

**Strategic Development Plan for Adoption of
Information and Communication Technology
(ICT) in the College Libraries of Mizoram**

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**Library and Information Science
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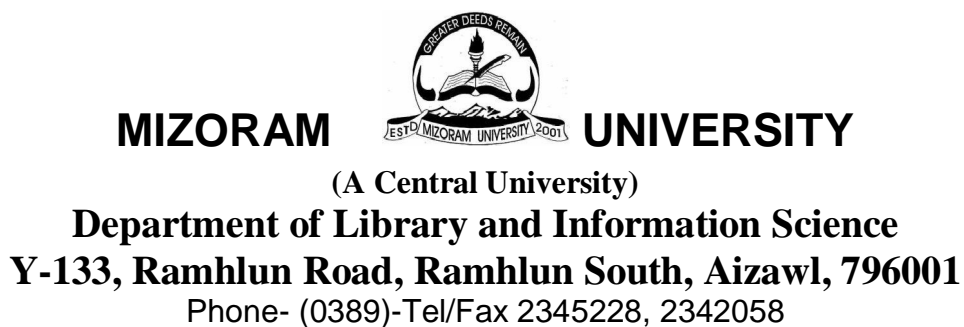
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DECLARATION

I hereby declare that the thesis entitled “Strategic Developmental Plan for Adoption of Information and Communication Technology (ICT) in the college Libraries of Mizoram” submitted by me has not been previously formed the basis for the award of any Degree or Diploma or other similar title of this or any other University or examining body.

Aizawl: Mizoram
12th December 2008

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CERTIFICATE

This is to certify that the thesis entitled” Strategic Developmental Plan for Adoption of Information and Communication Technology (ICT) in the College Libraries of Mizoram” submitted by Sanjeev for the award of Doctor of Philosophy in Library& Information Science is carried out under my guidance and incorporate the student’s bonafide research and this has not been submitted for award of any degree in this or any other university or institute of learning.

Aizawl: Mizoram
15th December 2008

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ABBREVIATIONS AND ACRONYM

AACR2	Anglo American Cataloguing Rules, 2 nd Edition
ADINET	Ahmedabad Library Network
AIU	Association of Indian Universities
ANSI	American National Standards Institute
API	Application Programming Interface
BARC	Bhabha Atomic Research Centre
BONET	Bombay Library Network
CG I	Common Gateway Interface
CALIBNET	Calcutta Library Network
CAS	Current Awareness Service
CC	Colon Classification
CCC	Classified Catalog Code
CCF	Common Communication Format
C-DAC	Centre for Development of Advanced Computing
CD-ROM	Compact Disc Read Only Memory
CD-RW	Compact Disk Rewritable
CDS/ISIS	Computerized Documentation Service/Integrated set of Information System
CZC	C.Zakhuma College
DAT	Digital Audio Tape
DBMS	Database Management System
DDC	Dewey decimal classification
DDS	Document Delivery Service
DELNET	Developing Library Network
DESIDOC	Defense Scientific Information and Documentation Centre
DRTC	Documentation Research and Training Centre
DTIC	Defense Technical Information Centre
DVD-ROM	Digital Versatile Disk Read Only Memory

DVD-RW	Digital Versatile Disk Rewritable
EAD	Encoded Archival Description
EDDIS	Electronic Document Delivery, the integrated Solution
E-mail	Electronic Mail
ERM	Electronic Resource Management
ERNET	Education and Research Network
FTP	File Transfer Protocol
GAC	Government Aizawl College
GANC	Government Aizawl North College
GAWC	Government Aizawl West College
GHC	Government Hrangbana College
GHnC	Government Hnahthial College
GHz	Gigahertz
GJBC	Government J.Buana College
GJTC	Government J.Thankima College
GKC	Government Khawzawl College
GKoC	Government Kolasib College
GLC	Government Lawngtlai College
GLuC	Government Lunglei College
GSaC	Government Saitual College
GSC	Government Saiha College
GSeC	Government Serchip College
GTRC	Government T. Romana College
GUI	Graphical User Interface
GZC	Government Zawlnuam College
GZRSC	Government Zirtiri Residential Science College
HDD	Hard Disc Drive
HTML	Hypertext Markup Language
IIT	Indian Institute of Technology
ID	Identification Number
IDAMS	Integrated Data Analysis and Management System

IISN	International Standard Serial Number
ILIS	Integrated Library and Information System
ILL	Inter Library Loan
ILMS	Integrated Library Management System
INFLIBNET	Information and Library Network
INSPEC	Information Science for Physics, Electronics, and Computing
IOLS	Integrated Online Library System
ISBD	International Standards Bibliographic Description
ISBN	International Standard Book Number
ISO	International Organization for Standardization
ISO 2709	ISO (International Organization for Standardization) standard for bibliographic description
IT	Information technology
IUCS	Inter-University Centers
JANET	Joint Academic Network
KC	Kamalanagar College
LAN	Local Area Network
LC	Library of Congress
LCC	Library of Congress Classification Scheme
LCSH	Library of Congress Subject Headings
LibQUAL+	Library Quality
MARC	Machine Readable Cataloguing
MB	Megabyte
MeSH	Medical subject Headings
METS	Metadata Encoding and Transmission Standard
MHz	Megahertz
MIME	Multipurpose Internet Mail Extension
MINISIS	Minicomputer-based Information Management System

MLC	Mizoram Law College
MS-SQL	Microsoft Structured Query Language
MYLIBNET	Mysore Library Network
NACSIS	National Centre for Science Information System
NCIP	National Circulation Interchange Protocol
NIC NET	National Information Centre Network
NISO	National Information Standards Organization
NISSAT	National Information System for Science and Technology
NOTIS	North Western Online Totally Integrated System
OAI	Open Archives Initiative
OAI-PMH	Open Archives Initiative – Protocol for Metadata Harvesting
OCLC	Online Computer Library System
OCR	Optical Character Recognition
OCW	Open Course Ware
OPAC	Online Public Access Catalogue
OpenURL	Open Uniform Resource Locator
OS	Operating System
OSI	Open System Interconnection
PC	Personal Computers
PERL	Practical Extraction and Report Language
PHP	PHP: Hypertext Preprocessor
PLIMS	Pakistan Library Information management System
PUC	Pachhunga University College
PUNENET	Pune Libraries Network
RAM	Random Access Memory
RDBMS	Relational Database Management System
RFI	Request For Information
RFID	Radio Frequency Identification
RLIN	Research Library Information Network

SC	Southern College
SDI	Selective Dissemination of Information
SERVQUAL	Service Quality
SGML	Standard Generalized Markup Language
SIP	Standard Interchange Protocol
SOUL	Software for University Libraries
STM	Scientific Technical Management System
TALIS	Tamkang Automated Library Integrated System
TCP/IP	Transmission Control Protocol/Internet Protocol
TIFR	Tata Institute of Fundamental Research
TLMS	Trans Library management System
TQM	Total Quality Management
UDC	Universal Decimal Classification
UGC	University Grant Commission
UK	United Kingdom
UKMARC	United Kingdom MARC (Machine Readable Cataloguing)
UMI	Universal Micro Graphic Institute
UNESCO	United National Educational Scientific and Cultural Organization
UNICODE	Unique, Universal, and Uniform Character Encoding
UNIMARC	Universal Machine Readable Cataloguing
UPS	Uninterrupted Power Supply
URL	Uniform Resource Locator
USMARC	United States MARC (Machine Readable Cataloging)
UTF	Unicode Transformation Formats
VSNL	Videsh Sanchar Nigam Limited
WAN	Wide Area Network
WHO	World Health Organization
WINISIS	Integrated Sets of Information System for Windows

WORM	Write Once Read Many times
WWW	World Wide Web
XML	Extended Markup Language

CHAPTER- 1

INTRODUCTION

1.1 Introduction

Library occupies an important place in the educational system. Its aim is to educate the illiterate, dispel their ignorance and provide opportunities for continuing education to the educated. Libraries have become an integral part of public education in the economically advanced countries and they are gaining importance in the developed countries. It is an indispensable agency for imparting education to the people and capable of helping neo-literate to learn and continue to learn through life. Libraries also help the educated to continue their education by making available to them full and free use of books after they have left their schools and colleges. (Sharma; 1978; 18).

Libraries also occupy a place of prominence in higher education. These are not only essential for teaching and study but are equally important for research programme without which no further addition to human knowledge is possible. The Education Commission headed by S. Radhakrishnan has laid stress on the importance of libraries in higher education: "The teaching is cooperative enterprise. Teachers must have necessary tools for teaching purpose in the shape of libraries and laboratories as also the right type of students. The library is the heart of all university work; directly as regards its research work, and indirectly as regards its educational work which derives its life from research work. Scientific research needs a library as well as laboratories, while for humanistic research; the library is both library and laboratories in one. Training in higher branches of learning and research is mainly a question of learning how to use the tool, and if the library tools are not there, how can the student learn to use them"(Education Commission of India;1948;110).

Kothari Commission has also emphasized shifting of curriculum and text-book centered teaching to library centered teaching. Evaluating the role of

a modern university, it has stated that the function of a university is to give enduring knowledge of the fundamental principles of a subject which would help them to solve new problems as they arise and to keep on learning throughout life. It states very clearly that “ lecture should be supplemented by tutorial instructions and therefore the student should turn to the library to find for themselves, with the help of reference libraries, the relevant material and knowledge needed”(Education Commission of India;1966;4).

The Mehrotra Committee of the University Grants Commission (1986) prescribed the following vital role of an academic library. The library performs a crucial role in educational process. It expands and supplements curricular learning. It widens the horizon. The library satisfies the quest of learning, spurs it to greater effort. While passing on to the youthful generation the distilled wisdom of the human mind as it has evolved over the ages, the library sharpens the mind and clarifies concepts. It is most durable bridge across time. The importance of the library's role in imparting and disseminating knowledge has, of late, been enhanced by developments in continuing education, distance education and the Open University system. The introduction and expansion of nation wide scheme of these systems is essential for a country which faces huge backlog illiteracy (Srivastava; 1987).

No system of higher education can produce effective results without a strong library at its centre. Educational requirements and methods have greatly changed and broadened. Both, faculty and students are becoming more and more dependent on libraries, and therefore knowledge of their use effectively is not only important but also essential for getting maximum benefit out of the books and recorded materials. Libraries prove useful in the fulfillment of the aspirations and cherished goals of the library users. Training in the higher branches of learning is mainly a question of learning how to use library resources efficiently.

A library plays a pivotal role in ensuring the success of higher degree of research. The important activities of college libraries include the Collection Development, Reference Service, Document Delivery, User Education, and Access to Electronic Resources etc. College libraries are expected to provide cost effective and reliable access to information using the state-of –the art information technology tools.

Information technology has revolutionized the information handling activities in the academic libraries during the past few years. The Information Society demands that all the relevant technologies; that are involved in information processing, consolidation, repackaging and retrieval be merged so as to evolve an integrated system; capable of providing diversified services. In this direction the automation of individual college library is a first step, rather a pre-requisite for the development of such an integrated college library and information system. The promising trend in the development of information services with effective networking of these libraries will facilitate the optimum utilization of information resources.

Today in our country there are 20 Central Universities and 215 State Universities, 100 deemed to be universities, 5 institutions established under State Act and 13 institutes of national importance apart from around 17000 colleges including 1800 women's colleges. This vast academic community needs a wide variety of information services in the changing academic environment (Universities Handbook, 2008).

During the last twenty years, the rapid developments in information and communication technologies have had a profound impact on Higher education in India and abroad. The new technologies have not only changed the way information generated, organized, stored and distributed, but more importantly they have become indispensable tools for teaching, learning and research activities in the country. As a result, the method by which instruction is delivered and research is conducted, is

never going to be the same again. It is an established fact that today in most of the institutions of higher education in the western countries there is and ample use of Intranet and Internet to access the global information. It is regarded more as necessity, and not a luxury. In general, the mission of the academic libraries is to provide effective access to scholarly and professional information resources for its members and other participating library members. Achieving this requires organized use of computing tools in all facets of library activities. Rapid proliferation of information, overgrowth of information resources and multifarious needs of users posed a critical challenge of delivering timely information to the satisfaction of the users. Hence academic libraries do not really have any choice, but to embrace, the available technologies judiciously to meet the expectations of their users.

The developments in the Information Technology sector have proved the death of distance and the death of time. Academic Libraries are fertile areas for the introduction of Information Technology for providing and making accessible the best possible information from anywhere any time and from any sources for the user's community. Network is going to be the essential partner in this exercise as it facilitates access to vast information services. Networks have potential to improve library services in several ways. The continuous improvement in the 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 its end users. In recent years libraries worldwide have been affected by an uncertain financial environment in which resource buying has been restricted, causing them to look at the ways of extending their purchasing capabilities to compensate for reduced budgets. The situation is like 'United we stand, divided we fall'.

With so much of information stored on networks and a desire to share that information, better access tools were developed which took advantage of

enhanced technology. Mosaic, in 1993 was the first information browser released for use with the personal computer. The early developers described the connected network of information resources as the World Wide Web (www). Mosaic was succeeded with new generation browsers now popularly known as Netscape Navigator and Microsoft Internet Explorer. Libraries with Internet connections provide access to these browsers, which are used to search the web for information on the Net.

Advances in Information and Communication Technology (ICT) have necessitated computerization and networking of libraries and information centers in the country to provide effective and efficient services. Today many of the libraries (academic/public/ special) are fully computerized and connected to different networks. These libraries also provide Internet services to the users. Library automation and networking form a strong base to develop digital libraries, which is the need of the hour. This process of automation and networking are also taking place in the academic libraries particularly university and college libraries. In India UGC has taken a number of initiatives through Information and Library Network (INFLIBNET) for computerization and networking of university libraries. Besides, UGC also provides financial support to automate the college libraries so as to offer the effective and efficient library services to the users.

As on date, Mizoram has 1 (One) central University, 1(One) constituent College, 20 (Twenty) Govt. Colleges, 6 (Six) Private Colleges. The names of these colleges are appended in *Annexure - II*. These college libraries need to be computerized and networked so that the resources of all these libraries could be utilized by the participating libraries.

1.2 Statement of the Problem

It is a fact that the present College Libraries in Mizoram urgently need application of Information and Communication Technology (ICT) to

provide fast and reliable library and information services. But a preliminary survey and on-site visit to the libraries of Government Colleges including Pachhunga University College, the constituent college of Mizoram University and Private Colleges by the researcher have brought to the notice several problems of resources such as physical, human and financial faced by these libraries. Besides these College Libraries need modernization (Automation and Networking) which include,

- Planning of Library Automation
- Selection of Hardware and Library Software
- Retro Conversion, and Standardization
- House Keeping Operations
- Website Development and Digital Collections
- Education and Training

Considering all these points stated above and the ground realities, this has prompted the researcher to take up this research problem to propose a strategic developmental plan for College Libraries in Mizoram through adoption of Information Communication Technologies.

1.3 Objectives of the Study

The objectives of the present study are as follows:

1. To present the library scenario in Mizoram particularly the college library scenario.
2. To assess the strength and limitations of these college libraries in terms of infrastructure (physical, financial and human resources).
3. To evaluate information resources available in these libraries.
4. To examine the possibilities of adoption of Information and Communication Technology (ICT) and also to take stock of the existing ICT facilities.

5. To work out a strategic developmental plan for adoption of ICT in college libraries of Mizoram (Automation and Networking).
6. To design an organizational framework for unimpeded and systematic development of College Libraries to suit the growing knowledge society.

1.4 Scope of the Study

The scope of the present study is limited to College Libraries of Mizoram with special emphasis on application and adoption of Information and Communication Technology (ICT) facilities. These Colleges are categorized in two groups (a) One Constituent College of Mizoram University including other Government Colleges and (b) Private Colleges.

Although there are different areas of development of Colleges Libraries but present study is limited to modernization (Automation and Networking) to improve the Library management efficiency as well as services provided. More specifically the proposed study is limited to a strategic developmental Plan for adoption of Information and Communication Technology (ICT) in the College Libraries of Mizoram.

1.5 Review of Literature

A number of studies, projects and publications are available in the areas of application of Information and Communication Technology in libraries and information centers. When discussed about Information and Communication Technology, broadly it includes Hardware and Software for library automation, house keeping operations viz. computerized acquisition, computerized cataloguing, on line public access catalogue, computerized serial control, computerized circulation and other office management activities. This further includes computerized Library and Information services such as Alerting Service, Bibliographic Service, Document Delivery Services and Reference Services. Networking includes network software, categories of networks, library and information

networks and Internet for library and information professionals. A number of literatures are available on these areas of which some of them are listed below.

1.5.1 Information Technology Applications in Libraries

IT has huge potential for providing a wide range of new opportunities as also for offering better solutions to achieve greater levels of efficiency, productivity and higher standards of quality services in libraries. Several people have given varied reasons that contributed to the IT applications in libraries. Library automation is one of the major applications of IT in libraries. It implies a change from the manual system to the application of computers and other modern equipment to library operations and services. During the last decade, IT has played an increasingly influential role in Library management system as they have immense capabilities in handling and processing huge volume of information held in libraries. A large number of studies have investigated the utilization of technological applications in library and information centers all over the world.

Gopinath (1995) observed that the developments in IT have been revolutionizing the library and information services. He stated that the technology is evolving rapidly and is providing additional facilities such as network access, electronic document delivery, information interfacing and modeling facilities etc. IT has to be built on a flexible frame to provide instant, conducive approaches towards identification, location, access, retrieval and usage of the information to satisfy the end users.

Ravichandra Rao (1997) has discussed the status, problems and the future of automation in academic libraries in India. He states that automation activities in academic libraries slowly picked up with the support from INFLIBNET, UGC, NISSAT and other similar agencies combined with increased awareness of IT and its applications among

librarians. They are beginning to use E-mail, CD-ROMs, LAN, machine-readable catalogue, etc., for sharing their resources.

Ansari (1998) reviewed the computerization activities in 14 universities of Bihar and found that had received financial assistance from INFLIBNET for computersation of their libraries. He discussed certain problems such as trained manpower, IT infrastructure, etc. and offered a few suggestions i.e. availability of cost effective library automations software, hardware, training for improvement of computerization process in university libraries of Bihar.

Venkataramana Rao and Chandrasekhar (1998) have stated that effective use of IT libraries increases efficiency in operations, eliminates repetitive nature of works, improves the quality and range of services, facilitates easy and wider access to all kinds of information sources, facilitates faster information communication, increases morale and motivation of library staff, facilitates cooperation and resources sharing saves time, space and resources, improves productivity and image of the library.

Chandran and Ramesh Babu (1999) have conducted an opinion survey to study the attitude of 50 staff members towards use of IT in 16 academic libraries. They have found out that the library staff have good interest in automating library services and expressed greater appreciation for new technology as it can help in providing better services to their patrons. They have also found out that insufficient funds is the major reason for poor state of IT applications in libraries, followed by lack of support by administrative authorities and lack of trained staff.

Rama Reddy (2000) viewed that the emergence of information technologies has created greater opportunities in the libraries in the 21st century. The users' demands are forcing the application of new technologies, new modes of access to knowledge resources and new

techniques of knowledge search etc in the libraries. The professional librarians need to enrich their knowledge with updated information on the pattern and working of different types of library collection and services with utilization of modern IT tools.

Kannappanavar and Vijayakumar (2001) surveyed the use of IT facilities, in- house databases, access to networks, library services and barriers to IT applications in two agricultural university libraries in Karnataka. They found that none of university libraries were having databases and full implementation of IT applications.

Selijak and Seljak (2002) have reported that the COBISS system interconnects over 250 of the largest Slovenian libraries into a uniform Slovenian library information system. COBISS is also used by other independent library systems in some countries in the territory of the former Yugoslavia. The development of the COBISS shared cataloging system and services runs parallel with the second software generation (COBISS2). Authority control and other services were introduced on COBISS2, and the development of interlibrary loan applications, acquisitions, and other services are being implemented on COBISS3.

Convey (2003) revealed that academic libraries are not meeting user's needs and expectations for easy access to online library resources. The survey results indicate that technologies currently deployed to support off-campus users are inadequate and problematic for both users and libraries. A new approach is required to improve service quality. The internet2 Shibboleth software offers a viable alternative. Access to the Internet has precipitated new information seeking behaviors and expectations.

Shinha and Satpathy (2004) explained resource sharing by stating its objectives and need in the areas of science and technology specifically to meet the demand of users in the face of proliferation of information. They

discuss the need for automation and networking of libraries by stating the aims and objectives of library networks, types of networks available in the country including UGC and NISSAT sponsored networks and also some international networks.

Jeng (2005) has discussed to develop and evaluate methods and instruments for assessing the usability of digital libraries. He discusses the dimensions of usability, what methods have been applied in evaluating usability of digital libraries, their applicability, and criteria. It is found in the study that there exists an interlocking relationship among effectiveness, efficiency, and satisfaction. It provides operational criteria for effectiveness efficiency, satisfaction, and learns ability. It discovers users criteria on “ease of use,” “organization of information”, “terminology and labeling,” “visual attractiveness,” and “mistake recovery”. Further, common causes of “users of” & “user lost ness” were found and “Click cost” was examined.

Rosenberg (2006) reported the finding of the survey of the International Network for the Availability of Scientific Publication (INASP) to find out the current state of digitization in university libraries in sub-Saharan Anglophone Africa in 2004. The study reveals that university libraries in Africa have progressed towards establishing digital library services at very different speeds and levels. For the majority of libraries e-resources are available but facilities for access are very poor. The acquisition and implementation of library management system appears to an essential building block in the construction of a digital library. All e-developments depend heavily on external funding and will continue to do so. Lack of funding and lack of or retention of trained staff is the key challenge for the future.

1.5.2 Library Automation-General Aspects

The automation of libraries and information centers in the India started in middle of the 1950s till the concept of automation was centered on the use of computers for housekeeping operations and information services by individual libraries. There are certain factors responsible for the automation of the libraries. Information explosions, increased user's demand, labour intensive nature of work, changing concepts of documents. Application of modern management techniques reduced response time and need for resource sharing are important elements. With the tremendous capabilities of computer, libraries started using computers for the in-house operations.

Gupta (1985) presented trends of development in information technology and describes computer facilities, including the software available in Nigeria. CDS/ISIS is being used in the preliminary stage in the absence of full fledged library automation software. He stresses the need for introducing courses in computer application for educating and training information professionals in Nigeria.

Kaul (1990) discussed the progress of library automation in the European countries. The study provides an overview of networks in the UK with special reference to the British Library's automation programme and key areas of work the Joint Academic Network (JANET), and the CATS on-line cataloguing system, developed by the University of Agricultural Bureau International (CABI) data base highlighting their activities. He lists broad projections stressing the need for automation programmes in Indian libraries.

Harinarayana (1991) described libraries as one of the important components of the modern society. By automating their operations and services, modern libraries are undergoing rapid transition. Librarians are now facing the problem of how to automate. Any automation project can

be viewed through three stages: planning, design and operation. Planning includes the study of the feasibility of the project. Design encompasses the logical as well as physical design of the system. Implementation and evaluation form important steps in the operational stages.

Vishwanathan (1991) reported that many libraries around the world have automated one or more of the following functions: acquisition, serials control, circulation, cataloguing, interlibrary loan. For this automation information technology offers two approaches at the system level, i.e., integrated systems approach and distributed systems approach. In the integrated systems approach, a single system is used to implement automation in all the functions or activities. A distributed system approach permits incremental growth with low initial investment.

Ashford, Hariyadi and Nanny (1992) pointed out that a project has been developed for national academic union catalogue for the 49 universities and major teacher training colleges of Indonesia has complete its design stages, and procurement of software and computing equipment will follow. The operational centre will share a site in Depok with the University of Indonesia and the use of national plan and end user's requirements in library automation as a whole. The use of CD-ROM is proposed as a distribution medium for the union catalogue of at least 500,000 titles.

Lasen (1992) reported that more than 1300 large integrated library systems are installed in the EC (European Community) member countries. This figure represents a growth rate of more than 525% over the last five years. New suppliers have achieved some 36% of the market. The number of suppliers of large integrated systems has increased from 12 in 1986 to more than 30. More than 3600 small integrated systems have been installed by some 40 different suppliers shown in a study carried out in 1991 as background for the Commission of the European Communities (CEC) action under the Libraries Programme.

Bhragava, Srivastava and Murthy (1993) mentioned that a library automation software package (SANJAY) has been developed in the CDS/ISIS V2.3 environment by using extensively the Pascal interface to meet the requirements of a model library. It is an interactive, menu driven, and user-friendly package which carries out routine functions of a library.

Satish Kumar and Kar (1995) described the use of the CDS/ISIS bibliographic database package within the Tata Energy Research Institute Library in Delhi. They indicated the capabilities of the package and state the hardware requirements and package availability (from UNESCO). They have assessed the application of the package through a comprehensive survey of the literature on its use within libraries throughout the world.

Carrigan (1996) reported the results of a questionnaire survey of the chief collection development officers at 108 university library members of the Association of Research Libraries (ARL) to determine the extent to which data produced by computerized methods are used to guide collection development management, as a result of the introduction of OPACS and other library automation methods, is yet to fulfilled. The reasons given range from the lack of suitable software to skepticism about the value of computerized circulation control data for collection development.

Ravindran (1997) viewed that the success of any library or information center lies not only in its own resources, but also in being able to identify and enlist various sources of information that are available elsewhere and in developing the requisite tools and systems needed to tap into those resources. The minimum requirement to ensure such sharing of information is a common format for the maintenance of databases and the required technology inputs, including software packages. An overview of various software products that are available for library automation and the management of bibliographic databases are presented.

Keller and Neubauer (1999) described the academic and political environment, which has significantly influenced the development and character of Swiss university libraries. Swiss higher education, with the exception of the Swiss Federal Institutes of Technology, is organized primarily on a cantonal basis, which is an impediment to the formulation of a unified national library policy. They give an overview of the organization and the responsibilities of Swiss university and other higher education libraries.

Ming (2000) described the development of library automation systems in mainland China. The Project of Chinese Information Process marks the beginning of library automation, and the progress of computer technology and network application which followed it are described in four stages: (i) preparation and experiment (1971-1982); (ii) single function and multifunction systems (1983-1996); (iii) integrated online library systems; and (iv) networking and digitalization (1997 on). The current library automation system of mainland China is mainly developed by commercial software companies, both domestic and foreign: outlines their 5 chief features.

Davarpanah (2001) examined the level of information technology (IT) application in university libraries in Iran. As a background, an attempt was made to present current status of IT application in the libraries. In his study the whole population of 79 university libraries under the jurisdiction of two ministries: Culture and Higher Education (MCHÉ) and Health, Treatment and Medical Education (HTME), was surveyed. The author concludes that the automation of Iranian university libraries is a continuous exercise.

Bregzis, Gotlieb, Moore (2002) reported that in 1962, the Province of Ontario established five new universities and asked the University of Toronto Library (UTL) to help build libraries for them, which it did. They describe that the main task was to determine a record format, coordinated

with that developed later for the Library of Congress's MARC project. Eventually, UTL established the University of Toronto Library Automation Systems. The early decisions have enabled the UTL to develop electronic indexes and a full-text document distribution system at a rate that has kept it among the world's leading libraries.

Seneviratne and Amaraweera (2002) outlined the historical background to the use of computers for library automation in Sri Lanka with special emphasis on the use of CDS/ISIS. They describe the implementation of a prototype low cost World Wide Web based library automation system as a solution to the information management problems in Sri Lankan libraries.

Gaur (2003) has analyzed the present status of digitization of Indian Management Libraries through a survey. Regarding the issues such as library automation, development of digital libraries, he found that 45% of libraries have not yet started automation; out of 55% of libraries that have started library automation, only 16% have been fully computerized. Thus, in Indian libraries the digital gap is widening day by day. The author argues that it is high time management libraries made computerization their number one priority.

Venkataramana Rao and Chandrasekhar (2003) reported that Central University (CU) Libraries in India are currently at various stages of advancement in the use of information technology (IT). They present the results of a research study conducted in order to survey the use of IT in CU libraries. It covers computers and software packages used, computerized library operations,. Development of databases, bibliographic standards used, computerized information services, level of participation in networks and computerized facilities offered to users, etc.

Cholin (2005) stated that IT has revolutionized the information handling activities in research and academic libraries in India. The university libraries, as Centers of information services, have largely benefited by the

rapid changes in the IT. The university libraries in India are at various stages of development in the application of information technology tools in their day-to-day activities. The authors give an overview of Information Technology implementation in different university libraries in India that provides effective access to resources available within universities and elsewhere. He also discusses the role of the INFLIBNET Centre in the overall development of university across the country with special emphasis on efforts through UGC-Info net E-Journals Consortium.

Suku and Pillai (2005) have presented the scenario of automation activities of university libraries in Kerala. The survey findings mainly cover various aspects of library automation such as information technology infrastructure, in-house activities, information services and their usage, manpower development, and budget. Authors discuss the role of INFLIBNET Centre in accelerating the automation activities of university libraries, especially in the context of the recently introduced UGC-Info net programme. The problems encountered in this process are identified and possible suggestions are stated.

1.5.3 Studies on Library House Keeping Operations

The major areas in the housekeeping where computers are being used extensively are- acquisitions, serials control, catalog, circulations, etc. Each system involves a large number of operations and services.

