considerable differences emerged between the courses, which may be related to curricula organization, particularly assessment methods. The value of user study for librarians is discussed therein. Shepherd-John (1983) in his report, explains the issues relating to the polytechnic lecturers -- their information needs and information gathering in relation to teaching and research. The main part of the research is based on a postal survey of historians in 31 UK Polytechnics. Types of material, location of references and methods of obtaining material for teaching and research, as well as patterns of library use are considered. McDowell. Elizabeth (1984) states that many part-time students did not use the polytechnic library that lecturers play a key role in encouraging or discouraging wider reading and library use; and that the library needed to promote its services actively. Joan Day and Liz McDowell (1988), in this small-scale study, interviewed final year science and technology students at Newcastle upon Tyne Polytechnic in
order, to discover their perceptions of their information needs and the information sources available to them. Although all students made some use of the library, it appeared that many of their courses were highly directed, and that they laid little emphasis on independent learning or information skills. **O.B. Ikoro (1992)** in his study examines the information seeking behavior of the academic staff of the College of Administrative and Business Studies (CABS) of Kaduna Polytechnic, Nigeria, in order to determine the strategies that need to be developed by librarians so as to satisfy the information needs of these users. The study found that most academic staff still depended solely on textbooks as their source of information; and therefore suggested that their attention should be directed towards journal articles that provide more up to date information. Most academic staff were also found to prefer independent searching to involving librarians, and many of them often leave the library disappointed due to their limited knowledge of the library's operations. **M. Wakeham and others (1992)** conducted a survey in two Health Districts through the two Associated departments of Nursing and the Midwifery Education of Anglia Polytechnic. The study was carried out by means of a questionnaire distributed to a convenient sample of nurses and student nurses. 50.15% (501) of the forms distributed were returned. The analysis of the survey
shows that the respondents most often need information is limited to patient or client care or their own personal interest. They are least interested in any other information that relates to new courses or jobs or preparation for interviews.

2.1.5 Information Services In Polytechnic Libraries

Whether library be public, national, academic or special, its main objectives and functions are to collect, organize and disseminate information to its users effectively and efficiently. Application of IT in the organizations and services of library has brought about a sea change in the functioning of libraries in the last two decades throughout the world. Library service play a very important role in creating new thoughts. A library user absorbs the existing thought by reading books and other materials, i.e. by library services. The library users, in order to create new thoughts subsequently again absorb these new thoughts. This chain of creating new thoughts is continued so far as active library services are available. Hence library service is a vital link communication of thoughts. In this connection a lot of information is published, and some of it is presented here.
Carolyn. M. Hall (1977)\textsuperscript{53} in his study explains the development of information services in polytechnic libraries and the services provided and/or purchased by polytechnic libraries. He considers that there is still some room for the polytechnic library to offer additional services, although computerized services will become more evident this may not be as quick conversion had been imagined. The most likely development would seem to be an increase in subscriptions to group profiles. S.M.W. Guy (1977)\textsuperscript{54} carried out a survey in 1977 to ascertain what information services, including reference work, user education, current-awareness services, provision of bibliographies and printed, duplicated or audio-visual guides in the field of the humanities, were being offered in university and polytechnic libraries in the UK. Revill Don (1978)\textsuperscript{55}, in his paper describes the polytechnic library services, functions of professional staff, competition, standardization specialization, and marketing. Heery Michael (1987)\textsuperscript{56} examines the growth of research in polytechnics. He considers the extent to which polytechnic libraries are able to support academic research. The role of large scale research collections, such as existing in many university libraries, is discussed. He argues that polytechnic libraries can best support research not by emulating the collection-building policies of the universities, but rather by developing active information services. He uses a case study
from Brighton Polytechnic to demonstrate how a successful service has been offered to researchers in the subject field of accountancy, business and management. Analysis of on-line search records and survey of academic staff is used to evaluate the efforts of Brighton Polytechnic library so as to provide a useful service to academic researchers. Haynes, David (1988), in his survey, looks at the markets for on-line services in the UK. The project surveyed university, polytechnic and public libraries top databases, searching expenditure by subject and by database host. Tommy Yeung and Others (1989) conducted a study to find out the availability of CD-ROM and how it has changed the pattern of accessing information in the Hong Kong Polytechnic Library. Forrest-Vicki, (1990), in his study, since 1987 at the Center for Communication and Information Studies, Central London Polytechnic, has been monitoring on-line use in the UK. The technique used involves monitoring expenditure by representative panels of on-line using institutions (public, university and polytechnic libraries). Data for percentage expenditure, by subject area, is presented for July-Dec 1987. The 10 highest-earning DIALOG data bases, based on the 1988 expenditure of 13 universities, are shown with corresponding connect hour rates and total expenditure. He suggests that such a technique could help to establish price-use relationships for on-line databases. Poon Paul (1990) explains that the