Kumar, P.S.G (1987) has surveyed 37 institutions, covering about 82 computerized programs in operation. 21 out of 37 institutions have computerized only one operation. Six of them have computerized a couple of operations. Nine out of 37 have computerized three to eight library operations. RRC, TIFR and BARC have not only taken the lead in introducing computerization at the earliest, but have also tried to evolve a comprehensive computerized system.

Lin (1998) reviewed the development of computerized library services in the Chinese People's Republic. He has discussed the important role the National Library of China and recent developments in computerized acquisition, cataloguing, circulation control, union Catalogues of periodicals, and on-line cataloguing. He has stressed in his study that education, training and use of standards are the keys to make the resource sharing a success.

Ramesh, L.S.R.C.V. (1998) argued that if libraries are to provide efficient services to enlightened users it is essential that the technical services should be well organized and up-to-date. He discusses the traditional methods of management of technical services departments prior to the introduction of computers and the notes the great changes in the infrastructure of library technical services that have arisen in making them more useful and effective in university libraries through the application of information technology.

Rowley (1993) stated that OPAC supports core sophisticated searching and allows consultation of issued records as well as on-order items. Its features include combined searches using Boolean operators and nested terms, field searches, range searches, relational searches, hyper searches, qualifying searches, group search, storable and reusable search strategies and search results. It also offers powerful sorting capabilities and printing options. Other features include a number of ways of displaying search results, access from remote locations, searches statistics, generation of hardcopy catalogues and creation of catalogue on CD-ROM.

Aruna (1998) stated that an increasing number of libraries now make their catalogues available online through online public access catalogues (OPACs), which can be searched from a terminal within the originating library, from a terminal elsewhere in the organization, or remotely via national or international telecommunications networks. The author

discusses the impact of an OPAC on library automation, different types of OPACs, how to search OPACs in different ways, and the limitations of OPACs. Also the author evaluates the OPAC module of the SUCHIKA software.

Ramesh Babu and Ann O'Brien (2000) reported that web-based online public access catalogues (OPACs) began to appear in the late 1990s and many libraries are currently considering implementation. As catalogues, they demonstrate advances on traditional OPACs especially in terms of remote access by users and their potential to integrate many document types and sources via a single interface. Six popular Web OPAC interfaces which are in use in UK academic libraries (Talis, INNOPAC, WebCat, Voyager, GeoWeb and ALEPH) have been examined with an overview of the functions offered via those interfaces. A checklist has been developed as an indicator of the important features and functions offered.

1.5.4 Services

Libraries are experiencing a significant impact of IT on information processing, sources and services. Rapid technological developments have enabled libraries not only to improve the quality of existing services – but also to offer a wide range of new services to users. An automated library provides the following services – Interlibrary Loan Service (ILL), Document Delivery Service (DDS), Web access, Current Awareness Service (CAS), Selective Dissemination of Information Service (SDI), Listings Service/Notification of new materials, Routing of Journal, Table of Contents Service, Bibliographical Enquiry Service, Library reference service by E-mail, etc.

Libraries use IT to create in-house databases of their holdings. Computerized database provide easy and user-friendly access to the information resources and sound foundation for efficient information

services. One of the fundamental characteristics of computer based information retrieval is that the database at the heart of the system may be used as the basis for a plethora of different products ranging from CD-ROM, through online access on an external host to printed indexes and current awareness bulletins (**Rowley, 1993**).

Porat (2001) emphasized the growing need for libraries to minimize expenses, and says that the reduction in the number of labour-intensive tasks has prompted the ILL unit of the library at the University of Haifa in Israel to undertake a systematic process of automation. The author describes the process and development of this automation and assesses the extent to which it has improved customer services.

Bailey (2004) explored that library and information managers are now under more pressure than ever to deliver cost effective information and services to their clients. Library automation is a vital tool in the push to work smarter and work better. Clear trends are emerging as managers are seeking library software which not only runs the library effectively, but also users Internet technology, interacts with other applications and data, and provides sophisticated intelligence. Library and information managers are also demanding the integration of the library system with other applications.

Sani and Tiamiyu (2005) have evaluated the status of automated information services in selected Nigerian universities through site visits, and questionnaire and interview surveys of the views of administrators, teaching/non-teaching staff, students and researchers. It was found that automated services were one would expect in a modern university, only about 40 per cent were available and utilized. Respondents were marginally satisfied with the services of the computerized accounting system and the MIS-related databases, but were very dissatisfied with the level of automated library services.

Rokade and Rajyalakshmi (2005) described the present condition of information services in agricultural university libraries in Maharashtra, India. The description changes the scenario of information services as well as their needs to develop agriculture, agricultural education, and research. Surveys are conducted on the information services of four agricultural university libraries. The results show the most university libraries provide information services free of cost which will not be affordable in the future due to high cost of Internet, electronic journals, and price of books. Based on this study, the authors conclude that it is essential to develop computerized and digitalized information services through the development of financial and human resources

1.5.5 Administration, Management Information and Maintenance

In today's library environment of decreasing budgets and increasing accountability and demands, library managers are called upon to monitor the functioning of the library regularly to assess the efficiency of library operations in making decisions about changes in the way library functions. A computerized library system provides comprehensive, reliable relevant, up-to-date and specific information useful to the management quickly on various library activities required by the management for taking effective decisions.

Data migration is considered to be the most problematic aspect of the change over of a library management system, especially for libraries switching from a first generation system to a new system. The problem is compounded in developing countries where libraries lack both skilled manpower and financial resources (**Hallmark and Garcia, 1992**).

Skretas (2005) provided a general list of factors that affect and determine the full use of library information management systems (LIMS) by library staff. The factors, which were identified mainly during participation in the implementation of automation projects in Greece, are listed and briefly

analyzed in categories relevant to the system aspect and to the library aspect. A balanced coverage of all factors should guide us towards a full use of an LIMS. Certainly, in the cases where detailed documentation is needed, this approach is not enough, but as a starting-point it might be useful.

1.5.6 Impact of IT on Human Resource

Human resources are the key to the successful use of any technology in a library. The greatest challenge faced in the deployment of IT is the development of skilled human resources. The staff that can support and comply with the computer and network environment is essential for effective IT implement. Positive attitudes and actions of staff involved in IT use are regarded as crucial for the successful implementation of a new system. Information technology has created a sense of urgency and has created new possibilities for librarianship. Librarians, along with traditional and basic knowledge of librarianship are also required to be well equipped with the knowledge of computer applications in libraries.

Klerk and Euster (1989) also found that there were fewer professionals working in technical services because of the changes in the cataloguing process and that, at the same time, automation has caused an increased demand on the public service area, where professional librarians now spend more of their time. This is changing the orientation of the library from a library from a warehouse to a client centered approach.

Dyer, Fossey and Mckee (1993) stated that technology can have a profound effect on job design and the quality of working life. The introduction of an automated library system brings about changes in the working environment, in the nature of the work and job content, in job autonomy and methods of control, in skill requirements, responsibility, and status and career paths and in patterns of relationships, work groups and communication.

Vijaykumar (1995) has conducted a research to study professional attitude towards library computerization in university and special libraries in Andhra Pradesh. He focuses his attention on their changing roles amidst new challenges and opportunities that IT offers.

Aina (2005) discussed the performance appraisal of library staff in the context of the change from manual operation to library automation in academic libraries in Nigeria. The author mentions that opinions on the impact of automation on their performances were obtained through their reactions to some statements using a scale that was provide in the questionnaire. The general belief is that: library staff productivity has been improved, that there has been a change in user's attitudes towards librarians and that the automation of their libraries is of very great significance though there are bound to be trials and tribulations of the start of the automation.

Hoskins (2005) has in a survey investigated the ICT knowledge and skills of subject librarians at the university libraries of KwaZulu-Natal. A study population of 43 subject librarians, in the university libraries of the Universities of Durban-Westville, Natal (Durban and Pietermaritzburg), and Zululand were surveyed by means of a mailed questionnaire. Interpretation of the results have revealed a low of ICT knowledge and skill amongst subject librarians and a general lack of formal training for ICTs amongst the subject librarians.

1.5.7 Trends in Integrated Library Software

The library and information sector is in the midst of an era of rapid change. Developments in technology and the associated social changes are at once presenting new challenges and opening and opening new possibilities. Until recently “automated library systems” meant computerizing traditional library functions such as circulation, cataloguing, the online public catalogue, acquisitions and serials check- in , with the

library's database as the core element. The recent and rapid evolution in the past few years of libraries, ILMS vendors and integrated library systems themselves now presents some interesting challenges. With the growing capabilities of today's technological advances in the use of web, digital components and electronic resources the expectations of the users have also increased.

Chaudhary and Ashoor (1998) provided functional performance data drawn from an analysis of the capabilities and functionality of three major library automation systems - HORIZON, INNOPAC and VTLS. The assessment was based on vendor input as well as on feedback from libraries of different type from different parts of the world. Objective criteria based on a numerical scoring scheme were used to assess system performance in six major functional areas: acquisition, cataloguing, circulation, public access catalogue. Reference and information services and serials control. The functional performance data is expected to be useful for libraries looking for new systems as well as those already computerized and interested in enhancing their present systems. In addition, data on the extent of the utilization of system capabilities by libraries should also be of interest to system vendors.

Cibbarelli (1998) provides a reality check on the level of developments in library automation systems for the period 1993-1998. In reality, library automation software publishers continue to evolve their products to take advantage of emerging technologies, and librarians' expectations are evolving just as quickly. The focus of product development in library automation firms the last five years (1993-98) has been towards developing interfaces: Web based interfaces to the online catalog, Technical Processing, Acquisition, Serials and Cataloging telnet access to the online catalog; graphical user interfaces; and interfaces to other vendors' products. Product migration has been to UNIX, Windows NT and Windows 95 operating systems

Manifold (2000) opined that nothing can guarantee that an automated system selection process will be successful, but adherence to a set of common sense principles can help in securing a successful outcome. The focus of the process has to be on the long term and must take account of the institutional context into which the system will fit. With the shift towards user empowerment, the involvement of users in the selection process is becoming increasingly critical.

Breeding (2002a) considered the possible impact of open source software (OSS) on the library automation industry and OSS' potential to effect radical changes in libraries should it produce an integrated library system (ILS) that earns a level of acceptance on the same order that Apache did in the World Wide Web server market. Like Apache, an open source ILS would have to offer top of-the-line features and performance to gain acceptance over its commercial rivals. The author concludes that Linux and Apache represent a worldwide victory over high-powered commercial opponents in the operating system and web server arenas but such victories of OSS over commercial products in the ILS arena are not to be expected.

Breeding (2002b) presented the results of a survey of the library automated system marketplace in 2001. The responses from 32 vendors are analyzed and the results tabulated to show global system sales by company, system. Number of new and existing contracts, and US and non-US sales; market sector percentages by library type: number of installations by vendor, system and library type: and number of sales to consortia. One major trend was the expansion of the web or OPAC to employ more content components and to expand the library services and options it offers. Other developments included more involvement in wireless and hand-to-hand technologies for library automation and products based on the Open Archives Initiative (OAI).

Matoria and Upadhayay (2002) stated that a number of ready-made library automation software packages are available in the market, but many of them lack Web interfaces, and thus do not provide Web-based library database access (e.g., for the OP AC). Moreover, these commercial packages provide less flexibility to librarians who want to make changes to the existing databases, and also to publish the same on the Web. Thus, the designing of in-house databases in libraries using common relational database tools (RDBMS) such as MS Access, SQL, DB2, etc. as back-end solutions represents an area of deep concern.

Sonker and Jayakanth (2003) stated that to automate library services efficiently and effectively one needs an integrated library automation package. There are several commercial library automation packages now available but the costs of these packages are beyond the reach of most of the libraries especially the school and college libraries. Koha is the first open source library automation package. They have briefly discussed different features related to routine housekeeping operations that are supported by Koha.

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Felstead (2004) has made a survey of the literature on integrated library management systems published between 1999 and 2003, with a bias towards the academic market in the UK and North America. Recent trends in the integrated library management systems such as Interlibrary loan (ILL) modules integrated into the circulation system; E-check in of serials using an "Electronic Packing Slip" (EPS); Computer-integrated telephony for sending reminders and information on reservations to users; RFID (Radio Frequency Identification) technology for stock checking, circulation and security systems; Access to OPACs, including both searching and patron functions, via mobile devices such as wireless PDAs are noted and predictions for their future identified in the literature, are described. The author concludes that the growth of Web services may enable a new approach to the procurement of library management systems.

Pace (2005) presented a buyer's guide to integrated library systems. Based on the response of survey respondents, a cost basis for a system IS categorized generally as follows: number of volumes in the collection; size of the library: number of locations; number of concurrent or simultaneous users; and site license. Contributing factors include annual circulation, library type, and country, as well as a la carte items, such as training, implementation, or customized services tailored for individual contracts.

Murray (2006) stated that the role of the integrated library system is, and always has been, to help manage the effective delivery of library services. This has traditionally been anchored on the management of the catalogue

and physical collection. The core business and service model could be described as 'Acquire - Catalogue - Circulate'. Libraries today present a more holistic information environment; the role of library systems therefore is to make the management and delivery of that environment both effective and efficient. The business and service model is evolving from acquiring, cataloguing and circulating physical collections to synthesizing, specializing and mobilizing Web-based services. The current generation of federated search systems, link revolvers. Resource-sharing systems and electronic record management (ERM) systems have begun to address the new model.

The studies cited in the literature review indicate that considerable work has been done in studying the application of information technology in libraries, library automation, integrated library systems and impact of IT on human resources in general. However, there is a dearth of literature that deals specifically with the study of strategic developmental plan for adoption of Information and Communication Technology (ICT) in the college libraries of Mizoram. The trend is gradually changing. With the advent of personal computers and comprehensive software packages many college libraries are trying to automate as many as areas possible. Increasing importance of library automation, resource sharing and activities of INFLIBNET Centre are providing the much needed impetus for the college libraries. However, the research is still in the formative stage and it needs to be taken further to achieve the very objective of studying the level of ICT used in the college Libraries of Mizoram.

1.6 Methodology

While conducting the research the following methodologies were adopted to collect necessary data pertaining to the topic.

1.6.1 Questionnaire Method

A structured questionnaire for the purpose of the present study was designed to solicit information on present scenario of College Libraries in the area of modernization. The questionnaires were circulated to all the 27 librarians of both Government College including Pachhunga University College and Private College of Mizoram.

1.6.2 Observation Method

Through this method the researcher has made a survey of on-site real situation of college libraries followed by an interaction with college authorities and librarians. The scholar also had personal interactions with the Director, Higher Education and Government of Mizoram to find out the real situation prevailing in the libraries under survey. Altogether, 22 college libraries (*Annexure-III*) were visited by the scholar on site.

1.6.3 Interview Method

Interview method is one of the important methods adopted by the scholar to know the real life situations prevailing among the 27 college libraries under survey. The scholar further interviewed the users of the library who are primarily the students, teachers along with the College Library Authorities.

Besides the researcher made use of the documentary and electronic sources which include:

- (a)** Developmental Plans of Information and Library Network (INFLIBNET) for the development of University and College Libraries. Mention may be made that, INFLIBNET has taken the following initiatives to develop the University and College Libraries. The initiatives primarily concerns to,

- ➔ Promote and implement computerization of operations and services in the libraries and information centers of the country, following a uniform standard.
- ➔ Evolve standards and uniform guidelines in techniques, methods, procedures, computer hardware and software, services and promote their adoption in actual practice by all libraries, in order to facilitate pooling, sharing and exchange of information towards optimal use of resources and facilities
- ➔ Evolve a national network interconnecting various libraries and information centers in the country and to improve capability in information handling and service
- ➔ Provide reliable access to document collection of libraries by creating on-line union catalogue of serials, theses/dissertations, books, monographs and non-book materials (manuscripts, audio-visuals, computer data, multimedia, etc.) in various libraries in India.
- ➔ Provide access to bibliographic information sources with citations, abstracts etc. through indigenously created databases of the Sectoral Information Centers of NISSAT, UGC Information Centers, City Networks and such others and by establishing gateways for on-line accessing of national and international databases held by national and international information networks and Centers respectively
- ➔ Develop new methods and techniques for archival of valuable information available as manuscripts and information documents in different Indian Languages, optimize information resource utilization through shared cataloguing, inter-library loan service,

catalogue production, collection development and thus avoiding duplication in acquisition to the extent possible

- ➔ Encourage co-operation among libraries, documentation Centers and information centers in the country, so that the resources can be pooled for the benefit of helping the weaker resource Centers by stronger ones.
- ➔ Enable the users dispersed all over the country, irrespective of location and distance, to have access to information regarding serials, theses/dissertations, books, monographs and non-book materials by locating the sources wherefrom available and to obtain it through the facilities of INFLIBNET and union catalogue of documents.
- ➔ Create databases of projects, institutions, specialists, etc. for providing on-line information service
- ➔ Train and develop human resources in the field of computerized library operations and networking to establish, manage and sustain INFLIBNET.
- ➔ Facilitate academic communication amongst scientists, engineers, social scientists, academics, faculties, researchers and students through electronic mail, file transfer, computer/audio/video conferencing, etc.
- ➔ Undertake system design and studies in the field of communications, computer networking, information handling and data management.
- ➔ Establish appropriate control and monitoring system for the communication network and organize maintenance.

- ➔ Collaborate with institutions, libraries, information Centers and other organizations in India and abroad in the field relevant to the objectives of the Centre.
 - ➔ Create and promote R&D and other facilities and technical positions for realizing the objectives of the Center and
 - ➔ Generate revenue by providing consultancies and information services.
- (b)** State Government Reports, Plans and Proposals for development of College Libraries. The report submitted by the Government of Mizoram specified for sharing of resources among the College Libraries situated both urban and rural areas so as to facilitate the use of information by the users situated in remote corner. Moreover, the Government also initiated the proposal for accrediting provision of Internet connectivity to every college libraries and other educational institutions.
- (c)** Special initiatives taken by UGC / INFLIBNET, DONER and North East Council. It may be noted here that, the North-East Council (NEC) was established in 1971 by an Act of Parliament as the nodal agency for the economic and social development of the total north-east. The establishment of NEC made a remarkable development in education in the north-east in general and Mizoram in particular. The other objectives of NEC are to develop,
- ◆ Educational program through satellite would reach some of the most interior and inaccessible hilly areas of Tripura, Mizoram and Nagaland through video-conferencing;
 - ◆ Creating hub and a studio each in the three states as stated above;
 - ◆ Installing 31 satellite educational facilities in Mizoram;
 - ◆ Making amenable Mizoram as resource centers;
 - ◆ Availability of reception terminals;

- ◆ Providing EDUSAT services in the State which was launched in 2004.
- ◆ Establishing provision for specialized teachers at the uplink station or the hub and to provide lessons to hundreds of students in the remote centers through satellite signals.

Mention may be made that, Indira Gandhi National Open University (IGNOU) and Indian Space Research Organisation (ISRO) have been jointly working to develop a satellite-based educational network since 1993 in North-East.

1.7 Conspectus

The present research problem is analyzed and interpreted in an organized way based on different approaches including findings, suggestions and conclusion in following seven chapters:

Chapter 1: Introduction

The first chapter is discussed about the introduction of the present problem, objectives, scope, review of related literature and research methods which were adopted to clarify the research work.

Chapter 2: Library Scenario in Mizoram

The second chapter dealt with library scenario of Mizoram. It also includes types of libraries in Mizoram and its development.

Chapter 3: College Library Scenario in Mizoram

College libraries scenario of Mizoram has been explained in Chapter- 3 which reflects the functioning and services rendered by the college libraries.

Chapter 4: Adoption of ICT in College Libraries Mizoram

The chapter is discussed about the adoption of ICT in College Libraries by giving idea to build up information and communication infrastructure and is linked with library information networks in India. It also discusses about various aspects of ICT which can be implemented in libraries. The preparedness of the college libraries and factors required for integrated college library system has been studied.

Chapter 5: Impact of ICT on College Library and Information Services.

Impact of ICT on College Library Services has been explained in this chapter by narrating various effects on library services been observed by effective use of ICT in college libraries.

Chapter 6: Data Analysis and Findings

The sixth chapter dealt with analysis, tabulation and interpretation of the collected data through the structured questionnaire. The data in respect of general information, availability of ICT infrastructure in the College Libraries has been covered under study. Application of ICT tools, data relating to various factors responsible for ICT introduction in the college libraries, the college library services based on automated functions, external sources and internet based sources etc.

Chapter 7: Suggestions and Conclusion

Suggestions and summary of findings with conclusions followed by bibliography and appendixes have been discussed in Chapter-7.

1.8 Conclusion

Library services are changing very fast. The old concept of library as a store house of knowledge are giving way to concepts based on development of 'Intermediary' roles in hybrid environment in which the

resources are either traditional or in electronic formats. Librarians need to be very clear about the purposes that their libraries serve, and will need to re-design the range of services they offer with those purposes in mind. Libraries exist to serve their users, but the user population is increasingly heterogeneous. In seeking to provide appropriate services, it is essential that needs of all the different users are taken into account and that the library plays its part, by providing opportunities for the development of information skills, in enabling all users to make the most of their interactions with information resources.

All academic libraries virtually depend on the IT systems for their basic operations such as acquisitions, cataloguing, circulation, serials control etc. The development of IT based systems by organizations with which the libraries deal and within the institution it has meant that much closer attention has to be paid to the integration of the library's system with others. The functions that are required to provide effective delivery of information requirements need to be integrated. The integrated college library and information system can provide one-stop information services using the state of the art information technology tools. The system designed to serve as integrated college library and information system is expected to cover all the aspects required so that the integrated system can support technologies such as Internet, electronic publications etc to provide integrated services. The vast information sources which the library gives access to are not only the item held by or owned by the library but also given access to remote information sources and handling the resultant requirements to authenticate and authorize users. These are the key challenges for the modern academic librarian (Wendi, Arant, 2001).

In the context of new millennium, a university's position should be advanced as a leader among the colleges and universities in using the information technology and library services in providing an enriched

learning environment. There is a desperate need for a college to make information technology and library services a pervasive and transparent part of the lives of students, faculty and staff. The information resources are pervasive when they are available to every one. Those resources are transparent when information, applications and services are available without any delay or limitation of hardware/software etc. Users must experience information resources as seamlessly integrated into their activities. An integrated college library and information system can provide pervasive access to information resources; to have a greater return with the use of computer and communication tools to return meaningful results for the benefit or research and academic community. A detailed scenario of libraries in Mizoram is discussed in the following Chapter-2 entitled “Library Scenario in Mizoram”

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CHAPTER- 2

LIBRARY SCENARIO IN MIZORAM

2.1 Introduction

International Organization for standardization has defined library as “irrespective of the title, any organized collection of printed books and periodicals or of any other graphic or audio- visual materials, and the services of a staff to provide and facilitate the use of such materials as are required to meet the informational, research, educational or recreational needs of its users.

ALA glossary of library and information science has defined library as a collection of materials organized to provide physical, bibliographic, and intellectual access to a target group, with a staff that is trained to provide services and programs related to information needs of the target groups (Young; 1983; 130).

According to Ranganathan, a library is a public institution or establishment charged with the care of a collection of books, the duty of making them accessible to those who require the use of them and the task of converting every person in its neighbourhood into a habitual library visitor and reader of books .The story of civilization indicates that libraries have been an essential part of civilized society. These came into being to serve the needs of the society. Their form, character, purpose functions and services have been determined by the needs of the society served by it. The libraries have played an important role in the social, political, economic and cultural development of the society. These had a significant role in the preservation and advancement of culture; formal and self education; and leisure. In recent years, these have provided reading material and other documents to handicapped readers to alleviate their miseries; assisted disadvantaged members of society to gain rightful place in society; helped businessmen to improve their business; assisted decision makers, researchers, students and other members of society in achieving their goals. With the passage of time, communication of

knowledge has become increasingly important. The knowledge has become increasingly complex and at the same time means of communication of knowledge are also becoming equally complex. A library is concerned with communication of knowledge and it has helped in communication knowledge by providing repackaged information through user friendly devices. This aspect of service is gaining added importance. A library is bound to play greater role in this context as knowledge tends to become more complex and means of communication of knowledge also attend greater complexity.

2.2 LIBRARY AND INFORMATION SERVICES IN MIZORAM

The libraries are no longer considered as merely a store house of documents, they actively participate in the process of transmission of information from the source to the user, thus services provided by a library are referred to as library and information services combining the conventional library functions with its information service role.

In Mizoram, library and information services are provided by the public, academic and special libraries.

2.2.1 Public Libraries

A public library serves the public. A public library is expected to perform the functions of providing for recreation, information, inspiration and education. It serves the local community and is open to public without distinction. Obviously the clientele to be served would cover wide spectrum. It may include students, teachers, research scholar, businessmen, professionals, housewives, retired persons, neo-literates, etc. Their educational attainments and cultural backgrounds will vary a great deal. Public libraries are, "Those which serve the population of a community or region free of charge or for nominal fee; they may serve the general public or special categories of users such as children, members of armed forces, hospital patients ,prisoners, workers, and employees.

The concept of a modern public library originated in Europe in the mid-nineteenth century, more so in the Anglo-Saxon countries and later it spread to other parts of the world. The concept reached India during the British Rule (1762-1947) and was implemented.

The Mizoram Scenario

Before 1989 Public libraries were under, the supervision and administration of Education Department. After 1989 it came under the Directorate of Art and Culture till today. During the Assam Government, the first Public Library in Mizoram was established in Aizawl under the name of Sub-Divisional Library which has now elected to the category of District Library.

The State library came into existence in the year of 1974. It was headed by the state Librarian, there are 5 (five) District Libraries in Mizoram. The State Library have 2 (two) professional staff with other 10 (ten) supporting staff and District Libraries has only 1 (one) profession staff with other 5 (five) supporting staff each.

Besides the above three tier types of Public Libraries, there are 415 recognized villages libraries, which are mostly run by the largest NGO in the state, Young Mizo Association (YMA).

The main source of Public libraries in Mizoram is the State Government. Besides the state government budget allocation, it also received matching grant and central assistance from Raja Rammohan Roy Library Foundation, Ministry of Culture, Government of India Mizoram Public Library services is limited only to lending and consultation of reading materials within the reading rooms, it also recognized training and seminar in collaboration with the Mizoram Library Association and Raja Rammohan Roy Library Foundation. The Mizoram Public Libraries Bill was passed in the State Legislative Assembly in 1993 but is not yet implemented.

The development of Mizoram started with the contributions of the Christian Missionaries of England. Education was started by the two Christian Missionaries, Rev. James Herbert Lorrain (Pu Buanga) and Dr. Frederick W. Savidge (Sap Upa) who traveled from London and arrived in Mizoram on 11th January 1894 under Arthington Aborigines Mission. Their first important contribution for the people of Mizoram was preparation of Alphabets. They started a small school to provide primary education to those who could attend. (Lloyd; n.d.; 34). Due to their tremendous contributions and works, the Assam Government handed over school administration and inspection in Mizoram to the Christian Missionaries from 1904 to 1952. (Lianzawna; 1996; 15). It was followed by the development of college education and the first college in Mizoram established under the initiatives of the Missionaries in 1958 at Aizawl under the name of Aijal College (now, known as Pachhunga University College). Afterwards, the first public library, known as Aijal District Library, was established in 1969 at Aizawl (Lianzama; 1993). Public Libraries are under the direction, supervision and control of education department till the department was trifurcated in 1988. Following the trifurcation of Education Department into School Education, Higher & Technical Education and Art & Culture department, public Libraries were fallen under Art & Culture; academic libraries were under the Higher & Technical Education and school libraries under School Education department.

Public library in Mizoram can be categorized into four groups, such as:

- Government Libraries;
- Government recognized libraries;
- Libraries run by voluntary organizations; and
- Private Libraries

The so-called State and District Libraries falls under the category of Government Library. At present, there is one State Library at Aizawl the state capital, and five District Libraries, one each at the district

headquarters of Aizawl, Lunglei, Saiha , Kolasib and Champhai districts. The facilities, infrastructure, collection, administration, etc. are born by the state government. Library staffs are also government employees and recruited by the state government authority as per rules. The Second categories are those libraries run by NGO or other organizations to cater the local information needs. The State Library Planning Committee recognizes these libraries. They are receiving some grants or assistance from the government and RRRLF schemes. There are 424 libraries under this category mostly in villages. The third categories are those libraries run by different NGOs or voluntary organizations. The local people establish them voluntarily to meet the local information needs. Management and financial contributions are borne by the local people on voluntary basis. The fourth categories are some private libraries established by some academicians or social workers. They were mostly housed in their private buildings and managed by their own resources. These libraries have good collections of cultural heritage. Many of their collections are mostly out of print materials.

2.2.2 State Library

The State Library of Mizoram, an apex public library of the state, was established in 1947 at the state capital, Aizawl to cater information needs of the community. It was housed in rented building since its inception till today. The functions, services, and other activities under taken by state library are given below.

1) Staff

Library staff is one of the trinity of library. There are 14(Fourteen) staff in the state library. Out of fourteen staff, only two staff has professional degree in library science. The state Librarian acted as Controlling Officer of State library.

2) Library Hours

State Library is open five days in a week, i.e. Monday to Friday. Library hours are predetermined by the office timings of the state government. In summer, it opens from 9:00 a.m. to 5:00 p.m. and in winter, from 9:30 a.m. to 4:00 p.m.

3) Membership

Membership is divided into two categories, namely Adults and Children. Any body, who is interested, can become a member of the State Library by filling up of Membership Card and depositing a membership Fee of Rs.10.00 in the case of Adults and Rs.5.00 for Children. Till date, there are 3539 adult and 3192 children members of the State Library. The average daily library user is between 40-50.

4) Sections

The State Library functions comprising various sections in which some staff manages every section. The functions of different sections are mentioned as below;

i) Acquisition Section

The acquisition section takes care of book selection, procurement of books, placing orders, physical checking of books, stamping, accessioning of books, verification of Bills and processing the same for payment.

ii) Technical Section

Technical works, such as Classification and Cataloguing of Books, Identifications of Subject Headings and transcribing are the main works done in this section. Books are classified according to the nineteenth edition of Dewey Decimal Classification (DDC-19th ed.) and follows Anglo-American Cataloguing Rules II (AACR-II) and Sears' List of Subject Heading (SLSH) to assign subject of documents. Among the different

Book Numbering schemes, it follows the 'first three letters of the author's surname' as book number.

iii) Circulation Section

Registration of membership, collection of membership fees, deposits, charging and discharging, reservation of books, recall of books, stack verification, display of new collections, collection of overdue charges are the main functions of this section.

iv) Periodical Section

As its name indicates, all related works on periodicals are taken care here. Selection and ordering of periodicals, receiving and registering of periodicals, payment of bills, display, and reminders are the major functions of this section.

v) Reference Section

This section looks after all the reference books. Staff helps the users to locate their information needs and shelve used Reference Books on the respective racks. Temporary permission is given to the users to take the Reference Books for reprography/photocopying.

vi) Children Section

It takes care of the users, as most of them are children. Care of books; maintain discipline in the library and other related instructions are given to the children. Separate registration as well as Issue and return of children's' books are done here.

5) Collection

The total collection has grown up to 60009. Most of the collections are English and Mizo. The library has been subscribing eight local, six regional and two foreign journals. Three national and eleven local newspapers are also being subscribed. The library also has collected as much as 100 back volumes on different subject.

6) Services

The Mizoram State Library was established to cater information needs of the community in their day-to-day activities and develop the people in their social, economic, cultural and educational aspects. The library provides the following services not only to the readers but also to the general public as well.

i) Circulation Service

The Library is following Browne Issue System for the charging and discharging. Library member can be issued one book at a time for seven days. A fine is imposed as per rules after due date per day. The registered member can borrow one book for a period of seven days. Average issue of books per day is 18. An average of 50 users per day makes use of this system.

ii) Audio- Visual Service

State Library is organizing some Audio-Visual programmes on special occasions. This programme is particularly meant for the children to provide good moral inculcate reading habits and make use of their leisure time in a productive way. Children's films and special films on animals, nature, festivals etc. are shown to the

iii) Book Exhibition

In collaboration with some publishers and the Government, the library organizes Book Exhibitions occasionally. Book Exhibitions were held in Aizawl and Lunglei on different occasions.

iv) Reprography

Reprographic service is being provided since two years back only. This is mainly for the library users. Re.1.00 is charged per page. Library users are very much beneficial this service as they can get their desired materials on the spot by paying a nominal rate.

v) Library Awareness

The State Library in its extension services organized Library Awareness Programs at various district capitals during 2007 as below:

- Serchhip on 16 March 2007
- Kolasib on 20 April 2007
- Champhai on 27 July 2007
- Lunglei on 24 August 2007, and
- Aizawl on 15 November 2007

These programs are organized to give awareness about the library services for the local community to help them in their understanding about the activities and best practices in utilizing the various information provided by the libraries and to encourage the community to make use of library services. The programme was attended by different section of the local community like students, social workers, service personals, pensioners, etc.

vi) Current Awareness Service

Current Awareness Service is being provided to serve latest information to the users. Documentation Bulletin, Content-by-Journal and Newspaper Clipping are the services rendered under CAS.

7) Building

Mizoram State Library, since its inception, is running in a rented building. Now it was housed in a three floor rented building with a separate hired building for Reading Room. The total floor area is 772.72 sq.m. The construction work of State Library Building is under progress at the New Capital Complex, Khatla, Aizawl with the financial assistance from Raja Rammohun Roy Library Foundation.

8) Budget Finance

The source of finance for the establishment, management and development of State Library can be summarized as below:

- Membership registration fee
- Late fine
- Sale of waste papers
- Reprographic charges

Assistance form Raja Rammohun Roy Library Foundation under Matching and Non-Matching Schemes.

9) Library Automation

The State Library is at the initial stage of Library Automation. Necessary infrastructures such as Computers, Software etc, are now in the process of collection. The library has already procured 6(six) Computers to carry out the different works in the library. Internet access through broadband has also been initiated in the library. At present, the Internet is being used for E-mail and Web Browsing. The users are getting a wide range of facilities for accessing information through Internet. .

2.2.3 District Libraries

The growth and development of Mizoram in different aspects gave birth to the establishment of public libraries within the state. The Government of Mizoram established two District Library, one each in Lunglei and Saiha and three Sub-Divisional Libraries, one each in Aizawl, Kolasib and Champhai before 1985. But, after the formation of five more districts in Mizoram, the existing Sub-Divisional libraries were upgraded to the status of District Library and henceforth, there are five District libraries in Mizoram since 2001. Therefore, at present, there existed eight District Libraries in Mizoram, one each in Aizawl, Kolasib, Champhai, Lunglei and Saiha automatically. Mamit District having an area of 3025 Sq.Km with 62785 populations, Serchhip District having a population of 1421 Sq.Km. with 53861 populations and Lawngtlai District having 2557Sq.Km. area with 73620 populations are not having District Library at present. State

Librarian is the Controlling Officer of the district libraries. Each of these libraries may be discussed as below in brief.

1) Aizawl District Library

Aizawl District (Mizoram Statistical Handbook 2006) has an area of 3756 Sq.Km. with 325676 populations in 2001 census. Aizawl District Library is the first public library established in Mizoram. It came into existence on 12 February 1968 at Aijal, now Aizawl, under the control and supervision of Director of Public Instruction for Government of Assam. It was temporarily attached to the office of the Inspector of Schools, Aijal. By that time, District Library was already established in Silchar and consequently it was changed into Sub-Divisional Library on 1 August 1969 and housed in a rented building till today. Later, Mizoram being one of the states of India and consequent upon the formation of Districts in Mizoram and Aizawl as one of them, Aizawl Sub. Divisional Library was upgraded to the status of District Library in 2001.

i) Staff

The State Government of Assam appointed some of the staff for Aijal District Library to function under the Education department.

ii) Membership

Membership is divided into two categories, namely Adults and Children. Any body, who are interested, can become a member of the Library by filling up of Membership Card and depositing a membership Fee of Rs.10.00 in the case of Adults and Rs.5.00 for Children. Till date, there are 3117 adult and 595 children members at the Aizawl District Library.

iii) Collection

The library is steadily growing in terms of collection. Now, it has 29655 collections of books. The average yearly collection of books can be calculated as much as 780. Eleven Indian Journals are being subscribed

and three national and twelve local newspapers are also being subscribed. The library has no back volumes and foreign journals or newspapers.

iv) Technical Work

To classify the documents, library is following 19th edition of Dewey Decimal Classification Scheme (DDC) and Anglo-American Cataloguing Rules-II. AACR-II and Sear's List of Subject Headings (SLSH) are used for cataloguing of books and assigning subject to the documents respectively. Among the different Book Numbering schemes, it follows the "first three letters of the author' surname' as book number.

v) Services

The library has a Circulation Section, Reference Section, Periodical section and Children's' Section. One book can be issued to the library members for a period of seven days at a time. Overdue charge of Re.1.00 per day per book is imposed if not return on due date.

vi) Building

Aizawl District Library, the pioneer public library in Mizoram is not yet having its own building and housed in a rented building. Rented buildings are not functional for a library and as such the staff as well as the users faced difficulties in many ways. However, existing rented library building is of two floors having a total area of approximately 850sq.ft.

2) Lunglei District Library

Mizoram was given the status of Union Territory in 1972 and was divided into three districts, namely, Aizawl, Lunglei and Saiha. Lunglei District (Mizoram Statistical Handbook 2006) has an area of 4536 Sq,Km. with 137223 population in 2001 census and now became the largest districts of Mizar am in area. Lunglei is the district capital. Lunglei District Library was established on 22nd May 1975 by the education department right

after the establishment of State Library at Aizawl. It was housed in a rented building for more than twenty years, but now settled in Saikuti Hall, maintained by the State Government of a storied building at the heart of the town.

i) Staff

From the very beginning, it is under staffed to function as an information center to the community. Three Librarians are being appointed to this library and they are, Mr Hranghrima (1975-1998), Ms. Lallaisangzuali (1998-2005), and Mr. Rotluanga (2005 to present time). Out of the six posts created to this library, only four staff performed their daily duty.

ii) Membership

Before 1999, there was no proper registration for the membership. Anyone who was interested to borrow books from the library can borrow the library books by depositing the prize value. But, since 2000, it follows the registration system of State that any person who is interested can apply and register as a member of the library by filling up the Membership Card and depositing a membership Fee of Rs.10.00 in the case of Adults and Rs.5.00 for Children. By this date, there are 445 adult and 78 children members at the Lunglei District Library.

iii) Collection

The library is steadily growing in terms of collection. Due to lack of finance in the budget for procurement of books, the library is very slow in collection development. Till date the library has 18561 collections of books, which is 516 books per year. Library also gets certain amount of books from the RRRLF against the matching fund. The library has been subscribing eleven Indian Journals and three national and seventeen local newspapers. The library has no back volumes or foreign journals.

iv) Technical Work

Due to non-availability of professional staff, the organization of the library was very inappropriate to serve its clients. Accessioning of books was started in 1983, after eight years of its inception. 19th edition of Dewey Decimal Classification Scheme (DDC 1900.) and Anglo-American Cataloguing Rules-II (AACR-II) are used to assign classification number and cataloguing respectively. Sears' List of Subject Heading (SLSH) is followed to assign subject headings of documents. The 'first three letters of the author's surname' is considered to assign book number.

v) Services

The service rendered by this library is very nominal. The library have Circulation Section, Reference Section, Periodical section and Children's' Section. Circulation and periodical section are the main service rendered by this library having an average of 12 daily issues per day and an average of 30 library users per day respectively. One book can be issued to the library members for a period of seven days at a time. Overdue charges is collected if kept beyond due date at the rate of Re.1.00 per day.

vi) Building

Lunglei District Library is in a rented building for more than twenty years. Now it is housed in the third floor of Saikuti Hall situated at the heart of the town. The floor area of the library is 1500sq.ft. The building is quite good and functional to serve the purpose, but being in the third floor, it is not very convenient for such public center being not easily accessible to the users.

3) Saiha District Library

Saiha District (Mizoram Statistical Handbook 2006) has an area of 1399 Sq.km. with 61056 population in 2001 census. Saiha is the district capital of Saiha District. It is within the area of Mara Autonomous District Council.

Saiha district is in the southern most part of the state and the people of this area are poor and mostly live in villages. To serve the people of the area through library services, a District Library was established in Saiha on 1 st. May 1975 and was known as Saiha District Library.

i) Staff

One of the trinity of a library is staff the library staff should be well trained, professional and large enough to serve the users by providing best information in a systematic manner. Saiha District Library is not well equipped with adequate professional staff but perform their duty to serve the best to its clients.

ii) Membership

Any persons who are inserted to become a member of this library can enroll themselves by paying a registration of Rs.20.00. There is no separate membership fee for adults or children. The library does not have proper record of library members. The average daily users of the library are 55.

iii) Collection

The library is steadily growing in terms of collection. Collection is carried out from budgets and the library also received some books through State Library Committee under the RRRLF Matching Scheme. The present collection has gone up to 13575. The average yearly collection of books can be 411. The library has been subscribing two Indian Journals, one national and nine local newspapers. The library has no back volumes of periodicals and foreign journals or newspapers subscribed.

iv) Technical Work

Due to non-availability of professional staff, the library cannot perform technical processing work systematically. At the same time, accessioning

was done nicely and books were classified according to 19th edition of Dewey Decimal Classification Scheme (DDC 19th ed.) and were assigned 'first three letters of the author' surname' as book number. Documents were not catalogued and assignment of subject heading was out of question.

v) Services

The library has Circulation section, Reference section and Periodical sections. One book can be issued to the library members for a period of seven days at a time. Daily average issue of books is 31. Overdue charges are collected if kept beyond due date at the rate of Re.1.00 per day. The services rendered by this library are very informative to the local community being they are in a remote area.

vi) Building

Saiha District Library has its own building at the heart of the town. The floor area of the library building is 640sq.m. It has stack area and reading room area separately, but they are not sufficient and functional to accommodate the library users comfortably for a long time.

4) Kolasib District Library

Kolasib District (Mizoram Statistical Handbook 2006) has an area of 1382 Sq.km. with 65960 populations in 2001 census. Kolasib District Library was established in 1980 as a Sub-divisional Library but consequent upon the formation of Kolasib District in 1998, and it was elevated to the status of a District Library in 2001.

i) Staff

The present library staffs of Kolasib District Library are five in number. It has only professional staff and other supporting staffs are limited in the field of library services.

ii) Membership

Any persons who are interested can enroll themselves for the member of the library. Membership is divided into two, namely Adults and Children. Membership registration fee is for Rs. 5.00 only. At present, there are 1055 adult and 243 children members at the Kolasib District Library.

iii) Collection

The library is steadily growing in terms of collection. Besides the procurement of books from the allocated fund of the state government, it receives some books from RRRLF Matching Schemes through the State Library Committee. Till date, the collection of books, as per accession register, reaches 15768. The average collection of books can be calculated as much as 985 per year. Two national and seven local newspapers are being subscribed but no journals are subscribed at present. The library has no back volumes of periodicals and no foreign journals or newspapers are on subscription list.

iv) Technical Work

Books are accessioned in the Accession Register systematically and some books are also classified according to 19th edition of Dewey Decimal Classification Scheme (DDC 19th ed.), but are not catalogued. The "first three letters of the author's surname" is taken for the assignment of book number. No other technical works are carried out, but is going to start very soon under the initiatives of the newly recruited Librarian.

v) Services

The library have Circulation Section, Reference Section, Periodical section and Children's' Section. One book can be issued to the library members for a period of seven days at a time. Overdue charges is collected if kept beyond due date at the rate of Re.1.00 per day. The average daily issue of books is 20 and the average daily visitor is 20.

vi) Building

Kolasib District Library is in a rented building since its inception. Under the initiatives of the state government, a new building is constructed at the heart of the town and is in the final stage of its construction. The present rented library building has a floor area of 96sq.m. Being in a rented building, it was not functional to provide systematic services to the users.

5) Champhai District library

Champhai District (Mizoram Statistical Handbook 2006) has an area of 3185 Sq,Km. with 108392 population in 2001 census. Champhai District was being formed in 1998 separating from the Aizawl district. Champhai is the district capital and occupies the eastern part of the State bordering Myanmar on the east and Manipur on the north. The library was established in 1982 under the name of Sub divisional Library but consequent upon the formation of Champhai District, it was upgraded to the status of District Library in 2001

i) Staff

Champhai District Library has only one professional staff supported by other three staffs having less knowledge in the field of library services and systems.

ii) Membership

Membership is open to those who like to register as a member of the library. Membership fee is fixed at Rs.10.00 only per head with a refundable deposit of Rs.100.00 and Rs.50.00 for adults and children respectively. There are two categories of members, namely, adults and children. The registered member of adults has gone up to 1056 and 47 in the case of children till date

iii) Collection

Due to the inadequate resources of finance, the library cannot fast in collection development. At present, the collection has gone up to 14831. The average yearly collection of books is 1060. The library, besides its own collection, receives some informative and useful documents from RRRLF Matching Schemes through the State Library Committee. It has been subscribing six Indian Journals, three national eleven local newspapers. The library has no back volumes of periodicals. During the last four years, 4,115 documents were added to this library.

iv) Technical Work

Champhai District Library follows 21st edition of Dewey Decimal Classification Scheme (DDC 21st ed.) to assign class numbers and Anglo-American Cataloguing Rules-II (AACR-II) for cataloguing of books and Sears' List of Subject Heading (SLSH) to assign subject heading of documents. Among the different Book Numbering schemes, it follows the "first three letters of the author' surname' to book number.

v) Services

The library has Circulation Section, Reference Section, Periodical section and Section. Average daily issue of books is 25 and the average daily visitor is 20. One book can be issued to the library members for a period of seven days at a time. Overdue charges is collected if kept beyond due date at the rate of Re.1.00 per day. The library stack is divided into two; one is open access and the other is closed access. General books are on open access whereas reference books are kept in a closed access. The library organized user orientation programme to aware the rendered by the library and to give better information to the community as a whole. Its reference service is much used by the locality and the students in the college.

vi) Building

Champhai District Library functions in a rented building since its inception till date. It was housed in a first floor cement concrete building at Champhai Vengthlang area. The floor area of the rented building was 180.8sq.m. The building is well ventilated and has good lighting system with natural light for the readers.

vii) Library Hours

Five district libraries of Mizoram are under the control, supervise and direction of the Department of Art & Culture, Government of Mizoram. And as such, they do not have a separate library hours for their respective libraries, but are predetermined by the state government timing for its employees. Therefore, five-district libraries are open five days in a week, i.e. Monday to Friday, but closed on Saturday, Sunday and on public holidays. In summer, it was open from 9:00 a.m. to 5:00 p.m. and in winter, from 9:30 a.m. to 4:00 p.m.

viii) Library Finance

The main source of finance to the five district libraries is State Government. The libraries are not allocated separate annual budget from the State Government but share the budget allocated for the district libraries. The 11th Finance Commission had given grants Rs. 2.6 crore which was fully utilized for up gradation of public libraries. Rs.209.90 lakhs was used for creating Corpus fund and the interest accrued out of the fund are being utilized for purchase of books, periodicals, furniture, etc. for the development of public libraries in Mizoram every year. The 12th Finance Commission has also allotted grants to the tune of Rs. 50.00 lakhs to be utilized annually @ Rs. 10.00 lakhs for development of public libraries. (Boichhingpuii, 2007). The functions, services and management of the above five district libraries are to the mark of the

library standards and norms provided for the public libraries. They have common hindrances and come forward with their problems as below:

- Lack of professional manpower as well as other supporting staff.
- Inadequate finance
- Lack of physical facilities
- Inadequate equipment
- Non functional library building

2.2.4 Village Libraries

In Mizoram (Census of India 2001), there are 22 Towns, 707 inhabited villages and 110 uninhabited villages. The State Library Committee of Mizoram, since 1982 to till date, has recognized as much as 424 village/local libraries run by NGO's and other societies/organizations within the state. Out of the 729 towns/villages in Mizoram, only 424 libraries were recognized whereas 305 do not have recognized libraries. Many villagers are in a line for the recognition of their libraries waiting their turn. The recognized libraries, on the basis of State Government's contribution under matching scheme, received certain amount of assistance through State Library

The rural library is a good component of Public Library system and this has been coined as "People's University" and "Arsenals of Democracy" (Sharma; 2007; 25). Almost 80 Percent of the total population of our country lives in villages. Government sponsored libraries cannot reach each of the villages. Voluntary efforts therefore were made for the establishment of libraries by the youths; most of them are students with the help of book lovers of the locality. These libraries are managed and run by young students and other service holders of the village. The houses are built in public places with people's donations. The books, furniture needed for the purpose are collected locally. The libraries of such kind are opened for some hours of a day or on some holidays in

each week to cater to the needs of the villagers to some extent. Thus these libraries help both literates and illiterates. Most of the rural people cannot think of purchasing the costly books, say, classics and other scriptures, which are borrowed from such libraries. Some one reads these books aloud which helped the illiterates for sharing the benefits of reading. Thus it indirectly serves the Adult Education Programme in a limited way. (Sharma; 2007; 31). A village library has an important role to play in the national programmes of social reconstruction and nation building. It can contribute in sustaining the quality of life of the rural people in all aspects such as educational, economic, industrial, scientific and cultural etc. and they can promote the concept of a democratic society. Adult education centers can be established in the rural libraries for imparting education to the adults. The most appropriate place for serving to the peoples of different ages of the community is the public library. It is for that reason Melvil Dewey stated public library as 'Peoples University'. It means a place where people of all ages can freely acquire knowledge.

2.2.5 Mizoram Public Libraries Act, 1993

Mizoram Public Libraries Act, 1993 was not implemented after fourteen years of its enactment, important features of the Act may be stated as below; Preamble of this Act clearly stated its objectives as, "An Act to provide for the establishment, maintenance and development of comprehensive public libraries system in the State of Mizoram".

Chapter I is dealt about

- ▶ The title of the Act, which is to be extended to the whole of Mizoram on such date as the Government notify in the official Gazette of the State.
- ▶ Definition of different terms that appear in the Act.

Chapter II spells about

- ▶ the constitution of State Library Council, Minister and Secretary of Education & Human Resources Development as Chairman and Secretary respectively, and ex-officio members and other members with term of office.
- ▶ The Council is to advise the Government on all matters relating to Libraries and in regards to promotion and development of library services in the State.
- ▶ The Council is to take suitable steps to establish and promote a Public Library System in the State.

Chapter III is dealt about the constitution of Department of Public Libraries which proposed:

- ▶ Directorate of Public Libraries with Director as its head and other supporting staff, like Joint Director, Deputy Director and other.
- ▶ Appointment of staff on accordance with the provisions of the rules made under this Act.
- ▶ Absorption of existing library staff under this Act.

Chapter IV is discussed about the establishment of different categories of public libraries as:

- ▶ State Library; District Library; Sub-divisional Library and Village Library with their locations.
- ▶ Different sections in the State Library are Bureau of copy right;
- ▶ State Library for the blind;
- ▶ Inter Library Loan;
- ▶ State Bibliographical Bureau; Technical Services; and Mobile Service.

- ▶ Recognition of Village Libraries by the Government.

Chapter V is about the provision of financial assistance to recognized Village Libraries.

Chapter VI makes provision for:

- ▶ The recognition of State Library Association by the Council;
- ▶ To make rules to carry out the purpose of this Act.

The Mizoram Public Libraries Act, 1993 does not have the provision of library cess. The total expenditure for the establishment and maintenance of the public library system will be met from the State funds.

2.3 Academic Libraries

Academic Libraries consist of libraries in educational institutions ranging from school to Universities which provide facilities for students and teachers to read books or consult them for reference, thus widening the scope of classrooms learning and teaching and support research and other educational functions appropriate to their parent institutions. It may be noted that the distinction between one type and another one is not always sharp. An engineering and medical college library can be considered an academic as well as a special library. The Academic Libraries in Mizoram comprise School Libraries, College Libraries and University Library.

- ★ Academic Library
 - ▲ School Library
 - ▲ College Library
 - ▲ University Library

School Library

The secondary education Commission, (1994), appointed by the Government of India and headed by Dr.A. Lakshmanaswami Mudaliar, made the following remarks in its report about the condition of school

libraries India: "The books are usually old, outdated, unsuitable and usually selected without reference to the student's tastes and interests. They have stocked in few book shelves which are housed in an inadequate and unattractive room. The person in charge is often a clerk or an indifferent teacher who does this work on a part-time basis, and has neither love for books nor any knowledge of library techniques. Naturally, therefore, there is nothing like an imaginative and well planned library service which could inspire students to read and cultivate in them a sincere love of books. What makes this situation particularly difficult is the fact that most teachers and headmasters and even educational administrators and administrative authorities do not realize how unsatisfactory this position is, and therefore, they have no sense of urgency in the matter." In most of the Indian school, number of students is large, physical facilities are inadequate and teachers are not well paid. Education is largely text-book oriented. There is a great deal of dissatisfaction with existing system of education. However there are exceptions here and there. A school library serves the students and teachers. The objectives of a good educational system are to equip individual to be able to play their role in society effectively. A school library attempts to advance these objectives. A modern school library is supposed to serve as resource centre. Traditionally speaking, a collection of a school library would consist of books and magazines. In resource centre, besides books and magazines, other documents such as tape recorders, maps, charts, gramophone records, films newer media etc. are also acquired. In other words, audio- visual aids for teaching in class form an integral part of the library.

As per the rules, all secondary schools and middle schools in the country should have libraries. But large majority of them are not functioning in the best interest of the students and teachers. In primary schools from where the children have to develop the reading habit, there are no libraries at all.

School Authority

In Mizoram, we may recognize the following kinds of schools:

- * Primary School
- * Middle School
- * High School
- * Higher Secondary / 10+2 school

We may recognize the following kinds of authorities:

- ◇ State governments through department of education
- ◇ Local bodies (such as Panchayats)
- ◇ Government of India (Kendriya Vidyalaya, Navodaya Vidyalaya)
- ◇ Private bodies or individuals
- ◇ Others (public sector undertakings, etc.)

Education is state subject; a large number of schools are run by state government through their department of education. A few schools run by government of India. However, a large number are run by private bodies or individuals.

2.3.1 Position of School Libraries

According to Seventh All- India Educational Survey (Seventh All-India educational survey: Library, laboratory and science equipment facilities in schools, New Delhi, National Council of Educational Research and Training, 2002) conducted by NCERT, The position of school libraries in Mizoram is as given below:

- ▶ There are 802 recognized schools in Mizoram. Out of these only 14.58% have library facilities.
- ▶ 82.05% schools have less than 501 books, 11.11% have 501-1000 books, and 6.83% have 1001-2000 books.

- ▶ There is only one full time trained person holding charge of library. This means that 0.85% of schools have full time trained librarians.

From the above it follows that, the situation is too bad. Besides these schools, there are 11 schools run by Govt. of India. These are given below.

1. Jawahar Navodaya Vidyalaya Hrangchalkhawn Spo- Theiriat Lunglei
2. Jawahar Navodaya Vidyalaya Thenzawl Dt- Aizawl
3. Jawahar Navodaya Vidyalaya, Chhimtuipui.
4. Jawahar Navodaya Vidyalayas Thenzawal, Aizawl (serchip)
5. Jawahar Navodaya Vidyalayas Sedaikawn, P.O.thingsulthliah, Aizawl
6. Jawahar Navodaya Vidyalayas Mampui, Post Lawngtlai, Chhimtuipui
7. Jawahar Navodaya Vidyalayas Hbranchalkawn Lunglei
8. Jawahar Navodaya Vidyalayas Thingdawl, Near Agril. Farm, Kolasib
9. Jawahar Navodaya Vidyalayas Mamit
10. Kendriya Vidyalaya, Aizawl
11. Kendriya Vidyalaya, Lunglei

Mention may be made that, in these schools there are full time trained professionals holding the charge of libraries.

Objectives of a School Library

A school library does not exist for itself. It exists to serve the objectives of the parent organization. The objectives of good educational system are to equip individual to be able to play their role in the society effectively. The library attempts to advance the objectives of the school. The aim of a good school library is to become a force for educational excellence.

The objectives of a school library are given below

- ★ To acquire, process and make available documents with emphasis on non-book materials (such as films, filmstrips, videotapes/video cassettes, overhead projection transparencies, audio cassettes,

slides, gramophone records, etc. photographs, maps, charts, globes, newspaper clippings; models, handouts (duplicated summary of class lectures), nature specimen, artifacts etc.) to serve the needs of the students and teachers adequately;

- ★ To provide user education to enable students to become skillful and discriminating users;
- ★ To create among students, life long reading habits; and
- ★ To play an effective role in school programme.

In order to achieve the objectives, a modern school library is also considered a resource centre, providing open access to its users. It should be made a centre of informal education. Above all, it should be hub of the activities in a school.

Functions of School Library

In order to advance the objectives of the school education, a library should perform the following functions for teacher and students.

For teacher:

- ★ To provide for the requirements of the teachers with regards to text books, related books, reference materials, audio-visual materials (like atlases, maps, globes, tapes of various kinds, charts, films, filmstrips, slides models, photographs, etc.), curriculum enrichment materials (like books on method of instruction, formulation of curriculum, Psychology of children, etc.)
- ★ To provide information
- ★ To teach the use of library
- ★ To encourage and assist the teachers to teach through the library in accordance with the educational objectives.

For the students:

- ▶ To provide reading materials.

- ▶ To provide information
- ▶ To create reading interest amongst students by means of a story hour and a library hours.
- ▶ To assist children to enjoy reading experience, to read with discrimination and make profitable use of their leisure time. In the beginning when an attempt is made to create reading interest, then fiction books will have to be made use of. Later, when the interest has been created, the books of quality should be provided so that they are able to read with discrimination. At this stage they should be introduced to non-fiction.
- ▶ To provide guidance for students in the use of books, reference books and other materials and tools of the library. Thus, he/she will learn, how to search materials and information. The skill to use, reading materials and library catalogue, and ability to achieve understanding about the shelf arrangement are essential.
- ▶ To encourage and provide facilities for independent learning and self-propelled study both within syllabus and beyond it. For this purpose, the library should be made an attractive and inviting, a place pleasant to sit.