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system of, Inter Library Loans is regarded by some librarians as the most common and productive activity of library cooperation. This mechanism has been used extensively by the library of the city polytechnic of Hong Kong. The library forms an informal network with other academic libraries in Hong Kong and borrows materials from them; it also uses overseas help. A statistical analysis is provided to illustrate the features and trends of the inter loans service during the past few years. Cox John and Hanson Terry (1992)\textsuperscript{61} discusses the operation of library current awareness Services specifically designed to enable downloaded records to be incorporated by the end uses into their own personal data base. He draws heavily on the UK experience of the practice based library current awareness services of Portsmouth Polytechnic and the Royal Free Hospital School of Medicine. He considers local requirements of Software. Additional factors include staffing, charging for the service, promotion, creation of search profiles, running of problems and mailing of results, record keeping, document supply, effects on periodicals subscriptions and impact on users. J. Knowles (1993)\textsuperscript{62} presents the results of a research project carried out at Liverpool Polytechnic library services in summer 1991 in order to analyze the current CD-ROM facilities and to evaluate the CD-ROM networking systems currently on the markets that are best-matched to the polytechnic needs.
Roshan Raina (1995)\textsuperscript{63} explains application of TQM approach in the context of library and information services. Wanjun (1998)\textsuperscript{64} points out the important role of the internet envisaged the Chinese people's republic in the country's future information services and education. Also briefly notes the plans for Internet use at the Shanghai second Polytechnic University in providing open access for staff and Students.

2.2 Library Networking

2.2.1 General Studies on Library Network:

The exponential growth of information in all fields of knowledge, heavy demand for information, accuracy of information and the need for the newest information have become the erroneous task of the library. The individual library cannot meet this challenge with its own resources. The networking of similar libraries is imperative in order to overcome this challenge and to fulfill the users' needs. The fastest growth in electronic information makes easier the resource sharing of information. Networking of libraries improves the activities such as cataloguing, database creation and staff development. In addition to that, it reduces the financial burden by sharing information resources. There is a plethora of literature published on library networking. Some of it is reviewed as under.
Heroux Marlene Sue, (1985)65, in his paper, describes the relationship between automation and networking, examining the present and future needs of academic and research institutions and the role of networking in meeting these needs. John.A MacColl (1989)66 explains a project aimed at promoting the UK's Joint Academic Network (JANET) to its member libraries. He explains the functioning of the project and its objective and gives general information on the network itself. He looks at what use libraries currently make of JANET, and examines the general question - What are functional and service applications potentially available to libraries over Wide Area Networks (WAN)? Yen.Yi.fan. (1991)67 details the history of medical libraries cooperative network, organisation, education and services of the medical libraries cooperative network in US. Z. Gaca. Dabrowska (1993)68, in this paper, gives an historical outline of the development of academic libraries in Poland since the founding of the first such library in 1964. This is followed by an account of the period from 1945, which includes an account of the legislative framework established by the legal Acts of 1946, 1968 and 1990. He discusses the national library network, which these acts set up, and the requirements they made for libraries in order to cooperate in collection building and provision of information services. Pasanen Tuomainen. I (1994)69 describes the work,
scale and structure of the Finnish University and Research Network, (FUNET). FUNET services include e-mail and transmission of bulk data, such as measurements, images and animations. FUNET provides access to the catalogues of the Finnish academic libraries. Feye Stukas. J. (1996) reviews library computerization and network projects in the state of Minnesota with particular reference to library automation vendors in the state; multi type library systems; post-secondary libraries and academic libraries; state government libraries; Internet in Minnesota libraries; telecommunications and statewide online system legislation and funding; and State Library agency involvement and standards for library automation.

Pramod Kumar and P. O. Arora (1996) gives an account of the objectives, services and infrastructure at INFLIBNET programme. It also explains how the programme, with financial support from the UGC, is contributing towards computerization of University libraries in India by providing grants and training. The problems faced in getting data from the libraries and putting it into a centralized databases etc., are discussed threadbare. Ramanis (1996) paper presents the essence of lessons learnt by running the BONET over the last few years. BONET has been able to contribute to the activity concerned with the absorption of new technology by practitioners in the library and information science and also future plans
of activities. **R. Raghavan and Jayasri Raghavan (1996)**, describe in detail the objectives, structure, products, services of MALIBNET. Its linkages with INSDOC and the users of the Network. MALIBNET is claimed to be a model network that has become operational in a short span of four months after it is registered as a society and that too without government support except that of INSDOC. **S.I Fuzzlulu din and Chikkamallaiah (1996)** reviews the basic functions related to Indian library networks, internet library services, components, services and the facilities of internet implication of library network functions and future expanding ability of libraries in India. Proper management, support functions and the role of Internet services are studied. An attempt is also made to correlate the Indian library network system and the Internet library services available at the higher education institutions and the universities around the world. **T.M.K. Gandhi (1996)** makes a survey of the importance of catalogue use studies, particularly in the context of database development for networking. A literature review reveals that most of the studies are conducted in western countries which may be broadly grouped under three categories; user studies; studies relating to search facilities and environments with methodology. He stresses the need for more such studies in the context of libraries in India, particularly in view of library network
development in the country. S.R. Thakore (1996)\textsuperscript{76} explains the databases that are being developed by ADINET and the information and communication services which it presently offers and plans to offer in the near future to its member libraries and other users. ADINET, although a very recently started network, has taken quite a few initiatives to play a very useful role in library resource sharing and in information dissemination.

N.N. Colyar and others (1997)\textsuperscript{77} examine the inter institutional use of the network among 14 of the connected academic libraries in orders to determine if a correlation exists between overall network relevance and the degree to which a library's online catalogue is searched from an external point. Although no reliable correlations between external OPAC use and relative significance emerged from the study, both sets of derived figures provide useful information for both network and library administrators as they plan resource allocation, online service provision and other related network enhancements. M.B. Jensen (1998)\textsuperscript{78} describes the DanBib system, a nation wide union catalogue, offering a number of common functions and a network to all Danish public libraries and academic libraries. DanBib is a common bibliographic superstructure for all Danish libraries, and comprises: a bibliographic database accessible to the general public (the DanBib base)
which contains information on stocks and locations of materials; a network accessible to the public (BibNet) which makes the library community form a single whole; and common functions which improve interlibrary cooperation, promote re-use of bibliographical data and facilitate connection to other databases. Q. Zhu (1998) observes the academic libraries in the Chinese People's Republic and shows how they are transforming traditionally isolated operations by initiating an integral library system to connect all academic libraries nationwide and to connect them to other information networks abroad. The article also recommends the development of a 3-tier network at the national, regional and campus levels and outlines the major goals to be realized in the next 5 years. Arora (2002) argues that, resource sharing amongst various institutes and Sharing of resources at Physical level involves time, money and displacement of personal, whereas information technology and networking provide the most efficient mode of communication and interaction.