Services provided by School Library

A school library is service library. Therefore, it should provide open access to documents. These are acquired and processed for use. On other hand, close access aims at preservation. A school library does not exist for its own sake but aims to serve the users. In order to perform its functions, a school library can provide a variety of services. No service should be considered less important but under certain circumstances librarian may not able to devote enough attention to each of these.

A school library should provide the following services:

- ☛ Display of materials and information;

- ☛ Organization of story hour, book talk, book debates, essay competition, quiz etc.
- ☛ Initiation/orientation of a freshman;
- ☛ Reader's advisory service;
- ☛ Circulation of materials;
- ☛ Reservation of materials;
- ☛ Library instruction;
- ☛ Assistance in the use of catalogue;
- ☛ Assistance in the searching and location of materials;
- ☛ Assistance in the use of reference books etc. ;
- ☛ Provision of information on request;
- ☛ Maintenance of vertical files containing pamphlets, prospectuses, reports, press clippings etc.;
- ☛ Preparation of reading lists; and
- ☛ Inter- library loan

Display of materials and information can be done to attract the students and teachers. We may adopt the following devices to achieve the same.

- ☐ Organization of book exhibition,
- ☐ Display of Jackets of new books,
- ☐ Display of newspaper clippings,
- ☐ Display of lists of new books received, and
- ☐ Putting up of wall magazines.

Reader's advisory service is concerned with providing reading guidance to individuals that is what they might read. Students need to be provided this kind of guidance.

Circulation of documents to students and teachers is essential. Teacher would require documents for class room purpose. A system would have to be worked out between teacher and library.

A document requested by a student or teacher might have been issued out or got misplaced. The item may be reserved so that when it is returned or located, then it can be passed on to the concerned user.

User education consists of user awareness, interest profiling, library orientation and library instruction. Library orientation is the first level and library instruction is the second level. Library orientation is given in the beginning and is confined to provide an awareness of physical location of different sections, staff and services. Library instruction is a teaching function. The aim is to teach the user systematically as to how to use a library including use of documents and services. Library instruction is a learning process.

When a user (may be student or teacher) goes to the library, he/she might need assistance in: (a) use of catalogue, (b) Searching and location of documents (search is required when a document can not be located at the place where it should be expected to lie).

The educational system needs to be changed so that the school library becomes hub of the activities in the school. The role of the principals and higher authorities is extremely important in this regard. They should do all that they can to convert the school library so that it become a hub of the activities in the school. The success of any educational system should be judged on the basis of how far it has succeeded in cultivating reading habits among children. Even if a child does not complete schooling or does not go for higher studies, still he/she should be able to form a life long habit of reading. In this regard, a special responsibility rests on school librarians and teachers. In view of above, if we intend to improve school educational programme, then library facility must be improved at the school level. However, the present position in Mizoram is such that there is a wide gap between what has been achieved and what should have done. There is also a need to setup and achieve standards for school libraries. This will enable to bring improvement in the situation.

2.3.2 The Role of the Library in School Education

The role that the school library can play in molding the attitudes, personality and character has been realized in the writings and speeches of eminent educationists and has been often quoted by the writers. The school library has been described as:

“The heart that pumps out red blood” in the school.

The school library is the “Power house” of the school.

“The school library is the soul, the core, the pivot around which academic life in the school revolves. - B.R. Despande, (Educationist)

“A school library means, for the child, a new world of spiritual and cultural adventure; it means for the teacher unlimited increase in resource and power. It means for the school- a new atmosphere of learning, a visions of things intellectual. It means for the home -elements of common interest and the development of habit of reading for its aesthetic value alone.A school library is the most strategic point in an institution as it compensates for poor or bad teaching” – B.S.Kesavan (Former Library adviser to the Govt. of India, Ministry of education).

Dr.S.R. Ranganathan describes the role of the library in the content of modern education in the following words: “The library is the heart of the school, from which every activity in the school radiates and by which it all gets irradiated. The library should literally and figuratively be the hub of every educational institution and the librarians should be guide philosopher and friend of all its inhabitants.

School Education in Mizoram

Established as a separate Directorate in 1989, the Directorate of School Education is headed by the Director who is entrusted with overall administration of School Education.

The whole state is divided into 4 (Four) Education Districts such as, (1) Chhimtuipui District (2) Lunglei District ,(3) Aizawl East District (4) Aizawl West District.

There are 10(ten) Educational Sub-Divisions as follows.

- (1) Aizawl West-I
- (2) Aizawl West-II
- (3) Aizawl East-I
- (4) Aizawl East-II
- (5) Aizawl North
- (6) Kolasib
- (7) Serchhip
- (8) Lunglei West
- (9) Lunglei East and
- (10) Champhai.

Adult Education wing are (1) District Adult Education Wing (Aizawl West) (2) District Adult Education Wing (Aizawl East) (3) District Adult Education Wing (Lunglei) .

Directorate of School Education

The office of the School Education was established in the year 1973 and is located at Mc Donald Hill, Aizawl. DR G.N.Chatterjee was the first Director of School Education. At present, the Directorate of School Education is headed by Pu F.Lallura with three (3) Joint Directors, five (5) Deputy Director, two (2) Superintendents, seven (7) Group 'A' officers, seventeen (17) Group 'B' Officers and other 95 staff.

2.3.3 College Library

The first College in the State is Pachhunga University College established in 1958, which was later taken over by NEHU in 1979. During 1970's 6 (six) colleges were set up and in 1980's other 11 (eleven) colleges were established and in 1990 other 12 (twelve) colleges were established. With the development and establishment of colleges many small libraries emerge which are attached to these colleges run by one or two staff having a collection ranging from a few thousands to fifty thousands and the library service was limited only to lending and consultation of reading materials within the library.

College library serves students and teachers. It is expected to support the objectives of the college. Thus the basic function is to assist its parent body to carryout its programme. It must be serve the needs and requirements of the teacher and students towards reading, study and research. There are 26 affiliated Colleges with 7139 enrolled students. The college library scenario of Mizoram in detail will be discuss in chapter -3 i.e. College Library scenario in Mizoram

2.3.4 University Library

The clientele of a university library mainly consist of students, teachers, research scholars and administrative staff. Occasionally, the alumni and local community may also form the clientele. A university is supposed to perform following functions: Teaching, research, publication, conservation of knowledge and ideas, extension and service, and interpretation.

A university library is a part of university set-up. In other words, a university library should aim to advance the functions of its university. The major distinction between college library and university library lies in the fact that a university library lays emphasis upon research.

A University is supposed to perform the following functions; teaching, research, publications, conservation of knowledge and ideas, extension and service, and interpretation.

According to Wilson and Tauber, “the well-administered university library directs its activities towards the fulfillment of these functions. By accumulating and organizing books, manuscripts, journals, and other materials the university library serves as an invaluable aid in the conservation of knowledge and ideas and as a active force in the teaching, research, and extension programs of the university. Through direct assistance to the members of the faculty and research staff and through the service of members of library staff as an instructional officer, the university library participates in the interpretative functions of the university. Through its bibliographical and other reference services the library aids individuals of the instructional and research staff who are engaged in the preparation of materials for publication. Thus a modern university library aims to function as a dynamic instrument of education. It has a significant role to play in the fulfillment of objectives of higher education.

Setup on 2nd July 2001, this is the only university in the state of Mizoram. It evolved from an earlier small campus of North- Eastern Hill University that consisted of 7 PG Departments in rented buildings and a University College (Pachhunga University College) that catered to UG teaching. The University is located at the capital city Aizawl and spread over two campuses: a 1000 acres main campus on the outskirts of the city(PG Departments) and 750 acres campus in city (UG Departments). Future Departments and facilities will be spread in both campuses in a complementary manner. Currently, the University has 28 PG (Organized into nine school of study) and 19 UG (Organized into a University college with a Principal) Departments with nearly 2000 students.

Objectives

The objectives of the University, as laid down in the Act are “ to disseminate and advance knowledge by providing instructional and research facilities in such branches of learning as it may deem fit, to make provisions for integrated courses in humanities, natural and physical sciences, social sciences, forestry and other allied disciplines in the educational programmes of the University and to pay special attention to the improvement of the social and economic conditions and welfare of the people of that state, their intellectual, academic and cultural development.” Keeping these objectives in view, Mizoram University has embarked on various programmes / schemes in terms of academic and administrative development.

Composition

The jurisdiction of the Mizoram University extends to the whole of Mizoram, the erstwhile jurisdiction of Mizoram Campus of NEHU, Shillong which existed till 01.07.2001. There are at present 29 affiliated colleges/ institutions under Mizoram University including one constituent college, namely Pachhunga University College.

During 2002-2003, the Mizoram University central library entered a new phase of its re-organization. The newly constituted library committee had its first meeting in the month of April, 2002. The library got the benefit from 22 staffs including one information scientist. The Mizoram University Central Library inherited its collection, equipment, furniture etc. from North Eastern Hill University. Library collections during first three years of the existence of Mizoram University Library, 10,467 books were added to the collection, bringing the total collection to 29,340.

The Central Library of Mizoram University has a collection of over 36,078 with 212 periodical subscriptions. Its membership amounts to 712 with daily visitors of 126. The Library has 9 (nine) professional staff with 11 (eleven) non professional staff providing reference, circulation,

reprography, current content service and important articles published in the newspaper and weekly publication are brought to the notice of the users through the publication of Index of articles.

2.4 STATE COUNCIL OF EDUCATIONAL RESEARCH & TRAINING WING

The State Council of Educational Research & Training (SCERT) was set up in January 1980. It is an academic wing of the Directorate of School Education and is located at Chaltlang since its establishment and now is headed by Pi Malsawmthangi, Joint Director with two Deputy Directors. Twenty four (24) Group 'A' Officers, eight (8) Group 'B' Officers and other seventy one (71) staffs.

SCERT is responsible for qualitative improvement of School Education from Primary to Higher Secondary Schools, Non-Formal Education and Teacher Education. It is also responsible for successful implementation of various education projects sponsored by Central Government, UNICEF as well as State Government. There various wings in SCERT and are as follows:

- Teacher Education & Extension Service
- Educational Technology
- Area intensive Education Project
- Language Promotion Wing (District Centre for English)
- Project Integrated Education for Disabled (PIED)
- Curriculum Development & Evaluation
- Population Education Project.
- Research & Development
- Educational & Vocational Guidance & Counseling Unit.
- Vocationalization of Secondary schools
- Integrated Education for Disabled Children (IEDC)
- Environmental Orientation to School Education
- Non-Formal Education (NFE)

- Science Promotion Wing

More information please visit <http://www.scertmizoram.com/>

2.5 DISTRICT INSTITUTE OF EDUCATION AND TRAINING: AIZAWL

The DIET, Aizawl was established in 1st September, 1975 and is located at Chaltlang. The head of office at the time of establishment was Pi Lalziki Sailo. There are 70 incumbents in this office and is headed by Pu Pasena Sailo with one Vice-Principal, 14 Lecturers, Superintendent, 2 Hindi Instructors, one Weaving, Knitting Agriculture, Craft and Sewing Instructor each, one inspector of statistics and other fifty one (51) staff. There are 9 trained teacher in Primary and 9 in Middle section. The DIET can accommodate 45 primary teachers 92 Middle teachers and 20 others every year. DIET look after practicing school.

2.6 DIET, LUNGLEI

It was established in 1974 and is located at Lunglei. The name of the Institute at the time of establishment was UGTTI and is now upgraded as DIET. The Institute is headed by a Principal. At present, Pu Aihnuna headed this institution with 2 Lecturers, Superintendent, and 7 instructors for 4 W.E Instructors, one graduate Hindi Teacher, two W.E. Teachers and other 20 staff. It can accommodate 50 primary teachers and 45 middle teachers every year. Growth and Achievement: The School Education Directorate separated as a directorate in 1989 has attained much achievement and grow immensely since it was a separate Directorate. The 10+2 course i.e Class XI and XII which is known as Pre University classes attached to College in Higher School has been brought under the School Directorate since 1996. The number of Primary Schools in 1989 has increased from 1084 to 1318, Middle Schools from 522 to 773 and High School 185 to 345.

Formal Education in Mizoram started with the arrival of Christian Missionaries. It was the Christian missionaries who abridged Mizo language into writing. In doing so they adopted Roman scripts in 1894. For more than half of the 20th century, i.e. from 1895 to 1952, the Church through Honorary Inspector of Schools looked after Elementary Education. The important landmarks in the field of education in Mizoram are given below:

Table 1. Landmarks of Education in Mizoram

SI.No	Events	Year
1.	First Primary School at Aizawl	1898
2.	At Rural Areas	1901
3.	Opening of the First Upper Primary School	1907
4.	Opening of the First High School	1944
5.	Establishments of the First College	1958
6.	First PSLC Examination	1903
7.	First MSLC Examination	1909
8.	First Matriculation Examination	1048
9.	Establishments of the First College of Teachers Education	1975
10.	Establishment of Mizoram Board of School Education	1975
11.	Establishment of SCERT	1980
12.	Establishment of Mizoram University	2001
13.	Establishment of ICFAI in the State	2005
14.	Establishment six mini DIETs in the State	2005

2.7 Special Library

A special library is a one, which is specializing in a particular subject or group of subjects or particular form of documents. Some people even

consider libraries serving the needs of special clientele (e.g. Blinds, prisoners, patients, children etc.) as special library. A special library exists to serve its parent body. Therefore, aim of a special library is to further the interest of its parent body. The clientele to be served will generally be limited but often being specialist would be well informed in their area of specialization. Special libraries are a natural outcome of the need for information support to research and development, business and industry, expanded functions of governments and similar other organizations. While other types of libraries serve multiple objectives such as education, research, recreation, cultural and social activities, the major and the only objective of a special library is the provision of information, in support of the objective of its parent organization. Special libraries exist in a wide variety of organizations, most of them being units of larger organizations, their purpose are usually other than provision of education or conventional library services, invariably meeting the information requirement of the organization to which they are attached. Special libraries are formed in research and development establishments, government departments, directorate, industrial and business undertakings and health services, social and welfare organizations, museums, national gallery of arts, etc. However, special library are also established to serve a particular group of users or specialist working on a subject or a group of subject or on a particular type of documents. The special libraries have their own individual character and scale of development. It may not be therefore feasible to draw up development plans on a national scale for the special libraries. No single authority of the government is in charge of the responsibility for the development of special library in our country. The responsibility is mainly with the several scientific organizations functioning under the Ministries and departments of the Central and State Government and in the private sector. The importance of special libraries for supporting research activity is accepted in our country without any reservation. The management of every research institution is aware of the

needs of the library and takes care to provide all the support that is necessary. In this respect the special libraries are in a more advantageous position compared to other kinds of libraries.

Mizoram, located in the far North East of India is in its infant's stage in special libraries, due to the slow progress in the development of research facilities, the state has only a few special libraries which are attached to Government Department, Directorate and Institution.

Scenario of Special Libraries in Mizoram

The special Libraries in Mizoram came into existence only from 1970's with the establishment of medical institution. Engineering Institute for Computer and Information Technology and Government Department, in Mizoram special libraries are yet to develop, the Public Library system began to evolve first and had made its inroads into the development of other kinds of libraries. Even now the special libraries in Mizoram are in its infant stage where as Public and Academic Libraries of varying magnitude are growing in number steadily. The state has a small number of special libraries and are normally established, maintained and managed by the organizations to which they are attached. The entire scope and range of activities are determined by the role and characteristics of the parent organization, because of limited support and encouragement from the Government and parent organization the progress and development of special libraries are very slow which effect the collection, building and equipments, library personnel and library services.

The important special libraries of Mizoram are :

- i) Assembly Secretariat Library, Aizawl.
- ii) Agriculture Department Library, Tuikual.
- iii) Administrative Training Institute, Tuikhuahtlang,
- iv) College of Veterinary Science and Animal Husbandry Central Agricultural University Library, Selesih.

- v) Department of Electronic and Accreditation of Computer Course Centre, Zuangtui.
- vi) District Institute of Education Training Library, Chaltlang.
- vii) Lunglei Polytechnic Library, Lunglei.
- viii) Nursing Library, Civil Hospital, Aizawl.
- ix) Presbyterian Hospital Library, Durtlang.
- x) Regional Institute of Paramedical & Nursing, Zemabawk.
- xi) State Council of Educational Research and Training Library, Chaltlang.
- xii) Women Polytechnic Library, Durtlang.

2.7.1 LIBRARIES AND INFORMATION SERVICES PROVIDED BY SPECIAL LIBRARIES

The reputed library scientist D.J.Foskett defines a special library as 'one serving a group, having an extra library existence, whose members direct at least some of their activities towards a common purpose. This includes academic libraries as their were pursue their individual ends, and are in no serve united by a common purpose'. "The group served, according to Foskett, may be a government department, a professional association, an industrial firm, a research association or an institute or any similar organization. Special libraries serve organizations with a clearly defined group policy, and members of the group have indicated their acceptance of this policy by the fact of their joining, which implies their recognition of a common interacts".

A special library is a power house for the generation, storage and use of information. It performs the following functions:

- ▶ Collects, maintains, stores and retrieve information and data keeping in view the evolving needs of its parent organizations.
- ▶ Analysis, synthesizer and evaluate information and data.
- ▶ Provides critical reviews, monographs, reports and or collections.
- ▶ Provides critical compilations.

- ▶ Provides state of the art reports.
- ▶ Provides replies to queries.
- ▶ Provides reprints, bibliographies and references.
- ▶ Performs literatures searches and translations services.
- ▶ Provide abstracts, indexes and extracts.
- ▶ Prepares accession list, bulletins, newsletters, summary, hand books or manuals.
- ▶ Disseminates current information and S.D.I. and thus does stimulate research.

Besides there, it has some more functions to perform:

- ▣ Establishes simple order record.
- ▣ Reviews library, collections to build up weak areas.
- ▣ Establishes a monitoring system for the evaluation of performances.

All the activities of a special library are derived from two basic types of information services that are provided by them, the first service is provided in response to users request for information's covering reference and literature search. The second is information service in anticipation of need and includes indexing, abstracting services which are designed to keep the users updated on new and current information. Decisions about collections development of the library, proceeding and organization of documents appointment of staff etc. are made on the type and extent of services to be provided.

A special library collection is a working collection maintained to support its information services, with an emphasis on current information and retrospective material, determined on the basis of the projects and programmed of the parent organization. The three major component of the collection are:

- ★ Published information available in books, periodicals, reports etc.
- ★ Information generated within the organization such as research

report, working papers, newsletters, sales literatures etc.

- ★ External information i.e. information collected from sources available from outside organization.

Special libraries employ a wide variety of methods in organizing their collections. The physical storage of its collection is determined on the basis of use, catalogues, indexes, abstracts are prepared on the basis of ease of use, scope of the activities of the parent organization and coverage. Classification, cataloguing and indexing system also are single in their design, but are chosen to meet their requirement effectively.

i) Reference services

The method of providing personal attention to readers in term of meeting their specific needs for document or for any information contained in them is called reference services. User are usually assisted in the pursuit of their own search for literature but quit often information expert is made available in locating requested information and transmitting them in the most useful form.

ii) Current Awareness Service

Any service intended to meet the current approach to information is known as current awareness service, this service is mean to keep researchers, advance level teachers and such other abreast of current development taking place in their respective field of study and research. The service can be offered in the form of weekly bulletin, monthly accession list and display of new arrivals, current content publication and routing of journals to users.

iii) Selective Dissemination of Information

The SDI is a service, which is for keeping the user of the system informed of new development in their respective areas of interest without overburdening them with non relevant and unwanted documents. It provide notification of new primary documents, notification are based on a match between a readers interest profile and document profile.

iv) Indexing and Abstracting Services

Indexing and abstracting services present the contents of primary documents in a systematic condensed form. They together list and arrange the relevant items from primary document for easy and quick access. A good collection of indexing and abstracting facilitate literature search.

v) Literature search services

There are occasion when user want to know anything that has been published on a subject, such information need can be satisfied by undertaking a comprehensive search in bibliographies-the indexing and abstracting publications, this is called literature searching. A comprehensive literature search can be done very fast using online databases.

vi) Bibliographic service

This is a conventional service offered in many libraries for a long time. University and special libraries have to offered this service quite frequently, as the clientele as well as their information needs are fairly well defined. Short bibliographies on topical subject areas may be compiled on occasions to highlight some resent literature. These types of services may be on the eve of seminars, workshops and such other occasions.

vii) Referral Service

A referral service is some sort of information desk for the scientific and technical community which does not provide directly the information need, but suggest sources that likely to satisfy the clients. An efficient referral center maintains an exhaustive inventory of significant information sources and also publishes directory of such sources.

viii) Translation Service

Translation services are provided to overcome the language barrier; literature in other language need translate into a language which is intelligible to the user. These types of translation service are usually provided as:

- a) A complete literal translation of document,
- b) A free translation of the major point of the document and
- c) Oral explanation of content of the document.

ix) Document Delivery Service

The provision of document by a library or information center from its own resources or from some other sources, the service that supplies the required document to the user on demand is known as document delivery services, the document may be an original one or a copy. Inter library loan is one function of document delivery service.

x) Reprography Service

If the original document is not available in the library, its photocopies are provided by a document delivery service. The demand for photocopies have increased considerable, libraries and information center therefore, have developed photocopying facilities to provide reprography services, this service is given only on an individual basis to avoid copyright violation.

xi) Online/Internet Based Information Services

The special libraries also provide access to local library resources by providing access to online catalogue, bibliographic database and directories or providing access to resources outside the library by providing access to other collections and to other online services and also provide access to external information through internet.

In general special libraries and managed by small staff. One of the continuing debates in the field is whether a special librarian should be

primarily a subject specialist or a library professional or both. But most of the controversies on this issue are getting resolved as person with different subject expertise are taking increasingly the special librarianship and documentation. Thus, the new breeds of specialists are competent and have the expertise required to handle various activities of a special library.

2.7.2 LIBRARY AND INFORMATION SERVICES PROVIDED BY SPECIAL LIBRARIES OF MIZORAM

Special libraries in Mizoram are very limited and in many of the special libraries, the services are not provided as they are expected and supposed to provide. However with limited resources of these special libraries, they are only providing the day- to- day normal services to the users. Brief descriptions of the services extended by these special libraries are given below:

*** Assembly Secretariat Library**

The library of Assembly Secretariat occupied the 4th Floor of the Assembly building. It was computerize on 6th May, 2002 and use Libsys Library's software, book and classified according to Dewey decimal classification schemes and followed the AACR-II for cataloguing rules. The whole building has LAN network.

*** Collection**

The library has a special collection of 15000 volumes of constitutional document, 3000 volumes of reference books and 30 periodicals and journals mainly of Indian publication.

*** Membership**

The library is specially designed for the member of Legislative Assembly. The following persons are entitled to get enrolled as member.

- i) Member of Legislative Assembly.
- ii) Officer and staff of the assembly secretariat.

- iii) Mizoram Government Officers.
- iv) Researcher/Scholars.

*** Library Services**

The library provided lending services to its member for a period of 14 days. It also provided reading and consultation of different books and government document.

*** Library Hours**

The library remains open from 9:00 am to 5:00 pm. on all working days and remains close on the state holiday.

Library staff

The library has one qualified librarian, 1 (one) office clerk, 1 (one) library Attendant with 2 (two) Peons. The library committee consist of the Assembly Speaker as Chairman and librarian as Member Secretary with 2 (two) MLA from each political parties. The committee has full authority in acquisition selection, maintenance of the library. The whole budget for the library was met by the state government.

*** Agriculture Department Library**

This library was also called 'Farmer Library' it is design to meet the information need of the farmer, student and researcher.

*** Collection**

Library houses specialized collection In agriculture, fertilizer, irrigation. It collection includes:

- i) 1300 number of Agriculture and related books.
- ii) 25 of Agriculture publish items.
- iii) 5 Journals.
- iv) 30 thesis of Master Degree in Agriculture.
- v) 5 Ph.D thesis.

*** Library Hours**

The library remains open from 9:30 am to 5:00 pm. on all working days.

*** Services**

The library provide only reading and consultation service to user it does not have lending facilities.

*** Number of User**

The farmer, students and researchers constitute most of the user; about 20 users consult the library per day.

*** Library Staff**

The major draw back of this library is the absent of qualified librarian and staff. The librarian was maintained by one ministerial staff of the Directorate. Books are arranged according to subject and it has a small reading room which can hold about 8 people at a time.

*** Administrative Training Institute Library**

The library of Administrative Institute was located at the Southern part of Aizawl City at Tuikhuahtlang, it was establish in 1983. The department provides training courses to Government servant of the state on service rules and regulations.

*** Collection**

The library was specialize in the collection of Central Civil Service Rules, Leave Rules, Office procedure the collection amount to 7000 books a few journal of law, Swamy Journal.

*** Membership**

The trainees of the Institute constitute most of the members other member are the officer and staff lecturer and professor.

*** Library Services**

It provides lending and consultation service to its members, its lending period is 7 days which can be extended as per requirement.

*** Library Hours**

The library remains open from 9:30 am to 5:00 pm on all working days.

*** Library Staff**

The library is looked after by one office clerk and does not have a provision for post creation. The library of ATI does not have any separate budget for the development of the library. The financial requirement was met from the fund of the Institute. A proposal for creation of librarian post is already made but is not yet approved.

LIBRARY OF COLLEGE OF VETERINARY SCIENCE AND ANIMAL HUSBANDRY CENTRAL AGRICULTURAL UNIVERSITY

The library is located at Selesih, it was established in the year 1998. It is now shifted to its own campus. The library has a qualified professional staff, books are classified according to Dewey's Decimal Classification schemes and followed the AACR-II for cataloguing rules.

*** Collection**

The library has a collection of 4211 books at present and 30 nos. of Indian journal and 16 nos. of foreign journal, the subject of its collections varied from Veterinary Science to Agriculture Science.

*** Membership**

Only the student, Officer and staff of the Institute were the members of the library.

*** Library Services**

The library provides circulation service, reference service and reprography services to its members, the members can borrow books for a period of 15 days. The average number of users per day is 30.

✿ **Library Hours**

The library remains open from 9:30 to 4:30 pm. on all working days and remain closed on Sunday and National Holidays.

✿ **Library Staff**

The library was run by 2 (two) professional staff, 1 (one) as senior Library Assistant and other as Library Assistant with 2 (two) library attendants. The post of librarian and 2 (two) post of Library Assistant is still lying vacant.

✿ **Budget**

The annual budget for collection development, maintenance of the library is around 30 lakhs. The entire financial resources come from Government of Indian. The library services was carried out in the traditional method, however, there is a proposal for automation of the library but is not yet approve by the authority.

DEPARTMENT OF ELECTRONICS AND ACCREDITATION OF COMPUTER COURSE CENTRE (DOEACC) LIBRARY

DOEACC was established in the year 2001 in collaboration with state government, Industry Department and Department of Information and Technology under the Government of India and located at Zuangtui. It offered Degree, Diploma and Certificate Course of the following:-

- a) Bachelor of Computer Application.
- b) Bio Information.
- c) Computer Application.

* **Collection**

Library houses specialized collection of Computer and related information, the total collection amount to 1500 books and 36 journals and a few CD-ROM.

*** Membership**

The students of the Institute and Officer and staff are the member of the library.

*** Library Services**

It provides lending service to member for a period of 7 days, other services include reference service, reprography and catalogue search by title entry. The total number of user is 50 per day.

*** Library Hours**

The library remains open from 9:30 to 5:00 pm. on all working.

*** Budget**

No separate budget was proposed for the library the necessary financial requirement was meet from the existing fund of the institution which came from the department of Information Technology Government of India.

*** Library Staff**

The library was under the control and maintenance of one librarian with professional skill with only one library attendant. Automation of the library has been started using 'Smart Library' software which is locally developed for the library. Books are classified according to Dewey's Decimal Classification scheme and use AACR-II for catalogue rules.

DISTANCE INSTITUTE OF EDUCATION TRAINING (DIET) LIBRARY

The library of District Institute of Education Training and established in 1989, it is located in Chaltlang in it own campus. It provides academic support to school education by providing training for primary and middle school teachers.

★ Collection

The library specialized in the collection of History, English, Education, Political Science, Psychology and the collection amount to 4,000 books with Charts and Maps.

★ Membership

The Trainees of the Institute and staffs are the members of the Library.

★ Services

The library provides only reading and lending service to its members. Trainees have the privilege of borrowing 2 books for 7 days and 6 books for 1 month to teaching staffs.

★ Library Hours

The library opens from 9:30 am to 5 :00 pm on all working days.

★ Library Staff

The library has only one post of library attendant which is not yet filled, the library is run by semi skill staff having certificate in Library Science.

★ Budget

The library does not have a separate budget, the proposal for acquisition was approved by the authority from time to time which usually amount to Rs.6,000.00 per year. The library used the Dewey's Decimal Classification rules. It has a good reading room and about 20 users visit the library per day.

LUNGLEI POLYTECHNIC LIBRARY

Lunglei Polytechnic Institute was established in the year 1981. The Institution provides training in Engineer for Diploma Course. It is the only Institution providing Engineering Course. It has its own Campus located in the Northern part of Lunglei.

◆ **Collection**

The library of Lunglei Polytechnic specializes in collection of books of engineering discipline. The collection of books amounts to 1212 numbers and journals 7 numbers.

◆ **Membership**

The trainees, teachers and staffs compose the members of the library.

◆ **Library Services**

The library provides circulation services, reference services and reading room services to its member.