Sirigindi Subha Rao (1999) highlights the networking scenario in India by listing the general communication networks viz; INDONET, NICNET, GPSS, RABMN, I-NET, and specialised information networks viz; ERNET, INFLIBNET, DELNET, SIRNET, CALIBNET, MALIBNET,
MYLIBNET, etc. He concludes that no doubt India has drawn up ambitious plans but it has to wait and see what benefit it could derive from employing these facilities in improving the socio-economic status of its citizens. Prakash (2002)\textsuperscript{82} says that the information networks are the order of the day. The specialized information networks are required to provide specific information for a specific group and to provide pinpointed information. The Utility of information in such Network is more, since the target group is known and the network is designed to meet their requirements. He also provides Indian Scenario of such networks with special reference to aerospace Information networks. Further, he suggests that cooperation with the international agencies will facilitate for establishing the country so as to achieve this goal. Sewali Bhuyan (2003)\textsuperscript{83} explains that information Technology has made significant strides in the way of acquiring, storing, reviewing, accessing and disseminating information. The advent of computer networks ushers in a new path to the library and gives a new dimension to the traditional jobs of library such as information retrieval and dissemination. This paper also describes the overall changes in the field of library by the advent of computer network. It discusses the phenomena of computer networking, emergence of Internet, potentialities of Internet and other revolutionary innovation and technologies and their importance on
libraries and information centers. This article highlights some of the common problems of the adaptation and absorption of network technology in India with special reference to North Eastern region. Lakshmanan and Thangamani (2004)\textsuperscript{84} tell us about network security, and hold that any system security is very essential. If there is no security for the system, the entire system will collapse. The various levels of security mechanism are described in detail this paper.

\subsection*{2.2.2 Impact Of Network On Libraries}

Information and Communication Technology (ITC) has made a great impact on library and information service activities. Now a days a library user find himself or herself equipped with the information whenever and wherever he/she needs it. The following review discusses the impact of network on libraries.

J. Eustis (1998)\textsuperscript{85} discusses the issues relating to access to and use of networked information resources and services affecting teaching and learning; how and where users connect to the network; frequency of use of information resources on the library Web site; effectiveness of electronic
help services compared to print or human help services; and annual information technology expenditures on the campus. K.S. Summerhill (1999)\textsuperscript{86} in his paper discusses the impact of technology on resource sharing: experimentation and maturity and also focuses on the impact of internetworking on academic research libraries with special emphasis on collection development and resource sharing. Ojha D.C. and Others (2000)\textsuperscript{87} take note of the changing scenario of libraries with special reference to India and the application of information technology during the last decade of the 20\textsuperscript{th} century besides discussing the various IT gadgets likely to affect the library and information activities in the 21\textsuperscript{st} century. Surya Nath Singh (2002)\textsuperscript{88} explains the impact of various components of IT on biomedical information centers and libraries, users and library and information center professionals. He attempts first to identify the national programmes and policies of the government of India, and thereafter to analyze and evaluate them for the development of biomedical information centers and libraries in India. Kannappanavar and Mathad (2002)\textsuperscript{89} explain the concept of Internet and its historical developments, the steps involved in the organization of Internet, Internet based information about academic libraries and its services.
2.2.3 Networking of Libraries

Problems and Prospects: Now the world is in the information age. It is commonly observed that information and its associated technologies are playing more and more important roles in socio-economic development, and that a nation that does not keep pace with the latest advances in information and communication Technologies will be left behind. Like most advanced countries in the world, India is drawing up its own information superhighway system and has greatly promoted the computerization and networking of library and information services.

Data communication is an integral part of the modern information storage and retrieval systems in terms of their capabilities for online access. In the initial stage, the information network, which operated in an offline mode, was in a quarry it was lidded into a computer which was later matched with the database for relevant bibliographic records. The search result consisting of such recodes on the subject of query were generated as output. This process was not satisfactory for effective and efficient retrieval of relevant records. Further progress in computer and communication technology has made it possible to carry out this process in an online interactive mode wherein a user can access an online host via micro
computer from a remote location and can define and redefine his query based on the search result obtained till he is fully satisfied with the final outcome.

T.S. Rajagopalan (1977)\textsuperscript{90} in his paper, discusses the individual library operations that can be preserved, and the intellectual interests of participating libraries that can be protected in network environment. The networks are the results of an urgent need faced by libraries, as their collection is insufficient to meet the rightful demands for health information from professionals. These have become the essence of the operation of modern day libraries to meet the complex and demands challenges from users for varied types of information. These are regarded as the inevitable solutions to cope with complex situations. Crisp. Lorna. and Sekhon. Julie. (1983)\textsuperscript{91} outline the development of the network of technical and education (TAFE) college libraries, beginning with the original Sydney Technical College Library. They describe the expansion of the state wise network, the development of multimedia and specialized collections, and the evolution of centralised technical service branches. Sloan. Bernard. (1984)\textsuperscript{92} describes the setting up and development of the Statewide Library Computer System (LCS) now maintained by the University of Illinois office of Administrative Information Systems and Services. It is a Computer based network, used to
facilitate resource sharing among libraries in Illinois. At present, 25 academic libraries supply information to regional libraries, and the Illinois State Library also uses bibliographic data for LCS and the system. Public access to LCS is via terminals in libraries and academic departments and it can also be obtained by dialing direct via a home or office computer. **Holligan Patrick. J (1986)**\(^9\) conducted a survey of 6 universities and 2 polytechnics. It was carried out in order to investigate the degree to which they use networks for computer-mediated communication. JANET (Joint Academic Network) provides the practical model on which the essential functions of a physical and conceptual network are based. **Medina Sue.O (1990)**\(^9\) in his paper describes the regional library network, its problems and uses in the state. **T. Viswanathan and Others (1991)**\(^9\) review the development and growth of information networks in India with particular reference to INFLIBNET, CALIBNET, SIRNET and SARNET.

**Buntz Elisabeth (1992)**\(^9\) reports the component, structure, and services offered to users of the Joint Academic Network UK. **E. Hoffman (1993)**\(^9\) examines the resource sharing from the perspective of academic libraries and in the light of recent theories of organizational development. Effective service for the library's primary clientele is the appropriate
measure for resource sharing activities. While the network structures are in position to ensure that any citizen may obtain a copy of any published item required, there is a gap between possibility and practice. He analyses this gap in order to identify the tasks involved in bridging it. J. Mitchell (1993)\textsuperscript{98} gives the history - growth, development, services and products - of the Ohio College Library Center network. L.J. Haravu (1993)\textsuperscript{99} presents an overview of recent developments in library automation and networking in India, and raises issues believed to be basic in nature as a contribution to the on-going debate and discussion on the library automation and networking in the country. R.C. Gaur and Others (1994)\textsuperscript{100} explain the benefits of networking technologies for libraries and information centers and describe the networking facilities at CRRI, which includes an in-house LAN, DELNET and SIRNET. The benefits of computer networking in terms of resource sharing, acquisitions, cataloguing, and reference services, CAS, file transfer, E-mail and information retrieval are discussed. The problems of network participation viz., non-availability of databases at participating libraries, standardization, untrained staff, budgetary constraints, hardware etc., have also been discussed. B.M Meera (1994)\textsuperscript{101} in her article attempts to find out what LAN and WAN are and the significance of WAN and LAN in the changing scenario of library resources sharing activities. The hardware
and software requirements for the effective implication of WAN technology have been highlighted.

S. Yoo (1994)\textsuperscript{102} attempts a structural analysis of a multi-type and multi-level library network within the framework of a regional interlibrary loan (ILL) system. J. Wagstaff (1994)\textsuperscript{103} conducted a survey on the use of computing technology in UK academic libraries. The topics surveyed included: uses of the Joint Academic Network (JANET); reasons for non-use; availability of LAN terminal; online search ability of individual library catalogues. IASLIC (1995)\textsuperscript{104} conducted an important seminar on networking in 1994, the proceedings of which seminar are discussed under the following headings; theme facets and issues for discussion on general problems of networking; costing in networking; engineering college networks, curriculum for library network, networking for petroleum industries, environmental factors, discussions, recommendations, reports of meeting of special interest groups and a panel discussion report. R. Heriard (1995)\textsuperscript{105} in his article which is a valuable contributed to a theme issue on Ethical issues in librarianship, discusses new ethical concerns arising for providers of reference services in a cooperative, statewide, multi type library network environment such as that envisioned in Louisiana comprising
academic, public and school libraries. He considers how cooperation can generate conflict in reference provision. He also describes the American Library Association’s guidelines for providers of information services that define areas of possible conflict. It is important that some method is established for providers of reference services in a cooperative statewide, multi type library network to resolve ethical conflicts so that all participants in the network cooperate to the full. K.T. Lam (1995) explains the future trends in CD-ROM networking as more CD-ROM database publishers and online service vendors provide their databases on the Internet, and the adoption of the client server approach and the development of the standardized of information retrieval protocols (Z39.50) become more widespread. He concludes that these developments will enlarge the user base and change libraries' collection development strategies.