◆ **Library Houses**

The library opens from 9:30 am. To 5:00 pm on all working days.

◆ **Library Staff**

The library has two staff one as librarian and the other as Assistant Librarian both are non professional.

◆ **Library Budget**

The library does not have a separate budget, financial requirement are sanction by the Institution authority when need arise. The finance for the library as well as the Institution came from World Bank. Technical processing work is totally absent and book are arrange according to subject wise. The arrange number of user is 50 per day mainly consists of students of the institute.

NURSING LIBRARY CIVIL HOSPITAL

The library was established in 1980 to meet the information requirement of the students of General Nursing Midwife (GNM)

▣ **Collection**

The library specialized on the collection of medical text, General English, Psychology and Administration and Management, the collection amount to 1,800 books and a few journals, the journal collection include.

- i) Nurses of India.
- ii) Nursing Journal of India.

- iii) Herald of Health.
- iv) My Doctor.
- v) Nemesis.

▣ **Membership**

The member consists of mainly students of the Nursing School, it also provide reading service to outside user others members includes Doctors and staffs of the Nursing School.

▣ **Library Services**

Lending and consultation services are provides to its members. Lending was provided only for 1 (one) days, the average number of users per day is 20 to 30.

▣ **Library Hours**

The library remains open from 9:30 am. To 5:00 pm. on all working days.

▣ **Library Staff**

The library does not have qualified staffs, one nursing staff was detailed to look after the library.

▣ **Budget**

The library does not have a separate budgets, the' financial requirement was meet from the existing fund of the institute. The library also received aids and grant from Government of India, Ministry of Health for purchase of books. The Nursing School authority has made a proposal for up gradation of the existing school to a college level which include a proposal for creation of librarian post until than the library is to be run by non professional staff.

PRESBYTERIAN HOSPITAL LIBRARY

The library of Presbyterian Hospital was located at Durtlang, it was under the administrative control of Principal Nursing School. The library was

devoted to the student of the Nursing School and was established in the year 1944.

◆ **Collection**

The total collection of the library is 2600 books which related to the nursing studies. The library also received grant from Raja Ram Mohan Roy Library Foundation through state library mainly consisted of local language books of 959 numbers.

◆ **Membership**

The students and faculties of the Nursing School are the only member of the library.

◆ **Library Service**

The library provides only reading and lending service for a period of 7 days.

◆ **Library Hours**

The library remains open from 9:30 am to 5:00 pm. on week days. The library remains close for 16 days in a year according to the Synod Holiday.

◆ **Library Staff**

The library has only one staff with no professional skill. However, a proposal for librarian was made along with the up gradation of the course to a Degree.

◆ **Budget**

The budget for the library change every year for the year 2005 the annual budget is 1 (one) lakhs for collection development and maintenance of the library. Due to lack of fund and professional staff the library developed a little since it was established. The average number of users per day is 40 users daily.

REGIONAL INSTITUTE OF PARAMEDICAL & NURSING (RIPAN) LIBRARY

The Regional Institute of Paramedical & Nursing was established in the year 1995 as an autonomous Institute under North Eastern Council, Shillong with necessary approval of the Ministry of Health & Family Welfare, Ministry of Finance and Ministry of Home Affairs, Govt. of India. Its objective being to impact training for developing skilled manpower in Paramedical & Nursing in North East Region through a systematic curricula of course as under :

- | | |
|-----------------------------------|--------------------------------|
| i) B.Sc (Nursing) | - Degree Course |
| ii) Medical Laboratory Technician | - Certificate & Diploma Course |
| iii) Pharmacy | - Diploma Course |
| iv) X-Ray Technology | - Diploma Course |
| v) ECG Technology | - Diploma Course |
| vi) Ophthalmic Technology | - Diploma Course |

The Institute is affiliated to Mizoram University and recognized by Mizoram Nursing Council, Indian Nursing Council, Pharmacy Council of India, All India Council for Technical Education and Mizoram Science Council for Technical Education. The Library of RIPAN came into existence in 1997 to support the educational objective of its parent institution.

⊙ Collection

The Library houses specialized collection in Paramedical and Nursing Science. The collection amounts to 2050 numbers of books and 35 journals which is as follows:-

- | | |
|-----------------------------------|-------|
| i. Pharmacy | - 639 |
| ii. B.Sc (Nursing) | - 785 |
| iii. Medical Laboratory Technical | - 295 |

iv.	Ophthalmic Technology	-	70
v.	Electrocardiography	-	23
vi.	X-Ray Technology	-	37

⊙ **Membership**

The student, Officers, Faculty and Staffs of the Institute can be a member of the library each member is entitles to borrow 5 books for a period of 1 week.

⊙ **Library Service**

The Library provides reference service, circulation service, reading room service, reprography services and library catalogue of title, author and subject access.

⊙ **Library hours**

The library remains open from 9:30 am to 5 :00 pm on all working days and remains closed on State Holiday.

⊙ **Library staff**

The control and maintenance of the library was carried out by the librarian having Master Degree in Library and Information Science with two library Assistant having B. Lib. and one attendant.

⊙ **Library Budget**

The budget for collection development, maintenance, and subscription of periodical varied from year to year. The proposed budget for the library for the year 2005 amount to Rs.3 5 lakes.

⊙ **Processing**

The Dewey Decimal Classification scheme was use for classification and subject heading from Sears list of subject heading and followed AACR-II for cataloguing rules. The collection of the library is increasing every year along with the number of journal subscription. A proposal for automation of library is also submitted to the Institution authorities with networking of

the Library, in this respect DELNET has been approach for network requisite and possibilities for increasing the library service.

STATE COUNCIL OF EDUCATION RESEARCH AND TRAINING LIBRARY

The library of SCERT was established in 1983. It was located in the northern part Aizawl at Chaltlang. This Institute provides short term training to Teachers at all level and engages in broadcasting of educational programmes.

▣ Collection

The library collection amount to 9060 which include book of Religion, History, Economic, English, Education, Political Science and Philosophy and reference material, also 20 journals and serials.

▣ Membership

The trainees and Officers and staffs of the Institute are the only members of the library.

▣ Services

The library services is limited only to reading and consultation, the trainees were not allowed to borrow books and can only consult the library materials within the library. Only the teaching staff has the privilege of borrowing books.

▣ Library Hours

The library remains open from 9:30 am to 5:00 pm on all working days.

▣ Library Staff

The operation and maintenance of the library was assigned to one ministerial staff. The post of librarian remains vacant due to negligence by authority.

▣ **Budget**

For purchase and subscription of journals Rs.50,000.00 is allocated for the year 2005. Books in the library are arranged in subject wise, technical work is totally absent, in spite of it good collection only few user visit the library which is 5 to 10 users per day, there is no reading table or space within the library, all the space is occupied by book shelve and rack.

WOMEN POLYTECHNIC LIBRARY, DURTLANG

The Women Polytechnic Library was located at Durtlang in it own campus. It is recognized by the All India Council for Technical Education. It was established in 1997 and financial assistance entirely from World Bank. The Institution provides the following courses:

- i) Modem Office Practice.
- ii) Electronic and Telecommunication.
- iii) Engineering and Garment Technology.

◇ **Collection**

The Library has a collection of 4795 books relevant to the course offered by the Institute, in addition to this it has 17 no.'s of journal.

◇ **Membership**

The students and faculties of the institute mainly compose its member.

◇ **Library Service**

Lending and consultation service are provide to its member, lending for a period of 15 days is provide and the average number of user per day is 30.

◇ **Library Hours**

The library remains open from 9:30 am to 5:00 pm on all working days.

◇ **Library Staff**

The library was run by one professional staff with one library attendant. The post of library assistant is lying vacant and is not yet filled. The library has a good accommodation facility and reading room, book are classified

according to Dewey Decimal Classification and followed AACR-II for the cataloguing rules.

2.8 Conclusion

In Mizoram, majority of the public can not ordinarily afford to purchase book and other reading materials; therefore they will depend upon public libraries for reading materials. Many of them would need reading material for self improvement and their survival in the society. Public libraries in Mizoram have a special responsibility towards illiterates and neo-literates. 'Reading to illiterates' hour can be organized by public library. The educational system needs to be changed so that the school library becomes hub of the activities in the school. In order to encourage the school library effectively, it is essential that reading habit is cultivated amongst children. Even if a child does not complete schooling or does not go for higher studies, still he/ she should be able to form a life long habit of reading. In this regard, a special responsibility rests on a school librarian and teachers. The college libraries, with a few exceptions have been unable to provide adequate collections and services to meet the requirements of the users effectively. Thus these have been found inadequate as instrument of instruction. Our educational system is under great strain and stress. A university library being an integral part of the university is equally affected. University library in Mizoram has to cope not only with increasing number of users from newer fields of study, teaching and research. A special library is expected to procure, process, retrieve and disseminate information, document and data. A special library exists to serve the information needs of the users. It aims to provide required information pin pointedly, exhaustively and promptly in usable form. There is a need to improve quality of service in Mizoram. A detailed scenario of college library is discussed in the following Chapter-3 entitled "College Library Scenario in Mizoram".

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CHAPTER- 3

COLLEGE LIBRARY SCENARIO IN

MIZORAM

3.1 Introduction

Higher Education, contributed through a college is recognized as a viable tool for the development of human resources which not only alleviates poverty, but also contributes significantly to growth in national productivity. In general a college is regarded as a gate way for higher learning which usually offers a three years or a four years course after school education leading to a bachelor's degree. Some of well established colleges also offer courses leading to Master's degree. University in general is considered to be a hub center for research. The library, a center of learning is generally attached to a college which caters to the need of the undergraduate and post graduate students, research scholars and the faculty. College Library happens to be a viable platform for growth of knowledge in different fields which act as a sustainable strength of a student in his future. Hence it can be said that, the college library is indispensable for future development of a student.

Types of Colleges

The colleges may be categorized into the following types.

- ☛ General
- ☛ Special (a college may specialize in a subject such as agriculture, animal husbandry, arts, engineering, law, medicine, science, etc).

3.2 Objectives and functions of a College Library

The partial statement of objectives of Milwaukee Downer College library given by C.H. Brown, Chairman, Committee of War Time Activities, Association of College and Reference Libraries, USA, is short but comprehensive. It states that a college library should work:

- (1) In scholarship, the college wishes to stimulate thoughts, to help students, to obtain, recognize and evaluate knowledge.

- (2) To familiarize them with the possibilities for further education and scholarship after their college years are over.

The Education Commission (1964-66) has also made some recommendations for the successful functioning of a library. Important amongst them are as follows:

- ◆ No new university, college or department should be setup without taking into account the library needs in terms of staff, books, journals, space, etc. Nothing could be more damaging to a growing department than to neglect its library or to give it a low priority. On the contrary, the library should be an important centre of attraction in the college or university campus.
- ◆ Even more important is a proper use of books by students and teachers. Lecturers should be supplemented by tutorial instruction, and thereafter the students should turn to the library to find for themselves, with the help of references librarians, the relevant material and knowledge needed. More working hours and working days, easy accessibility of books, adequate provision in terms of staff, multiple copies of textbooks which may be loaned to needy students better display of new reading materials, organization of book clubs, separate rooms for periodicals, reference books and research works are some of the measures that would help to raise the standard of library service. Reading habit which is appallingly low must be turned up in every possible way.
- ◆ Even a collection of good books, does not constitute a library. Given enthusiastic teachers, “who teach with books” and librarians who can cooperate with them in converting the library in an intellectual workshop. Even a comparatively small collection of sensitively chosen books may work wonders in the life of students

without such a staff. The most luxurious building or extensive book collection may have no effect at all.

A library should

- ▶ Provide resources necessary for research in fields of special interests to the university
- ▶ Aid the university teacher in keeping himself abreast of developments in his field
- ▶ Provide library facilities and services necessary for the success of all formal programmes of instruction;
- ▶ Open the door to the wide world of books that lie beyond the borders of one's own field of specialization; and
- ▶ Bring books, students and scholars together under conditions which encourage reading for pleasure, self-discovery, personal growth and the sharpening of intellectual curiosity.

A college library can supplement the teaching programme by various methods , as President Truman's Commission on Higher Education says : "The college library should be re-graded as the instrument of instruction . The library is second only to the instructional staff in its importance for high quality instruction and research. Both for humanistic and scientific students, a first class library is essential in a university. College library can supplement the teaching programme by various methods. "However, functions of a college library, presented by L.R. Wilson, can be summarized as under:

- ◇ Furnishing background for the work carried on in the class –room, in the laboratory and in the society.
- ◇ Imparting to the student the ability of using books and indexes as tools.

- ◇ To provide recreational materials.
- ◇ To help for broadening the outlook on life of the student.
- ◇ To develop the heavenly vision and go forth, be obedient to it which helps to instill in its students proper conception of intellectual freedom.
- ◇ To develop within the student bodies sensitiveness to beauty and the appreciation of truth.

From the objectives and functions cited above, it can be concluded that a college library should be aimed at:

- (1) Enabling and encouraging the student to form the habit of self-education and also enabling him to familiarize himself with various types of information sources which will help his intellectual development in future life ; and
- (2) Familiarizing each faculty and student with the bibliographic tools and reference materials which will aid his future research and instructional activities.

The first ever University Education Commission, constituted after independence, under the chairmanship of Dr. S.Radhakrishnan, had also given due attention towards the functions of university libraries. Unfortunately, the suggestions made it 50 years ago have not yet been fully implemented and hence the situations in the college libraries were found unsatisfactory. Some of the observations made by this Commission were as follows:

- ★ In most of the college and universities the library facilities were very poor indeed.
- ★ Not only was the provision for keeping the library up-to-date, very inadequate but at one place no attempt had been made to weed out old and obsolete books or old editions and replace them with new editions of some books also .

- ★ The library was just a mass of books stacked somehow, with no space or arrangement for seats where readers could sit down and have even a look at books with ease and comfort.
- ★ Most libraries do not follow open access system.
- ★ In many libraries working hours are from 10 a.m. to 4 p.m. This is obviously wrong as the library should not close as soon as the lectures end, all university libraries should remain open for 12 hours a day for the seven days of a week. The library staff will naturally have to work in shifts and they will get their holidays by turns.
- ★ The library should have adequate and well-qualified staff. Each library requires categories of employees.

The Commission suggested three-tiered arrangement in a university library such as,

- (a) Librarian- having capacity of organizing and experience of management of library.
 - (b) Deputy Librarian– for different sections of the library like cataloguing, reference work, reading room management, etc.
 - (c) Assistants- helping in all activities including issuing of books.
- ★ Sufficient attention has not yet been paid to the reference service in the libraries of our universities. Lecturers and tutorials must be supplemented by work in the library. Reference assistants can be of help not only to the students but also to the teachers in their special subjects of study.
 - ★ The Commission strongly recommended that university libraries be greatly improved by:
 - (a) larger annual grants,
 - (b) introduction of open access system,
 - (c) longer hours of work,

- (d) better organization , and
- (e) a well-trained staff which should include references assistants.

If we apply these recommendations even today to the college libraries, we will definitely find an improvement in their services. If one compares the above cited objectives and functions with that of the situations of college libraries are not fulfilling the standards mentioned in the objectives. In this context, it is useful to observe the picture of college libraries as described by S.R. Ranganathan.

3.3 Status and Components of College Libraries

S.R. Ranganathan has given his opinion about college libraries over 30 years ago in following words: “College library consisted of closed cupboards. Most of them were concentrated in one or two rooms called general library. Hardly any student cared to go to the general library. A student could at best reach up to the barrier , select all by himself a title from tattered volume of printed catalogue , and drop an application form for it into a tray; one morning each week .By the evening ,the available books would all stand filled up on the desk . A lucky student might find his book in the pile but he would after feel disappointed by the book not suiting his standards or by its being something different from what he thought it to be!”

It has been pointed out by M.Bavakutti in 1983 that the situation as narrated by S.R. Ranganathan is more or less true even with regard to the present-day college libraries in the country.

The 21st All India Library Conference, 1985, has also emphasized the need for improvements in college and other libraries and information centers with immediate effect.

The Expert Committee on College Libraries appointed by Government of Kerala under chairmanship of V.P.Joy, Director of Collegiate Education, in

its report pointed out following factors as hindrance to the fulfillment of the objectives:

- (1) Teaching techniques that restrict the educational process within facts narrated and notes dictated in the classroom and confining studies to the letter of the textbook and the syllabus.
- (2) Lack of quality and relevance of book collections to the services offered by the library and actual reading needs of the students.
- (3) Lack of innovating atmosphere and lack of facility for study and references in the library.
- (4) Lack of awareness about library services available, books stocked and ignorance of information on search methods.
- (5) Inability of library staff to understand and cater to the information need of the students.
- (6) Poor organization of materials in the library and lack of catalogues, indexes and classified arrangement required for efficient book and information retrieval.
- (7) Opening hours not in conformity with out-of-class hours, and self-study timing of students.
- (8) Lack of facility for or initiative of the librarians to associate with or organize cultural and literary programmes, competitions, discussions, etc., and participate in the life of the campus.

After taking note of the opinion of S.R. Ranganathan and the report of Expert Committee on College Libraries in Kerala, it can be concluded that there is a change in the status of college libraries but it is very small. The situations in college libraries are to be changed drastically. There is growth only in respect of users, books and future college libraries are

having good buildings, etc., but unless these physical facilities are made usable for the readers, it cannot be said that the libraries are library develop equally. In this respect it will be useful to know the various factors or components of the college library.

For any library the sources of information are its raw materials, information is the product of its sources, user are the customers and the staff who links the information and the users is the mediators. Accordingly, while materials resources include books, periodicals and other non-book materials, equipment resources include furniture, audio-visual equipment, computer and other equipment used to know the contents of the document and human resources include staff.

Education was started by the two Christian Missionaries, Rev .James Herbert Lorrain (Pu Buanga) and Dr.Frederick W.Savidge (Sap Upa) who have arrived in Mizoram on 11 January 1894 under the Arthington Aborigines Mission from London. They developed Mizo Alphabets in Roman Scripts and started School in 1984 with two students. Mizoram recived tremendous blessings through the services of missionaries and now became the second highest literacy percentage of Indian states. The first College in Mizoram was established under the initiatives of the Welsh Missionaries in 1958 at Aizawl under the name of Aijal College (now, Pachhunga University College). The College Library started functioning in 1961 with Pu Lalmakthanga, the pioneer library staff in Mizoram, as Librarian –cum-College Clerk.

3.4 College Library Administration and Management

The authorities of a college may be (i) government (local, state or sometimes national) or (ii) Private individual(s) or corporate body. A trust or governing body is formed by the authorities to look after the college. A library committee is constituted for advisory or administrative purposes. It can serve a useful means of liaison between the teachers and the

librarian. In case, there are student representatives on the library committee, then the committee can serve as liaison between student community and the librarian. However, a library committee should be advisory in nature.

Libraries in Mizoram were under the Education Department until the department was trifurcated into School Education, Higher & Technical Education and Art & Culture departments in 1989. Since then, Art & Culture department had taken over Public Libraries and College Libraries by Higher & Technical Education department and as such Director become head of the departments

Colleges, at the time of its establishments, are supposed to start functioning of a library automatically. As the head of the college, all responsibilities for the administration of the library rest on him. Some colleges have a Library Committee and separate Library buildings, but some do not. The state Government has approved fees to be followed by all the colleges under its jurisdiction and fixed Rs. 50/- as Library Fee per student for one academic session. The state government is not having any separate library budget, and therefore, the primary source of finance is students' library fees and some financial assistance from UGC or other organization, which may differ from library to library.

The jurisdiction of Mizoram University is within the Mizoram State which defines that all the colleges within Mizoram are to be affiliated to the Mizoram University. The colleges affiliated to Mizoram University are given in a table but Theological Colleges are affiliated to Senate of Serampore.

Library Staffs

*** *Academic College Libraries***

Staffing is one of the important areas of management which is now popularly called as personnel management. Staff of any library can be of four types, namely:

- Professional,
- Semi-professional,
- Non-professional
- Technical

Professional staff consists of persons having degree or postgraduate degree in library and information science. Such a staff member can handle the library work independently by accepting responsibility. Librarian, deputy librarian and assistant librarian in a college can be included in this group. Semi-professional staff is a group of persons who are appointed as library assistants and library attendants. These persons generally possess diploma or certificate in library and information science. Non-professionals are the supporting staff members who perform the administrative jobs like typing, accounts, maintenance of files, correspondence, etc. The posts of accountant, senior/junior clerk, peon and the like can be included in this category. In addition to the categories of staff cited above, a library requires some technical persons too. Libraries possess information sources like films, cassettes, micro-films, transparencies, floppies and such other audio-visuals. So also, a library must have Xerox and other reprographic facilities. To operate these machines, one requires operators. Such operators of various machines can be included under technical staff required for the library.

For effective running of the library activities, not only a library requires sufficient number of staff, but each staff member is supposed to possess knowledge and ability to perform the given work. In short, right person is to be provided for right job. This is to be done by considering the

necessary situations and then proper number of staff is to be provided. Providing sufficient number of persons would not by itself achieve the success in gearing good library service. But, the person appointed should also know his/her responsibilities, duties and requirements of the institution. This can be called as 'job description'. It is expected that the management will provide job description for each post. Such a job description guides the person concerned as well as the supervisor so that he can get the work done efficiently. Unfortunately, neither the UGC nor the State Government accorded the required number of professional posts in the college libraries in Mizoram.

For providing job description it is necessary to analyze the various jobs and procedures in the library. This is called as 'job analyses. Further, it is to be decided that how much staff is required for it. Time and motion study is sometimes used for this purpose. However, the study could not be carried out for all jobs in the library. There are various service points where a minimum number of persons are to be provided without calculation of jobs, e.g., property counter, reading room, circulation desk, etc.

By giving the job description, a person will accordingly. However, to extract maximum work from the employee, one requires motivation, Motivation can be different forms but ultimately it increase of efficiency.

Thus in short, the areas of staffing can be summed up in following four categories:

- ◇ To provide proper number of qualified persons,
- ◇ To give job description,
- ◇ To provide job analysis or evaluation, and
- ◇ To suggest norms for motivation.

While studying the staffing formulas in college libraries it was observed that, these formulas suggest only number of persons appointed in libraries

but nothing is suggested about the remaining three aspects. Further, the formulas suggested do not satisfy needs of all types of college libraries.

The similar type of expression was observed by Shaila Creth. “. While it appears that personnel planning and utilization in libraries is still ad hoc in nature, the concern for better personnel planning was obvious in the list of improvements.

- ⇒ A consistent and comprehensive manpower system,
- ⇒ More formal planning and analysis,
- ⇒ Comprehensive projection of long-term staffing needs,
- ⇒ Information regarding staffing needs in relation to automated system-cost, productivity, standards etc.,
- ⇒ Manager’s knowledge of classification systems,
- ⇒ Skill inventory information,
- ⇒ Job enrichment and job redesign plans,
- ⇒ Staff development programme, and
- ⇒ System of rewards and incentives.

The minimum staff position of a college library should consist of 1 professional, 1 typist-cum-clerk and 1 attendant. In case the library has to be kept for longer hours, then more staff would be necessary. With such a limited staff, it would hardly be possible to offer variety of services, which might be considered desirable.

In order to provide reasonable level of services and also to keep a college library open for at least 12 hours, it is suggested that the staff should consist of 1 librarian (lecturer's grade), 1 Professional Assistant, 1 Semi-Professional Assistant, 1 Library Assistant, 1 Typist and 6 Attendants. In case, it is an extended college (having more than 1,500 students on its roles), then an additional staff of 1 Professional Assistant, 1 Clerk and 2 Attendants should be provided.

Library staffs in Mizoram Colleges are very few in numbers in comparison to other academic libraries of other Indian states but are of hardworking and dynamic in their services. Some of the College Libraries are managed by one library staff whereas some have two or three staffs. Out of the 25 (twenty five) college libraries, only 10 (ten) are look after by a Librarian whereas some are managed by the Library Assistant or a clerk. Besides, library staffs are engaged for the other official works in the college office which hamper the services of the library as a whole.

The State Government of Mizoram has adopted the UGC Revision of pay Scales for college teachers and other measures with effect from 1986 and thereafter, College Librarians are also given this scale of pay and now 10 (ten) College Librarians are getting their pay as per UGC revision of pay . This opportunity could happen only because of the opening of the Department of Library & Information Science in Mizoram University in 2002. Till this date, as much as 9 (nine) working college library staffs have been qualified for the post of college Librarian from this department.

3.5 Functions and Services

The following services may be provided in a college library so as to get the students abreast with latest information about the arrival of new book, journals etc.

- **Lending service**
- **Instruction in the use of the library**
- **Assistance in the location (or searching) of documents or use of library catalogue or understanding of reference books, etc.**
- **Readers' advisory service**
- **Provision of general or specific information**
- **Inter-library loan**
- **Compilation of bibliographies/indexing/abstracting**
- **List of additions**
- **Reservation of documents**
- **Reprographic service**

The users would mostly need fact and background type of information. Most often, they would be able to collect information on their own. Sometimes, they would consult the librarian. It is important that a librarian should devise means to bring additions to the library to the notice 'of students and teachers.

In practice, Indian college libraries usually provide lending service and other services are often found missing. Good reference service in college libraries in India is missing to a large extent. Most of the college students do not know how to make an effective use of a college library. The major problem is as how to provide instruction to students so that they succeed in using the library effectively.

Take for instance, orientation of a freshman; college libraries have not been able to do it effectively. May be the students do not think library instruction to be of much importance to their practical needs. They think they can get along without it because they use the library mainly for textbooks. Library instruction will become important if methods of teaching and examination are changed so that students are required to use the library resources heavily whereby reference service will get vitalized. This would also lead to setting of an active readers' advisory service.

The main objective of a library is to provide best services to the library users in the fullest manner within a least span of time. It is therefore necessary to adopt latest technologies in the library services. To develop and grasp such kind of technologies, it is very problematic for a single handed library staff. Further, some institutions have only one professional staff but some do not. The services which can be rendered by most of the college libraries in Mizoram are: Circulation, Reference and Periodicals services. Some college libraries can prepare bibliographies and conduct Current Awareness Services. Hrangbana College is the only one which is partially computerized and provided Internet Facilities for the library users.

Changing Philosophy of Education

In most of the colleges, teaching is examination-oriented based on 'teacher-classroom' approach. Present day philosophy of education is that teaching should be "student-resources -centered". Later approach leads to greater use of a college library. The concept of resources is concerned with the inclusion of documents such as tape records, video and audio cassettes, gramophone records, microfilms, maps, etc. Thus according to this approach, a college library is expected not only to acquire traditional types of documents but also a variety of new instructional aids.

Qualifications of Librarian

Librarian should possess a degree in library science and a master's degree in a discipline. He should possess imagination and initiative. He should have ability to work with students and others. He should have sound understanding of library administration and management. He should have interest and necessary understanding of the college programme and methods of teaching. He should show a high degree of performance, so that his services are appreciated by users and authorities.

Responsibility of Librarian

Usually, a college librarian would be the only professional working in the library. Therefore, he will be responsible for all professional jobs concerned with selection, acquisition, processing and servicing of documents. He bears a heavy responsibility. The success of a college library will greatly depend upon the capability of the librarian.

Building

Open access enables the users to achieve free access to documents. This is essential for encouraging reading. A library building must be planned to allow free access to documents. In addition stacks and reading

facilities must be intermixed. Thus, there should be no barriers between the users and documents. The users must get free access and be allowed to browse freely. Provision of proper lighting, Comfortable furniture, quiet and airy place will make browsing and reading stimulating. Provision should 'be made for new media, a computer and a reprographic machine.

Library Finance

Main Sources of Finance are library fee, state grants, UGC (University Grants Commission) grants etc. Kothari Education Commission (1964) had recommended that as a norm it (University/college library) should spend each year about Rs 25.00 for each registered student and Rs 300 per teacher. However, keeping in view rising prices of books and periodicals, it suggested that recurring grant should be Rs 60 per student and Rs 600 per teacher. Whenever a new subject is introduced in a college and new teachers are appointed then the library may be allocated a basic grant for the purchase of books and periodicals, at the rate of Rs 2,000 per teacher. As a matter of principle, book grants should be correlated with price index of books and periodicals.

Facilities

Library Facilities should be developed as a part of total programme of a college. In underdeveloped colleges, libraries need to be given special attention. An Indian context, many students do not have a proper place to read at home. Therefore, it is essential that a college library should be provided facilities for comfortable reading.

Collections

The collection of a college library should be a live one, able to meet the extent and nature of the curriculum. It should also adequately take care of extra curriculum materials as well as recreational reading material. However, in practice, many college libraries merely provide curriculum

and co. curriculum materials. This may be due to lack of financial resources.

Book Selection

Each department of a college should be allocated money for the purchase of material. Book selection aids and lists of books must be made available to teachers. Books received on approval should be examined personally by the teachers and decisions for purchase or rejection taken. The materials need to be selected with utmost care. In order to meet the requirements of users, it is essential to lay down a sound collection development policy.

For American libraries, there is *Books for college libraries* (1967). There is need for such a list for Indian libraries.

Processing

In Indian college libraries, usually *Dewey decimal classification* is used. Many of the libraries use *Colon classification*. For instance, in Mizoram College, *Dewey decimal classification* is used. Special college libraries prefer to adopt *Universal decimal classification*. Extensive literature has appeared on the only one schemes of library classification mentioned above. In order to decide choice for a scheme of classification, one should choose a scheme which is likely to meet the requirements of the users to a maximum extent.