S.S. Murthy (1996), in his paper on “Library networks in India” attempts an overview of the development of library networks in India. He mentions the efforts made by the planning commission, Government of India, to promote resource sharing among libraries in the country. The present scenario of library networking has also been briefly presented. The problems of operationalizing library networks such as, retro conversion of
holding data, non-availability of suitable software for operating large
databases and online searching in a WAN mode at an affordable price by all
the libraries, lack of adequate standardization, non-availability of adequate
manpower training facilities of library staff participating in the network
programmes. Finally, some of the possible solutions are suggested. J.W.T
Smith (1996) offers a brief history of the Joint Academic Network
(JANET) in the UK and describes the Electronic Libraries (eLib)
Programme funded by the Joint Information Systems Committee (JISC) of
the Higher Education Funding Councils and also explains the other projects
funded by JISC to promote the use of networks and information technology.
M.A. Kumar and T.S. Kumbar (1998) describe the activities of the
INFLIBNET center at Ahmadabad along with plans and strategies for the
future.

B.D.Panda (1998) provides an action plan for a networking
programme for the State of Orissa, which would Provide Public libraries
with network facilities by using LAN & WAN technology. Sanjaya Mishra
and Vashisht (1999) review the state of local library networks in India.
They describes the objectives, facilities and services offered in the local
library network. The library network discusses ADINET, CALIBNET,
PUNENET and MALIBNET. He concludes that the development of these local library networks is not similar. DELNET is growing fast by adding new services to its members. Other library networks in India, as a reference point, could emulate the success of DELNET. T. Rajagopal (2001) conducted a survey on Agriculture Library system in Andhra Pradesh and identified the drawbacks of the existing system. He explains that it has become very imperative to share resources and to go in for networking of agriculture information system in Andhra Pradesh. H.K Kaul (2002) in his paper - "Proceedings of the First Indian National Round Table on Modernization and Networking of Libraries in India", discusses the following themes viz., National Library, Public Libraries, Delivery of Book Act, Modernization and Networking of Libraries in India and Electronic Libraries in Rural India.

K.A Raju (2002) describes the resource sharing and networking and also some important aspects of practical librarianship. Explosion of literature, constraints on the budget and other material facilities are compelling the library authorities to opt for resource sharing. The experience of the National Institute of Rural Development, Hyderabad in networking with state institute of rural development spread all over the country, is
Jacod D Vakkayil (2003) discusses reviews the issues and challenges concerning automation of Libraries in North East region. On a closer analysis, one would realize that the transition from traditional libraries to networked information centers pre-supposes adequate trained manpower. The library of the future will certainly be managed by the library professionals of the tomorrow, who are undergoing training in our library schools today. Manoj Kumar Sinha and Jayant Bhattacharjee (2003) explain the concept of Library automation factors, areas, steps factors, problems and solution of library automation and networking with special reference to Assam University library, and also explain the scenario of application of information technology in library services, library networks, meaning needs, methodology or planning and steps taken for library automation and networking for computer based library and information services.
2.2.4 Design and Development of Library Network

Library networks have grown up rapidly during the last thirty years in different geographical environments in order to cater to the specific needs of the users. In the United States, there has been a proliferation of library networks. Library networks in other countries are also growing; several models have emerged, and these are used to provide specific services. Not all networks conform to the essential functions of library networks. However, the essential functions should include the promotion of resource sharing, creation of resources sharing tools, like union catalogue development, rationalization of acquisition of library materials and maintenance of international standards for creation of records uniformly. Hence, it is essential that a librarian should be able to join different types of networks and develop and design the network. In connection with this, the following information was published;

B. E. Markuson (1979) in his paper “Cooperation and Library Network Development” discusses all aspects of network development, management, problems and solution for network. D.R. Grover (1981), in his paper, describes the process of establishing an organised network of
public libraries and examines the subsequent development of libraries in the USSR. His paper discusses on: the growth of public libraries and the role of the Council of Ministers and the Ministry of Culture in their organisation; the work of specialised libraries and academic libraries; and the work of the Lenin Library is highlighted. Hamann. Kees (1983) proposes a detailed plan to bring all libraries in the Dutch province of New Zealand together in a single cooperative network. A.M. Pathan and C.R. Karisiddappa (1989) explain the health information to their users. They have elaborately pointed out the problems of health science libraries and have suggested some network model for health science libraries in India. Ron. Chepesiuk's (1990) project aims at linking all South Carolina's public, academic and special libraries into a single network, providing access to all the library resources in the state. At the heart of the system is LION (Library Information Online Network). Stone. Peter. (1991) emphasizes the origin, management and capabilities of the UK Joint Academic Network (JANET). P. Barul and B. Saibaba (1992) Describes the need for cooperation among Indian engineering and technology libraries, and suggests the plan for cooperation and networking among these libraries in India. J. Cargill and R.D. Hay (1995) shows how the Louisiana Online University Information System, a statewide academic online library network in Louisiana was set
up. T. Viswanathan and R. Jayasri (1994) describes the setting up of MALIBNET, as a joint venture of academicians, scientists and technologists in libraries in and around Madras, which provides information at a low cost to the users. He highlights the benefits derivable from MALIBNET and notes the activities of the Indian National Scientific Documentation Center (INSDOC) as the executing agency for the MALIBNET project. T. Sonkkila (1994) provides a background to the development of the library information network for Finnish research libraries (LINNEA). H.K. Kaul (1996) mentions the objectives and establishment of DELNET, various activities of DELNET, such as promotion of database creation among member libraries; resource sharing and standardization. Information on funding and the hardware/software infrastructure is also provided along with databases and services.

M.A. Siddiqui (1996) has prepared a model plan of an interlibrary loan network (ILLN) among academic libraries of Saudi Arabia, and also discusses its organizational structure, governance, operational requirements and finances. Y. Shraiberg (1996) illustrates how six large science and technology libraries Moscow have joined together to plan the Russian Federal Library Information Network Project, LIBNET. LIBNET allows
considerable improvement in the quality of services offered to scientists, specialists, students, and all information users in the Moscow region in particular and Russia in general; and this will be the first stage in the creation of a library computer network for the whole country. Roshan Raina (1997)\textsuperscript{130} has done a survey of assessment of library and information resources and services in the management schools of India in order to ascertain the feasibility of their coordination and standardization for effective resources sharing and networking. This book provides an information about the growth and development of management education vis-à-vis library, a comparative study of the resources, facilities and services of the libraries of national level management education institutions of India, and also suggests a networking model for resources sharing. M.A. Gopinath (1998)\textsuperscript{131} discusses the role of an information specialist towards qualitative access to information in a library network. He presents a basic set of components of a network and delineates a module for information professional on library and information network. He gives a call for a conductive approach to organization of information networks.

Chich-Ching Emily Yong (1999)\textsuperscript{132} discusses the problems encountered in the establishment of NBINET and the solutions related to
computers and networks, NBINET utilization on the Internet and user expectations of NBINET. **Kaul (1999)** describes the development of Delhi Library Network (DELNET) and its services. DELNET is a growing resource sharing service in the Delhi region, offering a wide range of product and services to facilitate the exchange of information among libraries. **Gorman and Rowena (2000)** describe the standard approach adopted in library networking or partnership models which is neither developmental nor evolutionary. Whatever be the effect of adopting the standard approach, development and are essential to robust, contextually responsive partnerships. Using a set of knowledge model, first proposed by Owen and Wierex, this paper suggest an approach to the modeling of networks in which librarians enter at one point and then move along a continuum, ideally ending in an advanced, integrated knowledge environment model. There is little evidence to show that some library consortia in Asia are moving networks of the traditional static variety. **Zensei Oshiro (2000)** reveals that the Ministry of education, science, sports and culture of Japan envisioned a scholarly information system in 1978. In order to realize the system, the ministry established Foreign periodical centers and the national center for science information system (NACSIS). They have been playing a vital role in most of the recent
cooperative programmes and networking in Japanese academic libraries. Siddamallaiah (2002)\textsuperscript{136} describes the strategic needs for the development of Networks and problems and prospects of establishment of the Karnataka State Library Association libraries network and also explains the vision of KALA NET and Action Plan for network Services.