Indian college libraries use either *Anglo-American cataloging rules* (1967) or S.R. Ranganathan's *classified catalogue code* (5th edition, 1964). Most of the college libraries prefer dictionary catalogue. Therefore, *an Anglo-American cataloging rule* is preferred. It may be added that very few college library prepare subject headings.

Use

Level and extent of the use of a college library would largely depend upon the following:

- ➔ Collection of the library
- ➔ Services provided by the library
- ➔ Type of curriculum
- ➔ Methods of teaching followed by faculty
- ➔ Attitude of the faculty towards role of library in teaching-learning process.

We may recognize the following levels of library use:

- ☐ Textbook level use
- ☐ Co-curricular level use
- ☐ Independent study level use
- ☐ Research level use

In Indian scenario, text-book level use is a predominant one. Co-curricular level use depends upon quality of teaching and level of students. Research level use is carried out by some of the colleges on a small scale by the teachers. This level of use is likely to increase in the years to come due to incentives being provided to teachers to go for research degrees.

3.6 Library Computerization

Library, centre of learning in every level of education, occupies the core of entity in formal and non-formal education systems. Fast growth in research and development in every field of studies requires technological competencies for the library personnel, to grasp and implement latest technologies in the form of automation and digitization for information storage and retrieval. Higher education institutions of Mizoram are also moving fast to grasp the latest technological developments to provide efficient library services. The following libraries , Which have being computerized their libraries used SOUL Software , developed by

INFLIBNET and other libraries are also procuring the same Software, Mizoram University is proposing to use LIBSYS Software for the computerization of its library which is supposed to start very soon . The Degree colleges affiliated to Mizoram University have been placed in the Table-2. The table shows steps taken up by the college libraries and other higher educational institution libraries for the computerization of libraries in Mizoram. Further, the list of Theological colleges, Mizoram has been placed in Table-3 showing the relevant information of the colleges including the status of library computerization. Moreover, the list of other institutions/ organizations offering Degree courses in Mizoram also has been reflected in Table-4 which reflects the overall information of the concerned organizations including the status of library computerization.

Table-2: Degree Colleges Affiliated to Mizoram University

Sl. No	Name of College	Year of estt.	Status	Courses offered	Profes-sional Staff	Library Compute-rization
1	Pachhunga University College, Aizawl	1958	Constituent (Mizoram University)	B.A; B.Sc; B.Com	1	Under process
2	Govt. Lunglei College, Lunglei	1964	Government	B.A; B.Sc	1	Under process
3	Govt. Champhai college, Champhai	1971	Government	B.A; B.Sc	1	-
4	Govt. Serchhip College, Serchhip	1973	Government	B.A; B.Sc; BCA	1	Under process
5	Govt. Aizawl College, Aizawl	1975	Government (B+)	B.A ; B.Com	1	Under process
6	Govt. Kolasib College, Kolasib	1978	Government	B.A; B.Sc	1	-
7	Govt. Saiha College,Saiha	1978	Government	B.A ; B.Sc		-
8	Govt.Hnahthial College, Hnahthial	1979	Government	B.A	1	-

9	Govt. Hrangbana College, Aizawl	1980	Government (B+)	B.A B.Com	2	Partly Computer-ized
10	Govt. Zirtiri Residential Science College, Aizawl	1980	Government	B.Sc; BCA	1	-
11	Govt. Lawngtlai College, Lawngtlai	1980	Government	B.A	-	-
12	Govt. Aizawl North College , Aizawl	1980	Government	B.A	1	Under process
13	Govt. J.Buana College, Lunglei	1983	Government	B.A	1	-
14	Govt. Mamit College, Mamit	1983	Government	B.A	1	-
15	Govt. Saitual College, Saitual	1984	Government	B.A	1	-
16	Govt. Khawzawl College, Khawzawl	1985	Government	B.A	-	-
17	Govt. Zawlnuam College, Zawlnuam	1986	Government	B.A	-	-
18	Govt. Aizawl West College, Aizawl	1990	Government	B.A	1	-
19	Govt. Johnson College, Aizawl	1992	Government	BA	-	-
20	Govt. J. Thankima College, Aizawl	1992	Government	B.A	1	-
21	Govt. T.Romana College, Aizawl	1992	Government	B.A	1	-
22	Kamalanagar College, Chawngte	1992	Private	B.A	-	-
23	Lunglei Morning College, Lunglei	1993	Private	B.A	-	-
24	College of Teachers' Eduatioal, Aizawl	1975	Government	B.Ed.	1	Under process
25	Mizoram Law College, Aizawl	1983	Private	L.L.B	1	-

Table-3 : Theological Colleges

S. No	Name of College	Year of Estt	Organization	Courses offered	Professional Staff	Library Computer-ization
1	Aizawl Theological College, Aizawl	1907	Presbyterian Church of Mizoram	BD.; M.TH	2	Under process
2	Academic of Integrated Christian Studies, Aizawl	2001	Baptist church Mizoram	BD.; M.Div	1	

Table-4 : Other Institution/ Organizations Offering Degree Courses

Sl. No.	Name of institutions	Year of Estd.	Organization	Courses offered	Professional Staff	Library Computer-ization
1	DOEACC, Aizawl Centre	2001	Ministry of Communications & IT (GOI)	BCA*	1	Partly Computerized
2	Regional Institute of Para-Medical & Nursing Science	1995	NEC (GOI)	B.SC(N);* B.Sc (MLT);* B.Pharm*	2	
3	Mizoram College of Nursing	2005	Government	B.Sc(N)*		
4	ICFAI National College, Aizawl	2005	Private	BBA	1	
5	Mizoram Hindi Training College, Aizawl	1975	Government	Parangat (B.A); pravin (B.Ed)		

* Courses affiliated to Mizoram University.

3.7 UGC Initiatives for College and University Education in NE Region

The Government of India is all set to provide all kinds of support for overall development of this region as is evident from the visit of Hon'ble Prime Minister to Manipur on 20th November 2004. As a follow up of the Prime Minister's initiatives to facilitate sustained development of the North Eastern States and in view of the interaction and discussions held with Governors and Chancellors, Chief Ministers, Education Ministers, Vice Chancellors and Senior Academic of the Universities and Colleges in the North Eastern region, a 14-Point Action Plan was prepared for the comprehensive development of the College and University Education in these states. The University Grants Commission in its meeting held on December 24, 2004 approved the proposed Action Plan for immediate implementation. Some of the Action plan points worth mentioning relating to this topic are as follows:

1. The Minister of state for Higher and Technical Education, Mizoram, submitted proposal forwarded by MHRD for the infrastructural development of colleges and institutions in the State which include the request for assistance of Rs. 30 crores for the development of colleges in the State. The University Grants Commission may provide a special package for the development of the colleges in the North East States including for the construction of buildings, laboratory equipment and teaching aids over and above the existing allocated funds. The Commission may consider providing assistance to those colleges as well are yet to be covered under 2(f) and 12(B).
2. INFLIBNET may be requested to take up computerization of all the college libraries of the colleges in North – East States. The software developed by INFLIBNET may be given to all colleges.

3. Assistance to all the colleges under 2(f) and 12(B) may be provided under its various scheme of Computer Network Resource Centre.
4. UGC should take pro-active role for providing assistance under its various schemes to all the colleges which are yet to be covered under 2(f) and 12(B) as a special case including –
 - ☛ Development grants
 - ☛ Grants for women's hostel
 - ☛ Career Oriented Courses
 - ☛ Development of Post Graduate courses
 - ☛ Special grants to the old reputed Colleges
 - ☛ Minor Research Projects, etc.
5. The Universities in all the North Eastern States may be provided special assistance for development of their infrastructure.

3.8 Role of INFLIBNET

Information and Library Network (INFLIBNET) establishment by UGC have a clear mandate to modernize the college libraries in India. Modernizations primarily encompass library Automation and Networking since college libraries in the North Eastern Region in general and Mizoram in particular because the North-Eastern States are located in remote areas. Most of the states are also located in the hill stations including Mizoram and many of them also are inaccessible. Under these circumstances, automation and networking are the boon to these libraries. This will further have an effective linkage with INFLIBNET Databases and other services for the greater benefits of its users. It is suggested that INFLIBNET on a war foot base is should undertake the following measures for the development of college Libraries of North Eastern Region.

- Procurement of Hardware and Telecommunication facility.
- Procurement of Library Software.

- Retro conversion including MARC-21.
- Bar-coding Technology.
- Benefits of UGC Infonet, E-Journal Consortia.

Besides, training on Automation and Networking on the above areas plays a very important role. If some of the libraries have procured Hardware, they do not have Software. Few of the libraries have both; they do not have hands –on experience staff to undertake the Automation and Networking activities. Therefore, it is suggested that INFLIBNET should undertake to modernize these libraries in phase manner so that these libraries could come at par with other libraries and also facilitate easy access and exchange of information among the colleges, Universities, and other R& D institution in India through INFLIBNET databases.

Mizoram, having 25 recognized colleges and second highest percentage of literacy rate in India, is lagging behind to meet the higher educational requirements in terms of library automation & networking. Institutional Libraries in Higher Education are not even equipped with their basic requirements for development in terms of trained professional staff and equipments. Students and faculty members in college greatly in need of acquiring latest information in different fields of studies can cater their educational/ curriculum requirements. Henceforth, Institutional authorities, state government and INFLIBNET (UGC) may take up keen interest to start and promote library automation& networking for Mizoram Colleges. Mizoram College Libraries can move ahead to develop and strengthen educational information to help the students, research scholars and teachers to cater their thirst in gathering information of different kinds through Libraries and Information Centers. Library computerization and networking could form a strong base to create, develop and maintain library website and digitization of library materials and e-resource as well.

There is a need for defining the role, powers and responsibilities of a college librarian. The composition, functions and role of the library committee should be laid down in the statutes.

The financial support provided to college libraries is insufficient for providing variety of services required to meet the demands of students and teachers. Recurring grant should be provided at the rate of Rs. 60 per student and Rs. 600 per teacher. For a new subject, basic grant for books and periodicals at the rate of Rs. 2,000 per teacher should be provided.

In order to meet the changing needs and demands of present and the future, it becomes essential to lay down a sound collection development policy. In order to optimize the use of a college library, it would be useful to educate the users of the library in the use of the library. For this purpose user education programmes should be set up.

In order to provide reasonable level of services and also to keep a college library open for at least 12 hours, it is suggested that the staff should consist of 1 librarian (lecturer's grade), 1 Professional Assistant, 1 Semi-professional Assistant, 1 Library Assistant, 1 Typist and 6 attendants. In case, it is an extended college (having more than 1,500 students on its rolls), and then an additional staff of 1 Professional Assistant, 1 Clerk and 2 Attendants should be provided.

Library services need to be strengthened. Reference and information services should be given more attention. Bibliographies and indexing services should be provided. Inter-library loan should be provided not only to teachers but to students also. Libraries should go for resource sharing among college libraries and with other libraries.

In order to evaluate library services provided by a college library, a library survey may be carried out from time to time by an outside library expert(s). In case, it is not possible to employ an outside library expert, a

self survey may be carried out two or three times during the academic year.

3.9 CONCLUSION

The college libraries, with a few exceptions have been unable to provide adequate collections and services to meet the requirements of the users effectively. Thus, these have been found inadequate as instrument of instruction. What are the reasons for this state of affairs? The blame should also go to the authorities, who have shown apathy towards college libraries. Had authorities been alert, then libraries would have been put under pressure to improve the situation. On the other hand, the role of librarian has neither been well defined nor given due recognition.

In order to build up adequate libraries, it is essential to provide adequate funds so that libraries can recruit suitable staff and set up live collections, able to meet the extent and nature of curriculum as well as adequately take care of demands for extra curricular and recreational reading materials. Book selection should be a joint responsibility of librarian and teachers. The librarian must attempt to restrain teachers from making unwise selection and to keep within the financial allotment.

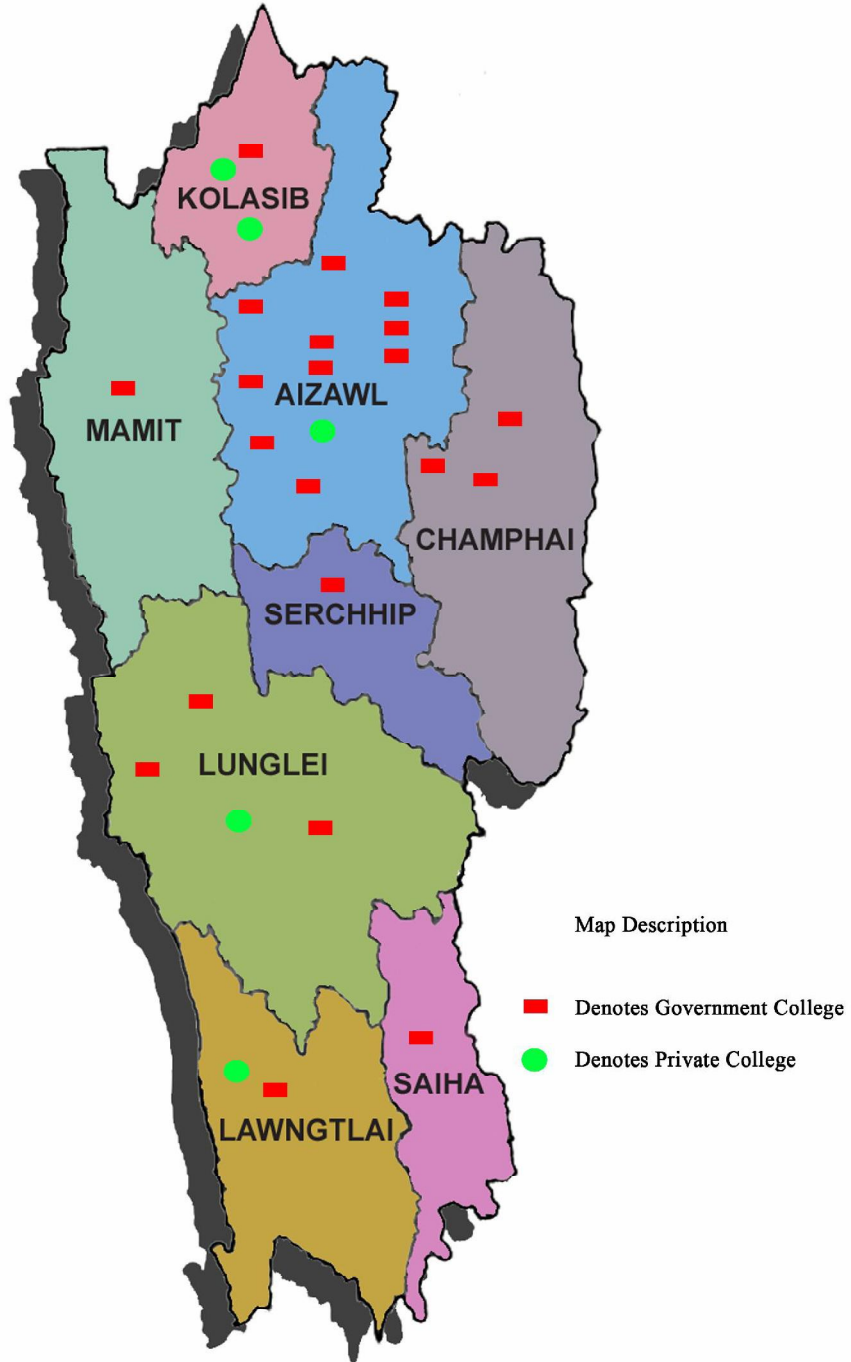
Provision of services is far from satisfactory. These needs to be extended so as to optimize the use of the library. Reference and information service should be strengthened. Reprographic services have been started in some colleges. Each college should have a reprographic machine for providing reprographic service on subsidized rates.

No library can afford to be self sufficient. Therefore, resource sharing must be given due importance. College libraries in a given region should form linkages among themselves to share resources. They should also have linkages with other libraries especially libraries attached to institutes of higher education.

Library standards should be set by UGC and college libraries must be expected to follow these strictly. UGC is taking necessary steps to lay down standards. As a norm, no college should be established without a library and a properly qualified library staff. As far as possible, teaching should be built around resources available in the library. This also puts a responsibility on the library to develop a well rounded collection to serve the needs of students, teachers and research scholars, if any.

From the above discussions about the college library scenario in Mizoram, it could be assessed that, library automation, networking are the need of the hour so as to facilitate the users with right and authentic information including a vast array of filtered information through the libraries. The succeeding chapter-4 deals with the relevant area entitled “Adoption of Information and Communication Technology (ICT) in College Libraries of Mizoram” so as to make the library as a viable platform for the users to access information.

Map No. 1 : Showing Location of Colleges in Mizoram



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Chapter-4

**ADOPTION OF ICT IN COLLEGE
LIBRARIES OF MIZORAM**

4.1 Introduction

The Library and information Centers are increasingly being called upon to provide more relevant, up-to-date and timely information to a wide range of users. To satisfy the varied needs they require availability and accessibility to a variety of information resources and formats. The libraries, like those in most developing countries, suffer from inadequate funding or stringent budget cuts. This has affected the level of services offered to users both in terms of quality of collections and the degree of staff support provided. In the present circumstances only a few libraries can afford to have a wide range of information resources within their budget. The situation calls for change in the approach and to be wiser or cost-effective to avoid duplication of information resources among the libraries in the country and leads to sharing of resources using co-operative purchase through consortia approach.

The electronic resources, which are available in libraries today is an outcome of the advances in both computer technologies, with powerful computers the information storage and delivery mechanisms, such as CD-ROMs and user friendly interfaces. In most of the academic libraries in the western countries, Online Public Access Catalogues (OPAC's) have almost replaced card catalogues, offering enhanced search capabilities for accessing the local collection and often expand coverage to include the holding of other area or regional libraries. Many libraries also provide a web interface to their library and information system. The library and information system with a web interface often includes direct links to electronic journals, books and Internet resources.

The information and communication Technology (ICT) options available to libraries have increased considerably during the last few years requiring them to consciously evaluate the different options before investing in hardware, software, and other information and communication technology products and services. The impetus for adoption of new technologies by

libraries has come from within organizations in which libraries function as well as from external agencies, e.g. The University Grants Commission (UGC) under the INFLIBNET programme and the Dept. of Science and Technology under the NISSAT programme.

Justification for Adoption of ICT in Libraries.

The main reasons why libraries in general seek the application of ICT solutions are to

- ➔ Obtain increased operational efficiencies.
- ➔ Relieve professional staff from clerical chores so that they are available for user-oriented services.
- ➔ Improve the quality of services.
- ➔ Provide new services not hitherto possible.
- ➔ Improve the management of their physical and financial resources.
- ➔ Facilitate wider access to information for their clients.
- ➔ Facilitate wider dissemination of their information products and services.
- ➔ Enable their participation in resource sharing library networks, and
- ➔ Enable rapid communication with other libraries (including outreach libraries) and professional peers.

The above mentioned reasons are not mutually exclusive. Benefits of the application of ICT have been known to have spill over effect. Also it is well known that a library beginning with one application and reaping the benefits there from soon begins to look for other areas where ICT solutions are possible and useful.

It is essential, however, that a library seeking ICT solutions should crucially examine the above mentioned reasons and prioritize these taking into account the context in which they are working. A college library may need to give higher priority to automating its circulation system and expanding its capacity for interlibrary loans. As strategy, the prioritization of the above mentioned reasons why ICT should be applied should be done in consultation with the user community, management of the organization and the library staff- the stake holders. This could be done in a structured manner in one or more formal meetings with representatives from the stake holders where their views are sought, with library staff providing the background papers, facts and figures, on which informed discussion could be based. Such a prioritization exercise would help in building awareness among the stake holders and in obtaining the explicit concurrence of important players in seeking relevant ICT solutions. This would pave the way for the next steps in the adoption process.

4.2 Library Networks: Meanings, Need and Objectives

The development of sophisticated technologies in computer and communication field has upset libraries world wide in storing and transmitting information. The computer and its communication circuits link to other computer or to terminals constituting an integral information machine. This technology introduced the 'Network System'. When a group of libraries using computers decide to exchange information, a network is developed. The National Commission on Libraries and Information Science (NCLIS) in its National Programme Document (1975) defines a network as:

"Two or more libraries and/or other organizations engaged in a common pattern of information exchange, through communications, for some functional purpose. A network usually consists of a formal arrangement whereby materials, information and services provided by a variety of

libraries and other organizations are available to all potential users. Libraries may be in different jurisdictions but agree to serve one another on the same basis as each serves its own constituents. Computer and telecommunications may be among the tools used for facilitating communication among them".

According to Martin, "A network is a group of individuals or organizations that are interconnected. The linking must include a communication mechanism, and many networks exist to express the purpose of facilitating certain types of communication among their members. In the library world, institutions form networks primarily to achieve better sharing of resources – resources consisting of bibliographic information and of collection – and better services to patrons". It must be emphasized that the particular focus in this gathering will be on online networks, those using computers and linking members to the computer resources by means of telecommunication connections.

A library network is a description of an activity which existed before the term itself was devised. When any two libraries talk to each other, we have the fundamental condition for networking that is exchange. When one library provides service to another, we have the rudiments of network behavior. Inter-library loan or bibliographic exchange in any form is the chief justification of a network.

Networking is a system with a predominant flow of service and a reverse flow of demand. When a librarian asks his neighbour for a book or a citation and his request is honoured networking begins. Librarians now tend to view a collection as not merely what they possess in their institution, but all materials they have access to through photocopying, inter-library loan and reciprocal borrowing privileges.

A typical network (though various models) looks like

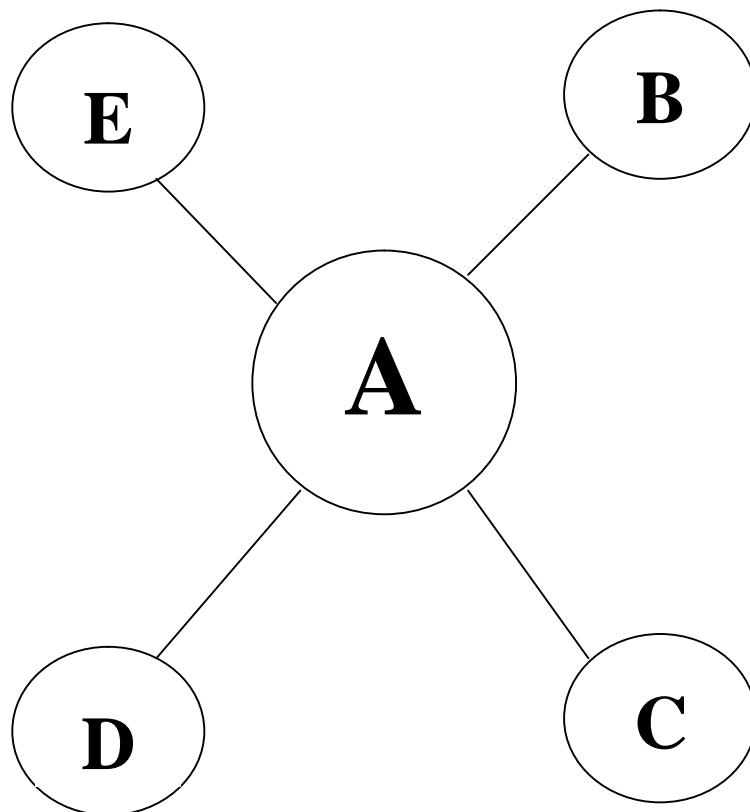


Fig. 1- A Typical Network

Where A, B, C, D, E are participating libraries, the central node (A) has the responsibility of maintaining and operating the centralized databases. In such environments, the participating libraries have the obligations to contribute all the bibliographical data pertaining to their respective collection to the central node. The libraries may be linked through telephone lines or through satellite depending upon the situation. In whatever way, they are connected the most important issues in such a network are related to creation, maintenance, and operation of centralized databases.

So on the basis of above explanations; we notice that library networks have the following characteristics:

- Data - Bibliographic Records (MARC) frequently

- ☛ Retrieval - Author/title/number (subject) (keyword)
- ☛ Access - Telecommunication network / Private Network / Hard wired Network
- ☛ Users - Librarians (Public)

The above classification shows that library networks have the following features:

- ⇒ One type of data
- ⇒ Committed user base
- ⇒ High Professional needs
- ⇒ Low end-user needs

Networks enable librarians, faced with clients' information needs beyond their local resources, to identify and obtain materials and services for those clients. As we move increasingly into electronic information era, we see technology and networks working together to reduce the physical movement of materials.

4.2.1 Need for Networking

As a universal phenomenon, libraries the world over are facing two major problems. These are:

- Information explosion
- Price escalation of library documents
- Increased cost of library services

The number of publications in various disciplines, especially in Science and Technology is alarming. It is estimated in the past that the primary source of literature in the field of Science and Technology is doubling in every 15 years whereas it now doubling in 10 years. According to UNESCO statistics of World Book Production, about three lakh books are published every year. The number of learned journals in the field of

science and technology alone has now come to the tune of 60,000 adding at the rate of 1000 journals a year approximately.

Another important problem the librarians/information professionals are facing is the constant increase in the prices of library documents. Since Indian libraries have to depend mainly on foreign publications, especially in the case of science and technology journals they have to face sharp increase in the rates of subscription and downward changes in the value of rupees. This hydro-headed problems have forced the librarians and information specialists to cut down the number of journals they procured to manage the situation within the available resources.

Another problem is increasing cost of library services as costs of library services have skyrocketed, libraries have realized that through cooperative arrangement there is the possibility of providing new services whose cost would be spread over many institutions. The concept of cooperation proves much effective and satisfies the user needs in a better way.

Thus, we notice in order to find a solution to the problems faced by libraries/information centers regarding information explosion and costs, library networks have been established for cooperation and resource sharing among libraries so that one individual libraries may not feel burdensome while handling vast amount of information and price escalation of library documents and services.

4.2.2 Aims and Objectives of Library Networks

The basic purpose for creating a network is to provide information services to member libraries through sharing of resources of the participating libraries of the network. This may lead to member libraries to depend more on access to documents held in the other member libraries

than on depending only on their respective collection. The main aims and objectives of library network are stated as the following:

- ◆ To promote resource sharing and co-operation activities among libraries by providing efficient and reliable means of resource sharing, e.g.
 - Inter library loan for maximum use of resources
 - Document Delivery Services – providing the copies of the document what is not available in their respective libraries
 - Manpower training and refresher course facilities – stimulating, promoting and co-ordinating research and training programme for library staff and network members
 - Access to national and international databases
 - Communication link through publication and inter-personal communication.

- ◆ To improve resource utilization and service level at the individual libraries by providing automation facilities in the following areas:
 - Acquisition and fund accounting
 - Cataloguing – assist member libraries in cataloguing of books, serials, non-book materials and catalogue production
 - Serials control
 - Circulation
 - User services – implementing electronic services in the libraries for fast communication of information

- ◆ To coordinate efforts for suitable collection development and reduce unnecessary duplication wherever possible. The purpose is
 - To develop collection by mutual cooperation
 - To reduce the operational cost of the collection development
 - To control the rate of rising cost of the collection development

- ◆ To establish referral centers to monitor and facilitate catalogue search and maintain a central on-line union catalogue of books, serials and non-book materials of all the participating libraries.
- ◆ To develop a specialist bibliographic database of books, serials and non-book materials for search and access.
- ◆ To create a database of projects, specialists and institutions for providing online information services.
- ◆ To coordinate with other regional, national and international networks for exchange of information and documents for the use of libraries and users.
- ◆ To evolve standards and uniform guidelines in techniques, methods, procedures, hardware and software, services and so on and promote adoption in actual practice by all libraries, in order to facilitate pooling, sharing and exchanging resources and facilities towards optimization.

4.3 Library Networks: Indian Scenario

Library and Information Network in Indian scenario has been discussed in detail for a clear understanding of the phenomena.

Networking: In Indian Context

Libraries are storehouses of information and knowledge. In this modern world, access to information holds the key to development. The rapid and exponential growth of information has made it necessary for librarians and information scientists to employ new techniques to cope with the massive proliferation of literature in all subject's fields. Research in the science and social sciences has led to high productivity in document publications. To bring this vast amount of information under bibliographic control and to

render it useful and accessible to potential users is a task of great magnitude which the information people face. So through the application of communication techniques and electronic data processing, library and information centers have now begun to realize the need of computers and associated facilities as indispensable for steady and accurate storage, processing, retrieval and dissemination of information and above all sharing resources among libraries.

For libraries to use their resources more efficiently and effectively for the users is a great task. This task can be solved to a great extent by resource sharing and cooperative functioning among libraries. And for this, networking of libraries, applying latest modern techniques is a must.

In India, networking of libraries is even more necessary than in the developed nations. The following important factors that may be considered for networking of resources (Libraries holding resources) in India as:

- ⇒ It is not possible for all the organizations and agencies to design a system to cater to its resource needs because their main aim is to provide resources rather than designing the system for providing resources. So they have to purchase an appropriate latest system to cater to their needs. Generally, it is very difficult or rather impossible to find a system which could entirely satisfy its needs. In India, manually such technologies are purchased from abroad and afterwards people face a number of maintenance problems. So while opting for networking, annual hardware maintenance, some initial training is required.
- ⇒ The cumulative collection of scientific serials held by many important libraries in India is quite poor when compared to USA, UK and other developed countries while in India, some libraries have a very good collection, and the majority of libraries suffer from very

inadequate collection. There is a great need to consider the entire resources of the country as a single entity that can be available to the entire user community of the country. Networking the libraries is the best way to make resource sharing very effective in order to ensure equitable availability of required information.

- ⇒ Literature being generated as a result of research activities being carried out is doubling every five years. Over 10 million journal articles are published every year besides news items, editorials and articles appearing in popular print media. It is not possible for all the libraries and information centers to acquire all the bibliographic material at one place due to storage problem as well as paucity of funds. Even to maintain a reasonable level of acquisition of journals, books and reports, calls for heavy budgets in libraries. Therefore, networking with other institutions, libraries, information centers, etc. is easy and economical way to get what a particular center does not have in its capacity.
- ⇒ Budget of the libraries/information centers/institutions and restriction on staffing has also forced institutes to opt for networking in the country and this is on the increasing trend. As for example, it is not possible to give a laser printer to each individual in many of the organizations, so best way to provide printing facilities to each of them is put the printer in the network and let all the computers users share it by way of networking operating system.

Similar methods also can be adopted to share other hardware resources like Modem, CD-ROM drive, etc.

India is a vast country with caste, cultural and linguistic diversities. Planning for their development is done at the center only. Planning for such a big country by sitting in the capital requires an extremely fast flow of information from all parts of the country to the center. This can be done

effectively by networking all the information centers in the states with the center. Poor infrastructure is a hindrance in this flow of information. With the introduction of better telecom facilities like optical fibers, satellite communication, powerful computer, this is likely to increase but still many parts of the country do not have these facilities.

Because of the above mentioned reasons, resource sharing and cooperative functioning through networking have become inescapable for libraries and information centers in this country.

4.4 National Efforts and Status of Networks

→ National Efforts

There have been many attempts in the country in the last two decades in computer application to library and information activities. During last so many years, libraries and information centers have become more earnest to computerize their operations and services. NISSAT (National Information System for Science & Technology) was once upon a time instrumental in promoting an integrated approach in library automation in the country, the efforts was by and large, at the institutional level. Some of the major organizations engaged in computerized information handling are:

- BARC - Bhabha Atomic Research Centre, Mumbai
- DESIDOC - Defence Scientific Information and Documentation Centre, Delhi
- DRTC - Documentation Research and Training Centre, Bangalore
- IISc - Indian Institute of Science, Bangalore
- IIT - Indian Institute of Technology (Delhi, Chennai, Kanpur, Kharagpur, Mumbai, Guwahati)

- NISCAIR - National Institute of Science Communication and Information Resources, New Delhi
- NIC - National Informatics Centre, New Delhi
- PRL - Physical Research Laboratory, Ahmedabad
- TIFR - Tata Institute of Fundamental Research, Mumbai

Besides the above, University Grants Commission (UGC), Department of Electronics, Department of Telecommunication, Planning Commission and other various Departments of Government of India have also been engaged in establishing various networks. There are possibilities of mounting bibliographical databases on these networks for providing online access-to-access.

The growth of Indian Library Networks may be traced to the efforts made during the last forty years and this has been depicted in Table-5. The chronology is given below.

Table-5: Growth of Indian Library Network

Year	Description
1958	1958 Scientific Policy Resolution. It was adopted at the instance of Pt. Jawaharlal Nehru. It emphasized the fostering of scientific temper in people. In pursuance of this agenda, several committees and commissions were appointed to look into specific issues and come up with necessary recommendations.
1959	Sinha Committee Report
1965	Ranganathan Report to University Grants Commission (UGC)
1972	V A Kamath Report
1977	Establishment of NICNET by NIC (1975)
1983	Technology Policy Statement. It emphasized the need for a technology information base.

1984	Working group of the Planning Commission headed by Dr N Seshagiri recommended to the govt. the need for modernization of library services and information during Seventh Five Year Plan (1985-90)
1986	NISSAT initiated the establishment of CALIBNET, Calcutta
1988	The National Policy in Library and Information System submitted in 1988. It recommended using of information technology on a national level.
1988	The UGC established INFLIBNET
1992	NISSAT supported the establishment of DELNET, DELHI
1993	NISSAT supported the establishment of ADINET, Ahmedabad.
1993	INSDOC supported the formation of MALIBNET, Chennai.
1994	NISSAT supported the establishment of MYLIBNET, Mysore
1995	NISSAT supported the establishment of BALNET, Bangalore

4.4.1 Planning Commission Efforts

The Planning Commission, Government of India, has been taking considerable interest in library resource sharing and library networks. Its efforts in these areas have increased since the Seventh Five Year Plan covering 1985-90. The Commission appointed a working group on modernization of Library Services and Informatics in November, 1983. In July 1984, the working group submitted its report. It recommended among others, interlinking of library systems through library networks. This report was to be considered for the Seventh Plan. The Commission appointed another Working Group which submitted its report in May, 1989. It again recommended among others interlinking of library systems in the country. The Planning Commission appointed in Feb, 1995, a Core Task Group to prepare an approach paper for enhancing inputs of Science and Technology for library resource sharing.

The Commission again constituted a working group on Libraries and Informatics under the Department of Culture, Ministry of Human Resource Development, and Government of India, which report was to be considered for the Ninth Plan for the period 1997-2002. The report of the Working Group of the Commission includes many important recommendations for the networking and modernization of libraries in the country.

All these initiatives by NISSAT, UGC, Planning Commission and other departments of Govt. of India have led to increased efforts to the establishment of library networks and library automation in the country.

Networks in India

Current computer Networks in India can be decided into three categories:

Networks connecting Educational and Research Institutions all over the country

ERNET – Education and Research Network

It was launched by the Department of Education (DOE), Govt. of India in late 1986 with financial assistance from UNDP (United Nations Development Programme) to provide academic and research institutions with electronic mail facilities. It is currently used by DSIR Labs, research centers and academic institutions.

SIRNET – Scientific and Industrial Research Network

It was established by INSDOC in late 1989 to interconnect all the CSIR laboratories and other R&D institutions in India. Its main objective is to harness the vast S&T information resources available with national laboratories and inculcate the habit of resource sharing among themselves. Its ultimate aim is to link the entire scientific community of the

nation with the national library system and the international links to achieve efficient scientific communication.

OPNET – Open Education Network

Open College Network – Many institutions are venturing into the field of education and are offering professional and technological courses by using communication technologies. They are using television, computer communication, email and network to reach the students. Indira Gandhi National Open University (IGNOU), which is an apex body for open and distance education, is engaged in the task of developing a network of open universities in India called OPNET. This is a network of physical, intellectual and academic resource organized under the aegis of the Distance Education Council (DEC), an independent arm of IGNOU and distance education in India. All the open universities are partners of OPNET. The resources that are pooled together include academic programmes, norms and sharing programmes, delivery mechanisms and interactive software for student services. The OPNET will be an umbrella network with the subnet of every partner college for delivery of their own courses.

Networks connecting the libraries in the country

- ⇒ INFLIBNET – It was established by UGC in 1988 and its operations began in 1991. It is a network of University and college libraries. It has also provided financial assistance to a large number of college libraries in India.
- ⇒ CALIBNET – Established by NISSAT in 1986, it was primarily concerned with for establishing a network of scientific libraries in Calcutta. At a meeting in 1986 in Calcutta, DSIR initiated action for preparation of a feasibility study for networking about 40 libraries in Calcutta. CALIBNET was the first library network visualized. At

present, it has now become the center for CD-ROM databases which are acquired from outside sources. Libraries can access these CDs. The basic purpose of the library network is to share the resources available in participating libraries. However, no resource sharing is done as there are no union catalogues prepared. This activity is however, in progress.

- ⇒ DELNET: It was established in 1988 by India International Center with the initial financial support of NISSAT and later officially registered as a society in June 1992. Its main objective is to promote sharing of resources among the libraries located in Delhi and outside Delhi. It is the first operational library network in India.
- ⇒ The other networks which are functional in India in the field of Library and Information Science have been mentioned below.
 - PUNENET in Pune in 1992
 - ADINET in Ahmedabad in 1993
 - BONET in Mumbai in 1994
 - MYLIBNET in Mysore in 1994
 - BALNET in Bangalore in 1995

All these networks are supported by NISSAT. They have not, as yet, created their value added databases such as union catalogues, though work is in progress. They are, at present, mostly offering Email and CD-ROM facilities. In addition to the above networks, the following networks are also included in the discussion.

NICNET

It was established by National Informatics Centre (NIC) in 1977 and started in the late 87's. It was launched basically for getting and providing information from/to district levels to facilitate planning process. It links for regional nodes at Delhi, Pune, Bhubneswar and Hyderabad and has

established 32 nodes at state and union territory levels and 439 nodes at district headquarters. By 1991, NICNET has achieved success in the creation of databases and networking. It also provides E-mail and other facilities to users using its already existing infrastructure.

INDONET

India's first data communication and computer network was started in March 1986 by CMC Ltd. It was launched as a solution to the growing need for providing timely well processed data to various institutions. In the First phase, they have mainly networked Mumbai, Calcutta and Chennai. Later, Delhi and Hyderabad were also linked as additional stations. INDONET presently has an international gateway which provides access to world wide packet switched networks like USA's Global Networks Systems (GNS) and Internet.

Present Scenario of Library Networking in India

The present status of library networking in India is that most of the libraries covered by some network are creating databases of their holdings and in automating the library activities. Generally, the periodical holdings are attempted first in building up the databases as it takes less time than for the other types of library documents. This is followed by the databases of holdings of books, reports, dissertations, standards, etc. The Library Network Centers, i.e., the coordinating agencies of the networks also are concentrating on acquiring them to provide the user with access to the total records. They provide such access either by email or online through the telephone network. In addition, these centers also try to provide common software for database development and automation of library activities and services.

Table No. 6 below gives the details of status of some important library networks in the country.

Table-6: Status of important Library Network

Name	Year of Starting	Promoting Agency	Whether registered as a society	Database development & other activities
ADINET (Ahmedabad)	1993	Society, INFLIBNET & NISSAT	Yes	<ul style="list-style-type: none"> • Library holding database in progress • Library automation in progress • Training programme • Database of current periodicals in member libraries
BALINET (Bangalore)	1995	NISSAT	Yes	Activity will start after getting financial support from NISSAT
BONET (Mumbai)	1994	NCST & NISSAT	No	<ul style="list-style-type: none"> • Online union catalogue of periodicals • Online request system for ILL • E-mail and Internet access • Online searching of foreign database • Database on computer and as are software • CD-ROM database searching • Database of contents of Indian periodicals • Software for OPAC
CALIBNET (Calcutta)	1992 (1986)	NISSAT	Yes	<ul style="list-style-type: none"> • Library automation in progress • Access to Internet and Dialog • CD-ROM database searching
DELNET (Delhi)	1990 (1988)	Society, NIC & NISSAT	Yes	<ul style="list-style-type: none"> • Books database • Multi-lingual book database • E-mail service • Union list of current periodicals • Database of Indian specialists • Online searching of

				foreign databases
INFLIBNET	1991 (1988)	UGC	Yes	<ul style="list-style-type: none"> • Union catalogue of 50,000 records • Database of periodicals (30,000 records) • Contents with Abstract Services (COPSAT) • Training programme for college library staff
MALIBNET (Chennai)	1993	Society & INSDOC	Yes	<ul style="list-style-type: none"> • Current serials database • Journal contents database (1,00,000 records) • All INSDOC databases on MALIBNET • Automative engineering database (4,500 records) • Access to Internet and Knight Ridder (Dialog) database • CD-ROM database searching
MYLIBNET (Mysore)	1994	Society, Mysore Library Consotium & NISSAT	Yes	Library automation in progress
PUNENET (Pune)	1992		Yes	

However, this scenario networks doesn't provide a growth of ideal library networks in India.

From the above table, it can be seen that except DELNET and INFLIBNET, most of the other library networks have yet to develop databases of library holdings in a significant way. Even these two networks have to go a long way, to cover in their databases, the entire holdings of all the participating libraries. Unless this is achieved, the networks would not be able to achieve significant resource sharing as well as rationalization in library acquisitions. Most of the networks are,

however, making efforts towards this end by conducting training programmes for the staff of the participating libraries in data capturing, database development and automation of library activities and services.

Networking of Public Libraries.

The public libraries in the west have developed into true community information and reference systems with such computerized data access and facilities for providing a variety of information to the general public from housing and social security to legal and medical aid and temperature and travel schedule.

In India, development of public libraries has not been a priority and their growth as a result has been uneven. Public libraries which could serve as the backbones of literacy mission, suffer for want of adequate funds, trained staff, modern equipment, good and adequate collections, proper reading rooms and stacking and user facilities. In order to provide to the public, access to the latest information and educate them, public libraries have to be technologically advanced so that they have access to INTERNET and international databases and networks.

According to UNESCO public library Manifesto 1994 (Revised) "The public library acts as a living force for education, culture and information and as an essential agent for the fostering of peace and spiritual welfare through the minds of men and women". The Manifesto recommends that, "The public library network must be designed in relation to national, regional, research and special libraries as well as libraries in schools, colleges and universities".

So there is a need to establish a public library network which is in conformity with the other networks in the country. Due to lack of up-to-date, actual number of public libraries could not be ascertained; however, nearly about 60,000 exist in the country. They can't be called libraries in the real sense as most of them are simply reading rooms. Most of them

are without computers and the librarians working in the distances in general, are not conversant with the application of computers in libraries. Training of library staff in the computer applications for library operations and services becomes one of the basic requirements of automation and networking.

In the rural areas, rural settlement are generally scattered and their libraries are neither up-to-date nor well staffed. Since the level of users is not of a high standing and also various problems in information infrastructure, it is not possible in the first phase to connect rural libraries with the public libraries network for networking purposes. However, with the wide use of telecommunication technology, it is possible for institution located in remote area to join the network.

Therefore, we notice that if the public libraries are to really reach the public and achieve the status of national network system, the adaptation of new sophisticated techniques and technologies are a highly important pre-requisite. We must change with the times and learn from the latest trends in the west. For this, we have to develop the infrastructure of public libraries and give attention to the manpower development, training given in the use of computers, AACR-II, use of MARC format Library Congress subject headings, handling of software, etc. and use of electronic mail and INTERNET.

4.5 Functions of Library Networks

Library Networks have been established with the main purpose of sharing resources so that unnecessary wastage of limited finance with them can be avoided. However, not all networks conform to the essential functions of library networks. It is noted that the essential functions should include the promotion of resource sharing, creation of resource sharing tools like union catalogues, rationalization of acquisitions and adoption of international standards for creation of records uniformly and delivery of

documents. Keeping these things in view, functions of a typical library network might fall into the following three categories:

- ◇ Information services to users
- ◇ Technical services to member libraries
- ◇ Management service to the network administration

Information and technical services are goal-oriented, i.e. to fulfill the primary goal of the network. Functions that serve the users directly, i.e. information services to users are:

Information services

Inter-library loan service – it means that each member library may require having the facility to photocopy for delivering the documents. Reference and Referral – each member library may require the facility of having dedicated telephone and/or E-mail service. Access to databases – to prepare retrospective bibliography for the purpose of browsing to know whether or not a document is available.

Technical Services

Functions that serve the libraries i.e. the technical services are:

- ▣ Co-operative collection development programme
- ▣ Technical processing involved in acquisition
- ▣ Cataloguing and other means of resources to identify and to locate documents
- ▣ Circulation control system

Management services

The management services, i.e. functions that support the network administration are:

- Establish an operational system that implements the functions mentioned above
- Evaluation of the networks. This is done through
 - Collection of statistics
 - Analysis of performance of the network

- User studies
- Training activities. These are done through
 - Staff development programmes
 - User oriented programmes
- Cost analysis which involves
 - Determination of costs, fees to be collected etc. and
 - Allocation of Budgets.
- Communication of activities such as
 - Holding of meetings
 - Publication of newsletters, etc.

4.6 Structure of Networking

The earlier stated functions of a network can be implemented in different models of networks.

The structure of a network will depend upon the purpose for which libraries use it. A number of libraries should join the network that offers the facilities to make their functioning simpler, better and more cost effective. For instance, college libraries in a state may choose a model which is of totally decentralized type. However, the affiliated colleges in a college system can be linked to the respective college library; such a model may be known as distributed type. The public library system may choose a model of hierarchical type. Special libraries in a city may choose a model, which is of totally decentralized.

These are three basic anatomical structures, namely:

- ➔ Star network
- ➔ Hierarchical network
- ➔ Distributed network

4.6.1 Star Network

In a star network, one of the members maintains and operates a centralized bibliographical database. This database consists of all the bibliographical records of every member libraries.

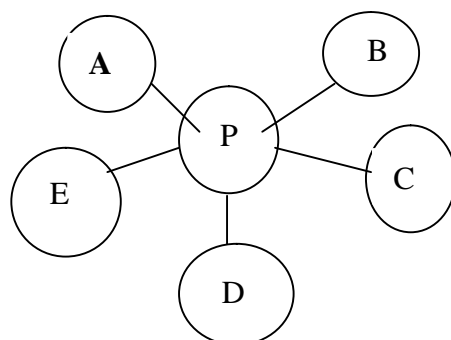


Fig. 2- Diagram of Star Network

The node P holds all the bibliographical resources (databases) with all other members A, B, C, D, and E utilizing these resources. It is the obligation of the node P to maintain and update the databases.

4.6.2 Hierarchical Network

Each member shares resources locally; each participating library at the lower level passes unsatisfied needs to the participating library which is at the higher level. The requests remaining unsatisfied are referred to the 'library of last resort' which may be obliged to check other centers to locate required materials. The configuration is

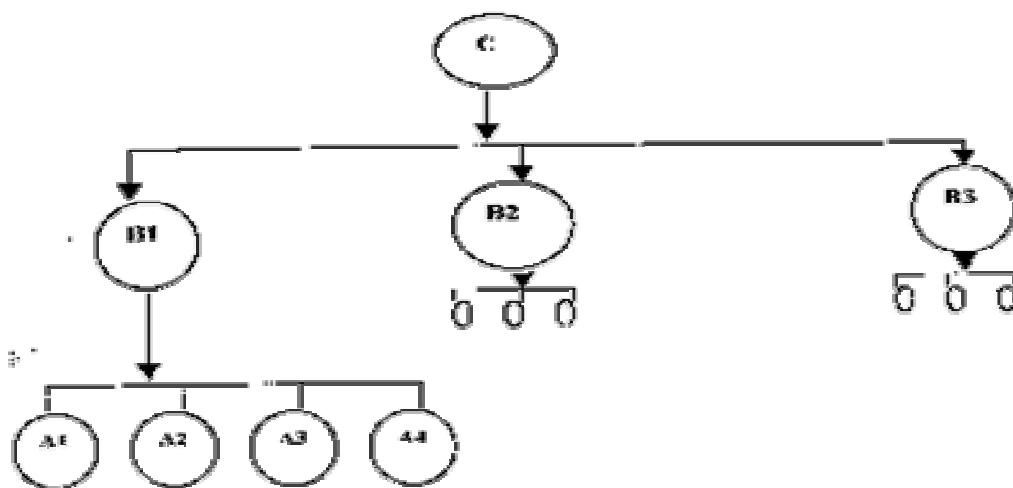


Fig. 3: Diagram of Hierarchical Network

Users of the network, members A_1, A_2, A_3, A_4 are mostly satisfied with the resources available in their respective libraries. Unsatisfied requests are passed on to the higher level resource centre B, finally the few remaining unsatisfied requests are referred to the library of last resort C which may be obliged to check other centers B_2 and B_3 to locate required materials.

4.6.3 Distributed Network

In a totally decentralized model, a type of distributed model, all network members hold in theory different resources which they may share with one another.

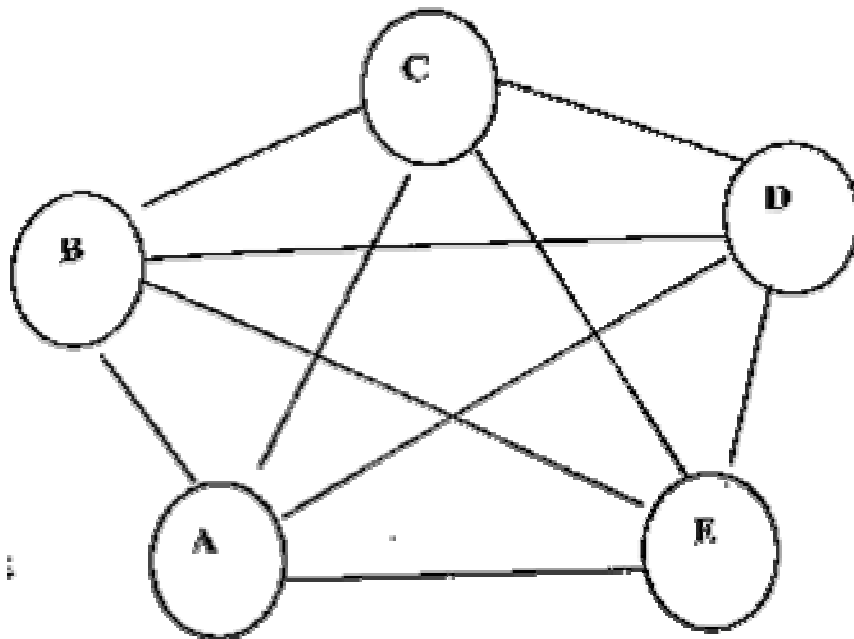


Fig. 4: Diagram of Distributed Network

Here all members A, B, C, D, E, have different resources which they share with one another.

A modified model of a decentralized network looks like

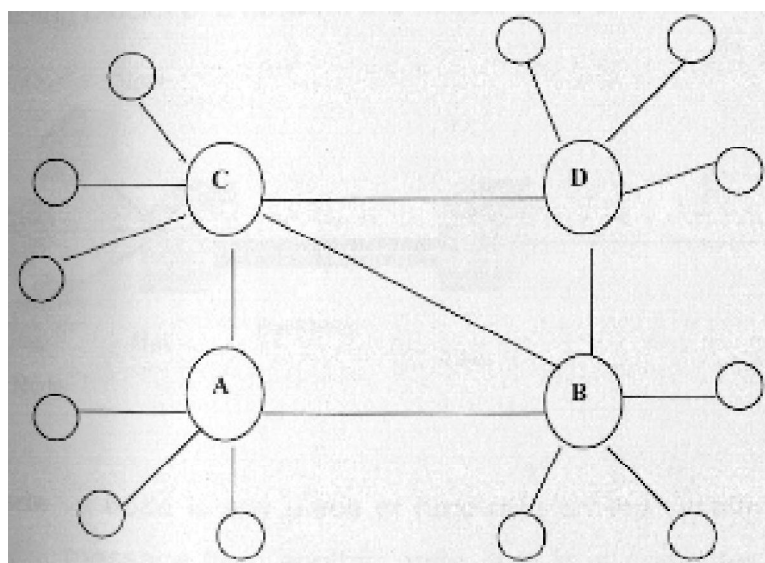


Fig. 5: Diagram of Decentralized Network

Here A, B, C and D are themselves a network, either to star type or a hierarchical type.

4.7 Network Technology: A Brief Idea

The world over, library networks and consortia have developed technologies to facilitate the process of accessing databases, retrieval of information, processing of interlibrary loan requests and the delivery of documents. So we must have some idea about the network technology in general – various terms used in the context of networking, standards, protocols and the software that convert data from one format to another and the technology relevant to Information and information Service field in particular.

4.7.1 Basic Network Architecture / Topology

A network's architecture is the way the data flows within the network. The basic building blocks of a network are nodes, hubs and backbones.

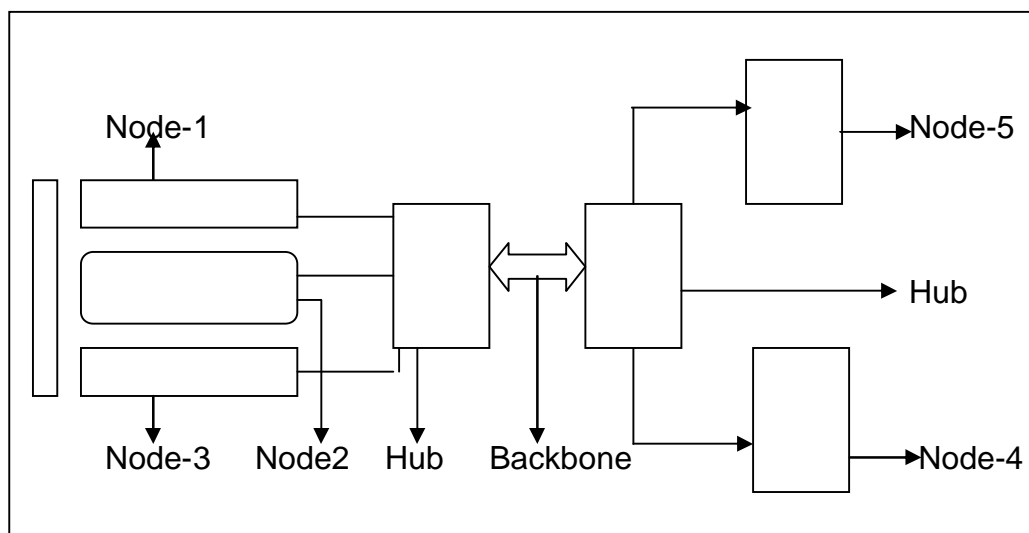


Fig. 6: Basic Network Architecture

Node

A node is any piece of hardware on the system that can be addressed by a message from another node, that is, a computer, printer, fax, modems or CD-ROM drive.

Hub

It is a device that accepts multiple connections. Nodes are connected to it. It, also known as concentrator, simplifies the wiring of the nodes to each other and routes signals between the nodes. There are many different types of hubs. Some are simple hardware devices that only accept connections called passive hubs; others are complicated electrical components that monitor and control the flow of information to various network locations called active hubs.

Ring Architecture

It arranges the nodes on the network in a circle. When one of the computers on the network sends a signal, it passes it to the next node on the network. If it is not addressed to that node, it is retransmitted to the next node and so on around the circle until it reaches the node it is

addressed to. The connections between computers are not direct, instead, each computer attaches to a hub and the ring itself resides inside the hub.

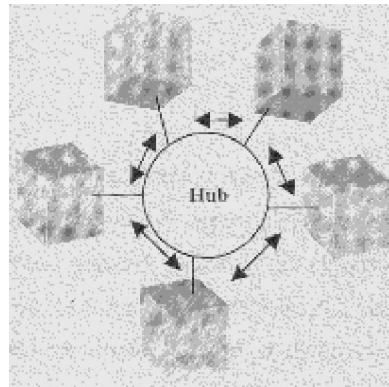


Fig. 7: Ring Architecture

Star Architecture

It has the nodes connected to a central, host, computer when one of the computers as the network sends a signal, the next routes it to the node it's addressed to. There are no direct connections between the nodes on the network except through the host computer.

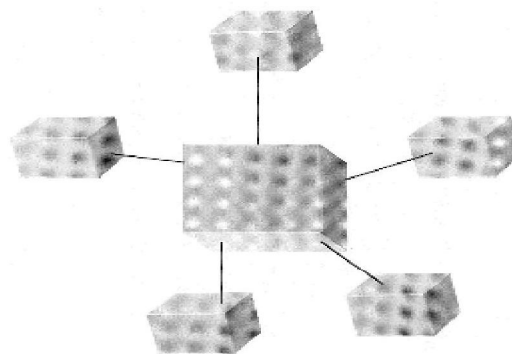


Fig. 8: Star Architecture

Bus Architecture

Bus, or linear, architecture connects all nodes to a single bus much as the components are organized within the computer. A signal addressed to another node is sent to the bus. All other nodes on the network examine

the signal to see if it is addressed to one of them. Typically, wires connect each node to the network's backbone, which is a fixed length of cable with terminator at both ends to stop reflections when signals hit the end.

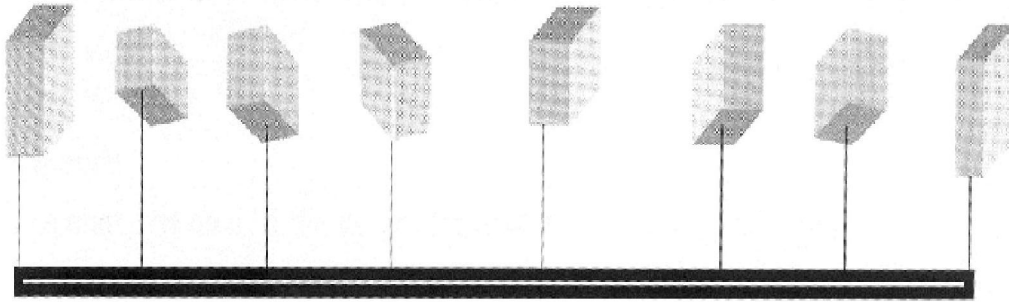


Fig. 9: Bus Architecture

4.7.2 Hardware Components of a Network

(I) Servers

A server on a network is any computer that can be shared by other computers working on the network. In many cases, the server has to be the most powerful computer on the network, because it is shared among so many users or clients. These clients (computers) depend on the server for programs and data, or connection to other computers and devices.