2.2.5 Network Based Information Services

Network, Internet and associated technologies offer existing possibilities for the librarians to deliver information to users desktops and integrate library services by using web as the common user interface. A primary requirement for Internet based library and information services (IBLIS) is the existence of an organization wide Internet connected to the internet. In the absence of this library, LAN can be easily converted into a private Internet to offer IBLIS within the library. A librarian can contemplate several interesting applications over a network and Internet. These include web access to OPAC, Current Awareness Service and SDI bulletins, local web access to externally purchased databases, CD-ROM databases, remote information services, etc. The large quantity of information is readily available in a network based information services, and
some of them are as follows: A.C. Mitra (1996)\textsuperscript{137} approaches the twin objectives of library automation and networking through the network route and E-mail route. The author has dealt with on the services and development of software, database, and network in detail. E. Sundarajan and Others (2003)\textsuperscript{138} conducted a case study of Indira Gandhi Center for Atomic Research Library (IGCAR) Kalpakkam. This study briefs about the latest trends in information services offering IGCAR Library as a case study. The infrastructure requirements, dissemination of information in electronic form over the network, CD-ROM networking advancements, Digital content creation and management using metadata standards, like MARC or XML, are highlighted. T.Yadav (2003)\textsuperscript{139} describes the importance and use of Internet for information search and services, which is beneficial to certain libraries and information centers.

2.2.6 Automation and Networking in Polytechnic Libraries

Library automation is the process of automating the library functions using the modern technology like application of computers, telecommunications, computer softwares, micro forms of storage. A media, human interface and others micro information technology, which helps in
information storage and retrieval purposes. 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. Therefore computerization is the only answer to organize and disseminate the tremendous flow of information in a systematic way. There is an enormous literature on library automation. Almost all this literature deals with how to manage libraries for a better profit.

Brophy Peter (1977) explains background information on the automated acquisitions system at Teesside Polytechnic Library and describes the use of the system in order to provide SDI services. John Akeroyd (1982) considers the information aspects of information technology with particular reference to polytechnic libraries. The automation of library housekeeping is examined and the library catalogue assessed. Also on-line information services are discussed, and the slow development of on-line services is criticized. McLean. Neil (1982) discusses information technology and its fundamental importance to librarians, as their traditional monopoly on certain information services is being challenged. For librarians working in polytechnics, there is an urgent need to look at the educational
process and the likely effects of information technology on teaching methods. Mel. Collier (1984)\textsuperscript{143} in his paper - the Polytechnic of Central London has developed and installed WAN, connecting libraries on 6 sites. The network is linked to SWALCAP for circulation control, and cataloguing services. Elizabeth Taylor (1985)\textsuperscript{144} describes the various activities through which the Library Technology Center disseminates information: demonstrations; enquiry, information services through network etc. H. Shuster (1992)\textsuperscript{145} describes the Gordon library and the college computer center at Worcester Polytechnic Institute, Massachusetts. These libraries have developed a library program accessible to all members of the college via the campus network that enables them to receive or request specific library services via a terminal or PC from anywhere connected to the network. Bhattacharya and Meenakumari (1997)\textsuperscript{146} explain that the technical education is a very important component of the technical and vocational education sector. But the self improvement avenues for our polytechnics is minimum and the faculty and the students lack of awareness of modern developments. Also they projects a new vision for polytechnics with the capability to develop on sustainable basis. To translate this vision into reality, the technical education system must develop on a sustainable basis. To translate this vision in to reality, the technical education system
must adopt strategies and tools that will produce technicians with much broader perspective and more up-to-date information, and then information technology can play a major part to in reaching this end.

The foregoing review of the related literature has shown that, for nearly thirty five years, libraries have sought to discover the determinants of cost effective network model for the optimum utilization of resources. The literature has also shown that not a single study has been conducted on the related research topic in developing countries. The research reported here is an attempt to propose “Development of cost effective network model for the optimum utilization of resources in polytechnic libraries of Karnataka”.

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