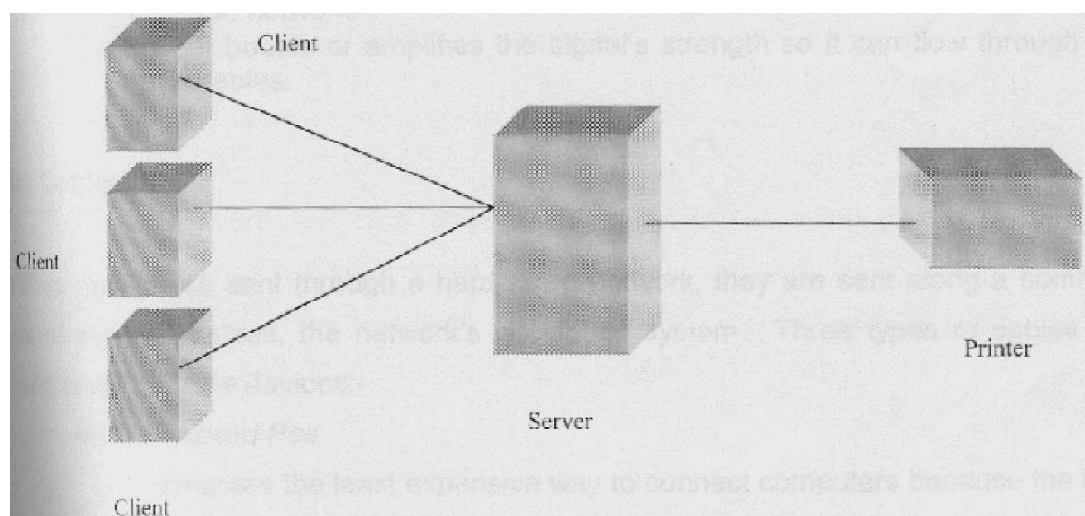


Fig- 10: Diagram of Server

The server can be categorized in three types.

- ☞ File Server
- ☞ Print Server
- ☞ Communication Server

File Server

It stores data files and some application programs. It has large amounts of secondary storage in the form of hard disks, CD-ROM drives, tape drives and other storage devices.

Print Server

It stores print jobs on a hard disk until the printer is ready to handle them.

Communication Server

It can be a fax or modem over which data from any other node can be sent. It can also be used as a gateway to the Internet.

(ii) Network Interface Card

It is the key component of the network workstation. It serves a number of purposes such as,

- It makes the physical connection or bridge between the computer and the network.
- It converts the parallel data on the computer's bus into serial data for the network.
- It boosts or amplifies the signal's strength so it can flow through the cables.

(iii) Cables

When signals are sent through a hard-wired network, they are sent along a common set of wires or cables, the network's circulation system. Three types of cables are used to connect the devices:-

(a) Twisted Pair

They are the least expensive way to connect computers because the wire is cheap and easy to install. However, they are relatively slow and have a tendency to pick up noise that can cause high error rates.

(b) Coaxial

It is the most common type of networking cable. It consists of an inner wire surrounded by a layer of insulating material that is, in turn, surrounded by a braided wire. They are more reliable and durable.

(c) Fiber-optic

It consists of the glass or plastic filament, protected by thick plastic padding and an external plastic sheath. It uses a pulse of laser light instead of an electronic frequency to transmit a signal. Fiber optic cables are fast and reliable, as well as small and light. They have an extremely wide bandwidth, so a large number of signals can be sent simultaneously.

▶ ***Base band Cable***

A cable that transmits only one signal is called a base band cable.

▶ ***Broadband cable:***

This can handle simultaneous transmission of different signals by sending them at different frequencies. Broadband cables are more expensive and require additional frequency modulating equipment.

(iv) Network Devices

When signals are sent through a network, they must be sent in the right direction, and they must also sometimes be amplified so they travel farther or converted so they can be transferred to a different network. These are the roles of a series of hardware devices called repeaters, bridges, routers and gateways.

(a) Repeaters (or Physical relays)

They connect segments of a network, and since signals get weaker & less distinct with distance, these small devices refresh & enhance them before sending them along. They are usually used to extend the network in effect joining two networks together by passing a cable signal between them.

(b) Bridges (or Data Link Relays)

They connect networks, which use different physical links. For example, a network running on twisted pair wires is connected to one using coaxial cable with a bridge.

(c) Routers

They control where messages are sent on networks. The router keeps the addresses of other nodes in a table. If the address of a message sent through the router is on the network, the message is forwarded. If the address is not on the network, the router sends the message to another network by sending it to a gateway.

(d) Gateways

Gateways are used to connect different types of networks. Since two networks may not share a common protocol, these devices translate each network's protocol so the other network can understand the data.

4.8 Types of Networks

4.8.1 Client Server Based Networks

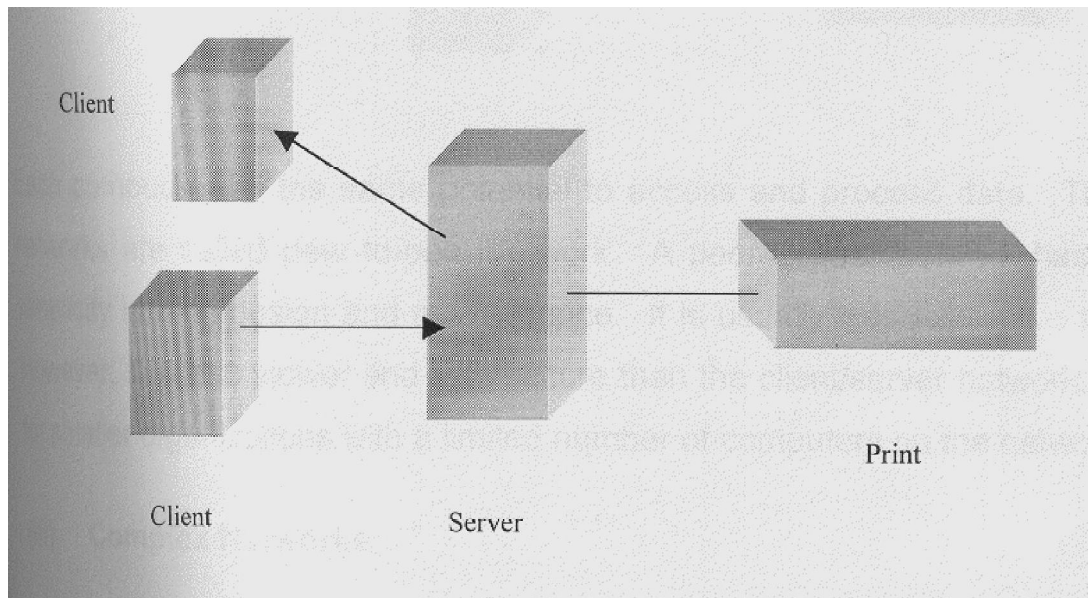


Fig.11: Client Server Based Networks

In this system, clients are usually computers on the network that are operated by human beings, making changes to the data files they receive and when these changes are complete, sending the data back to the file server for storage.

This arrangement has the virtue of processing efficiently, especially on large networks with dozens or even hundreds of machines. With the full processing power of a very powerful computer allocated solely to sending and sorting files, individual clients are not kept waiting for data and they can process different files with different software independently of each other.

The only disadvantage with this kind of network is that if file server goes down, the whole network comes to a halt.

4.8.2 Peer-to-Peer Network

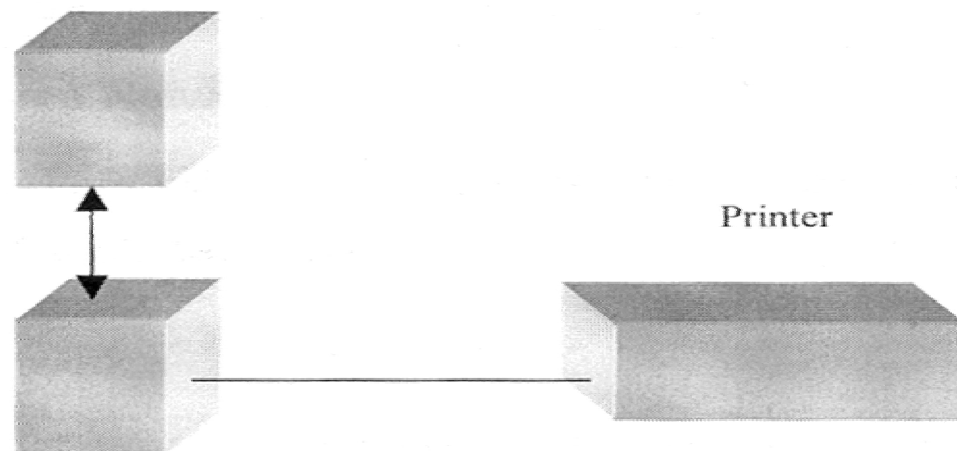


Fig. 12: Peer-to-Peer Network

Each computer has the same potential to access and process data. These types of networks are called peer-to-peer network. A peer-to-peer network has the virtue of simplicity in both design and maintenance. It is usually less expensive to set as well. However, it is also slower and less secure than the client/server network. It is suitable for smaller organizations with a limited number of computers on the network.

4.8.3 Complex Networks

A network can be connected to other networks and networks can consist of different types of machines from different vendors each with its own unique way of handling electronic information, not directly understood by other machines on the network. Special software and hardware can be attached to the network to handle this complicated set up. These devices are called bridges, routes and gateways; perform in different ways the task of "translating" the electronic information supplied by one machine into a format that can be understood by another.

4.8.4 LAN, MAN, WAN

These networks are classified according to their geographical coverage.

(a) LAN – Local Area Network

A network is called Local Area Network if the computers comprising it are located within the same building or within a distance range less than one kilometer from each other.

(b) MAN – Metropolitan Area Network

It inter-connects computers within a metropolitan city. Cellular phone networks are a good example of such networks.

(c) WAN – Wide Area Network

A network is called Wide Area Network if the computers comprising it are distributed over a large geographical region may be all over the country, all over the world or any distance range more than 30 kilometer. Parts of the network may be connected by the cables and other parts by microwave or satellite transmission. Typical wide area networks are those operated by the telephone companies. The Internet is probably the widest of all networks in that it links not only LANs but also other WANS.

4.9 Network Protocols and Standards

If computers are to talk to each other, they need an agreed set of rules called protocols by which they can communicate. The protocols are techniques to govern the flow of data from one computer to another. For different types of computer to be able to communicate effectively, standards need to have been set for the periodicals.

(A) Network Standards

These standards may result from international agreement or do facts, from a particular manufacturer becoming dominant in the networking field. The three most important bodies involved in setting standards in the field of computer networking are CCITT, ISO and IEEE.

CCITT (Comite Consultatif International Telegraphique et Telephonique) i.e., International Consultative Committee for Telegraphy and Telephony

is responsible for the V, X and I standards. The V standards are for data communication over in Public Switched Telephone Network (PZSTN), e.g. the modem standards V_{21} , V_{22} of 300/300, 1200/1200, 2900/2900, 1200/75 and 9600/9600 bits per second. The X standards are for dedicated data communication services e.g. X.25 for packet switching services and X.400 for messaging. I standards are for Integrated Services Digital Networks (ISDN)) e.g. I.400 series specifies the interface between the user equipments and the network.

ISO, the International Standard Organization, have developed a 7 layer model known as Open Systems Interconnection (OSI) model to describe the way in which computer networks operate. This model ranges through from the physical connections at level 1 through the transport protocols at level 4 to end-user applications at level 7. The purpose of this model is to help develop 'open' standards.

IEEE, the Institute of Electrical and Electronics Engineers, an American body, have developed and recommended standards for the physical connection of computers. In the networking field, since 1985 they have developed standard 802.5 for Token Ring Networks and 802.3 for an Ethernet connection between computers. These standards have been adopted by ANSI (American National Standards Institute) and ISO.

(B) Protocols controlling data transfer over the network

In the early 1960s when researchers tried to connect computers with each other, they thought of various techniques to govern the flow of data from one computer to another. Some of them are:

(i) Netware Core Protocol (NCP)

Developed by Novell Netware, it manages the flow of data between Netware Clients and File Server for maximum efficiency. It is earliest of the protocol among different Network protocol to govern the flow of data

from one computer to another. It is a combination of Bits with different portions representing functions to be performed.

(ii) Transmission Control Protocol/Internet Protocol (TCP/IP).

TCP/IP works on the principle of packet switching which involves breaking the data into small chunks and sending these chunks along the network. TCP divides the data into small chunks with each chunk not exceeding 546 bytes and pass them to IP, the next protocol in the transmission process. Each packet is attached with information about source and destination; this resulted into many packets flowing through the same network line with each data packets reaching its correct destination.

(iii) Internet work Packet Exchange (IPX)

It handles data verification and addressing responsibilities for flow of data between different networks, e.g. between Netware Networks and other networks. It adds a header to the information received from TCP Protocol containing the address of the destination, and then it passes the data to Network Interface Card for transmission.

(iv) Sequenced Packet Exchange (SPX)

It verifies the accuracy of the data by using Network Operating System (NOS). It also verifies the accuracy of the remote station to which the data is to be sent by performing some initial communications with the destination workstation. If it gets a confirmation back from the remote or destination station only then, it sends out the data, otherwise it reconfirms by sending the repeated communications. If it fails to get a response from the destination, it issues a notification to the application programme about the failure of the data transmission.

(C) Standards & Protocols: Library and Information Science Field

Resource sharing technology cannot work effectively unless appropriate tools are developed. These tools include the creation of standard

bibliographic databases such as union catalogue of books and periodicals, union lists of serials, bibliographic databases of articles and other types of materials, such as CDs, Video-recordings, Sound recordings, theses and dissertations. It becomes necessary to use the methods and tools that help in quick and identification and deliver of documents. However, the adoption of different bibliographic standards creates incompatibility problems and that acts as a major barrier in the use of bibliographic and related information. The standards, protocols and the software that convert data from one format to another should be of international standard.

(i) Bibliographic Standards

Format compatibilities are necessary for computerized catalogue data and these are being standardized by the International Standards Organization. ISO 2709 has been adopted the world over and the efforts to harmonize MARC formats are on. The Library of Congress and National Library of Canada achieved the result in harmonizing their MARC formats in 1997. It is hoped that various MARC formats will also get harmonized in due course.

Maintenance of bibliographic standards uniformly is essential for quick exchange of records, e.g. Delhi Library Network (DELNET) has adopted the following standards:

- ▶ AACR-II. It is widely accepted code for cataloguing. It helps in the creation of standard records.
- ▶ MARC format;
- ▶ LCSH, Library of Congress Subject Headings.

These are used by many networks and libraries in the world. They are a major guide for creating subject headings. Other thesauri available on specialized subjects are also used whenever needed in specialized libraries. DDC is also commonly used for classification of terms.

Standards have been developed by the International Standards Organization and National Information Standards Organization of the US besides a number of national standards organization for creating standard bibliographic and information products. Some examples are as following:

- National Information Standards Series: ISSN 1041-5653
- Z39.2-1994 - Information Interchange Format
- Z39.901992 - International Standard Serial Numbering
- Z39.14-1997 - Guidelines for Abstracts
- Z39.14-1993 - Guidelines for the Construction, Format and Industry
- Z39.44-1486 - Serials Holding Statements

The other standards include:

- ➔ Z39.50-1995 Information Retrieval. Application Service Definition and Protocol Specification (version 3)
- ➔ Z39.53-1999 Code for the Representation of Languages for Information Interchange
- ➔ Z39.57-1989 (R1995) Holding statements for Non-serials Items
- ➔ Z39.58-1992 Common Command Language for Online Interactive Information Retrieval
- ➔ Z39.63-1989 Interlibrary Loan Data Elements
- ➔ Z39.64-1989(R1995) East Asian Character Code for Bibliographic use
- ➔ ANSI/NISD/ ISO 2108 International Standard Book Numbering (ISBN)
- ➔ ANSI/NISO/ISO 9660 Volume and File Structure of CD-ROM for Information Exchange
- ➔ TRO2-1997 Guidelines for Indexes and Related Information Retrieval Services

(ii) Communication Standards

The effective electronic resource sharing has been hampered by the inability to interconnect, effectively and economically, many diverse electronic library and information databases, which exist worldwide. These standards provide the mechanisms to reduce the existing fragmentation of information and service delivery.

Z39.50

z39.50 (ANSI/NISO Z39.50-1995 (ISO 23950)) is an American National Standard for Information Retrieval Prepared by the National Information Standards Organization (NISO), it defines how one system can cooperate with other systems for the purpose of searching databases and receiving records. As a network protocol, the z39.50 standard provides a set of rules that govern the formats and procedures for the exchange of messages between a client and server, enabling the user to search remote databases, identify records which meet specified criteria and to retrieve some or all the identified records. It is concerned, in particular, with the search and retrieval of information in databases. It simplifies the search process and enables uniform access to a large number of diverse and heterogeneous information sources.

In library networking, z39.50 has assumed greater importance and is the most important protocol available today. In sum, this protocol:

- Provides a mechanism, using clients server model for transmitting and managing queries and result sets
- Is a generalized mechanism and can be used for bibliographic, full text and other types of databases
- Enables the client to perform searches and creates result sets. The records pertaining to the results can be presented to the client or used for creating new result sets with other searches
- Conforms to one or more common syntaxes and yet it is not necessary that he same syntax is shared in all databases.

The methodology for interaction between a client and server is as follows:

- ▶ A client sends an INITIALISE request and server responds with INITIALISE response.
- ▶ As soon as the session is established, the search request can be made by the client.
- ▶ The server respects with the search results
- ▶ Only one search result is made at one time and is served.
- ▶ Records are transmitted to the clients as soon as the client makes the PRESENT request.

There are other facilities like account control, deletion, termination of the session and enhanced features like sort, browse, ILL, etc.

For libraries, Z39.50 could very well provide a single interface allowing libraries to support a number of different services. Various library applications include

- ⇒ Reference searching of other system
- ⇒ Copy cataloguing
- ⇒ Collection Development and Interlibrary loans

Virtual libraries: Access to digital collections

In India, Indian Agricultural Research Institute, Pusa Road, New Delhi has taken the lead to install the first Z39.50 server in India and make to databases available to the Z39.50 clients.

◆ ILL Protocol

The ILL protocol is used to provide just ILL services. Several vendors use it in their software. In the ILL protocol, the services represent the activities. These services are such as ILL request, RECEIVED, RETURNED, RENEW, LOST (item requested is lost) and CANCELLED (cancellation of the request). There are optional messages such as SHIPPED, RETURNED, RECEIVED and CHECKED-IN. When the requests are in operation, the messages such as PENDING and IN-

PROCESS are used. These are several other services used by the protocol and they are requested by messages such as ILL-ANSWER, FORWARD-NOTIFICATION, etc.

The National Library of Canada has developed a protocol for ILL communications in order to facilitate resource sharing in a networking environment. The protocol has been designed to encourage software developers and members of the library and the information community to adopt the protocol and incorporate it into ILL systems. The protocol is expected to be POST (Open System Interconnection) based and is able to communicate with all types of hardware, software communication facilities used. OSI provides interconnectivity and interoperability in order to communicate with all types of hardware and allow transfer and communication of data among them. Improvement of interlibrary loan facility through electronic messaging is possible if we use Open System Interconnection (OSI) Reference Model and improve the telecommunication infrastructure.

◆ **CD-ROMs**

The CD-ROMs technology influenced its wider applications in libraries since 1980s as a major resource of information, which can be used for

- ➔ Creating catalogues, bibliographies, union catalogues, full text databases, etc.
- ➔ Distributing catalogues among libraries of a network for resource sharing
- ➔ Cooperative collection development
- ➔ Promoting cooperation among libraries of a network
- ➔ Increasing access to resources by users who are at a distance within or without a country
- ➔ Making access user friendly
- ➔ Reducing costs of accessing and disseminating information

- ➔ Storing large databases at several locations simultaneously for research and references.

For example, a CD-ROM union catalogue can offer an offline access to the resources of a library network which is both convenient and inexpensive. When an online system fails in a participating library, the use of CD-ROM could be proved very useful. Besides, information stored on CD-ROM attached to one of the computers on the network, can be accessed by users on another computer on the network. This is known as CD-ROM networking.

Initially, CD-ROM was distributed on a single workstation configuration, which was too expensive for the small institutes and information centers. However, introduction of multi-user and multi-disk CD-ROM system have made cost and sharing of information more economical for most of the organizations, especially where the same data or database are required for several users.

4.10 Essentials & Requirements for Library Networking

Since Library Networking is meant to promote and facilitate sharing of resources available within a group of participating libraries, several factors are to be considered for planning such on a network. The following are very important:

- (i) Member libraries must justify need for a network. The development of a viable network demands planning not only among the network members but also between the members and users themselves.
- (ii) Member libraries must agree upon a network policy is to be implemented. The policy must clearly state.

Objectives of the Network-

The main objective may be to share the resources among the member libraries. It may be achieved in several ways, for example,

- ⊙ Users of the member libraries may be allowed only to refer the documents in any of the other participating libraries.
- ⊙ Limited number of periodicals/book may directly be issued to users of all the member libraries.
- ⊙ Providing photocopies of the articles/monographs
- ⊙ Co-operative collection development programmes.

Network Structure

- ◆ Member libraries should adopt that structure of a network, which will fulfill the purpose for which libraries use it. The lack of arrangement in developing a network structure undermines both the approach of functions and planning.
- ◆ Member libraries must identify the funding agencies and mobilize the resources in advance. The financial resources must freely flow while implementing the system. If necessary, network fee may be collected from each of the member libraries. The examples of library networks in the western countries suggest that all networks based on a fee structure can be maintained without grant and are viable in the long run.
- ◆ For resource sharing among member libraries, it is necessary to create bibliographic tools like union catalogues and union lists based on the resources available in the participating libraries.
- ◆ Depending on the objectives or type of network model, databases of library collections should be developed. If the network is of star type, a centralized database consisting of all the records in all member libraries is necessary. If the network is of any other type, database for each of the library collections has to be developed separately.
- ◆ For the purpose of creating databases, it is essential to agree upon a standard. All libraries should follow a standard MARC format, AACR-II, a standard thesaurus like Library of Congress Subject Headings (LCSH) etc. uniformly.

- ◆ Although efforts should be made to have one classification scheme in all participating libraries but use of different numbers should not become a hurdle as search requests are mostly by authors, titles, editors and subject descriptions.
- ◆ Member libraries must agree upon indexing system to be followed. In a centralized database system (a star network), it is preferable to adopt a single systems of indexing, i.e. POPSI, chain indexing or any other system. However, in a decentralized or in a hierarchical system, each library may have a freedom to adopt an indexing system of their choice. In such cases, the software must be developed to switch from one database to another database and then one indexing file to another indexing file while searching.
- ◆ For the success of network in a long run, each of the member libraries must have a policy to automate every function of the library – acquisition, cataloguing, classification, serials control, circulation, SDI, current awareness services etc. – in the shortest possible time. This helps the library to have computer culture which is required to design, develop, maintain and to operate several databases, to reduce the cost of library operations as well as network operations.
- ◆ The major problem in each of the member libraries is to prepare the machine-readable records for the existing catalogue. Prior to creating such records, one has to identify frequently used and infrequently used documents. Then prepare the machine-readable catalogue appropriately for the frequently used documents or alternatively use the existing machine-readable databases by downloading from CD-ROMs or from other databases and reformatting them, one can select the appropriate records for their respective database.
- ◆ The network should be able to recommend to participating libraries the type of hardware and software they need for their in-house functions and for networking purposes. Hardware should be

selected considering the number of entries the participating libraries can generate within the next 3-5 years. The hardware at the Central Host speed with which participating libraries generate records and the network pools them into the Central Host.

- ◆ The network software may or may not support the in-house operations of the libraries in the beginning but eventually the network software should not only be able to create union catalogues or full text databases, etc. but also get integrated with the in-house operations.
- ◆ If there is no adequate trained manpower in each of the member libraries, attempts should be made to train or/and recruit library personnel.
- ◆ In addition to the databases, hardware, software and trained manpower, it is preferable to have certain communication facilities such as Fax, Telex, Telephone, etc. as a part of the network system in each of the member libraries for the effective working of the network. E-mail and INTERNET facilities should be available with the libraries and they should be able to access international databases, preferably individually or through the network host to begin with.
- ◆ Inter-libraries loan services should grow and may be interlinked with the search of the union catalogues. Delivery of documents should be fast, either electronically through fax or through courier or Mail. Rationalization of acquisitions needs to be undertaken.
- ◆ The member libraries should be willing partners, ready to buy hardware, etc. and should be willing to send professional staff for training. They should be willing to pool bibliographic records to the Central Host of the network besides adhering to other network obligations.
- ◆ A performance criterion should be developed and agreed upon to evaluate the working of the network.

Hardware and Software Requirements

(a) Hardware Requirements

Each of the member libraries must have at least some of the following hardware. However, the main library (Central Host) may require most of the hardware mentioned below, but with additional disk space. Hardware specifications are given below:

I. Server:

- ▶ Pentium @233 MHz with 64 MB RAM
- ▶ 1.2 GB HDD
- ▶ 32 x CDROM Drive
- ▶ 1.44" Floppy Drive
- ▶ Color Monitor (SVGA)
- ▶ Windows-NT Operating System
- ▶ MS-SQL Server 6.5

II. Client:

- ▶ Pentium @233 MHz with 32 MB RAM
- ▶ 1.2 GB HDD
- ▶ 1.44" Floppy Drive
- ▶ Colour Monitor (SVGA)
- ▶ Windows-98 Operating System

III. Other Hardware

- ▶ Fax (with dedicated phone line)
- ▶ Modem (with dedicated phone line)
- ▶ Telex
- ▶ CD-ROM drive
- ▶ At least two determine printers
- ▶ One letter quality printer (preferably laser printer)
- ▶ Cartridge type drive

(b) Software Requirements

Each of the participating libraries must have the following:

- ▶ Software for effective network operation as well as the library automation
- ▶ DOS (latest version) and/or
- ▶ UNIX (latest version, to begin with, it may be optional)
- ▶ LAN (Novel/Ethernet, to begin with, it may be optional)
- ▶ Software for E-mail (at least PROCOMM)
- ▶ Word processors
- ▶ DBMS packages
- ▶ IR packages CDS/ISIS
- ▶ Library automation: Libsys/Granthalaya/any other similar packages
- ▶ Programming languages: C/C++

(c) Software Evaluation

Software evaluation is quite often a difficult task. We have to consider the following procedure, criteria and features to evaluate software packages.

Procedures for Evaluation

The following procedures may be considered to evaluate software packages:

- ▶ Select software after carefully examining the existing literature
- ▶ Examine carefully its literature and documentation
- ▶ Compare it with various other packages, keeping in view the following points
- ▶ On-site evaluation
- ▶ Post installation service (if the software is corrupted for various reasons, will the vendor replace it?).

Criteria for Evaluation

Some of the criteria for evaluation of software are:

- ☛ Ease of operation

- ☞ Quality of documentation
- ☞ Hardware limitations
- ☞ Speed of operation
- ☞ Security in multi-user environment
- ☞ De-bugging facility and proper error messages while executing
- ☞ Support from vendor

Features of Software

Some of the important features of software are:

- ☞ User friendly
- ☞ Provision to on-line interaction, especially while editing inputting, retrieving and in data management.
- ☞ Provision to obtain outputs in various formats
- ☞ Compatibility and portability.

Factors to be considered

Finally, one has to consider several factors while acquiring a computer. These are:

Memory and Storage Capabilities

- Memory size
- Auxiliary storage devices like tape, disk, cassette, etc.

Availability of input output devices

- Availability of terminal
- Speed and capabilities of input and output devices such as the ability to process lower case letters and special symbols.

Facilities to extend the memory and input-output devices

Maintenance facilities provided by the manufacturer must be compatible with,

- Other machines especially with locally available machines
- With main frame computers, this may be available in the parent organization

In regards to the availability, compatibility the software requires to be

- Available in popular languages
- Compatible with various operating systems.

Further, there should be the provision of getting special software for performing multifarious works.

Therefore, we should take into account various specifications regarding establishment of a Library Network. The objectives, functions, requirements for hardware and software and structure of the network should be pre-defined before the establishment of a library network.

4.11 Models

The traditional concept of library is being redefined from a place to access book to one which houses the most advanced media including CD-ROM, Internet, and remote access to a wide range of resource. Libraries are now being slowly metamorphosing into digital institutions. Earlier a library was judged by its quantitative resources. Today, libraries are surrounded by networked data that is connected to vast ocean of Internet-based services.

Increasingly, libraries are facing the challenges presented by the need to acquire, manage and archive electronic resources. Libraries must be able to supply these resources to users on demand. As the Libraries come to depend more and more on electronic resources, they will require comprehensive library - and information – management systems that are able to keep track of resources wherever and in whatever form they exist. The College Libraries do need an information technology strategy that results in the efficient integration of a variety of technical platforms, applications software, networking options, and access mechanisms as well as one that addresses copyright and other intellectual property issues.

An effort has been in this chapter to propose a model integrated library management software with functions, features and standards which should be adhered to international standards in the changing information environment. The Integrated Library Management Software is under continuous development due to various developments taking place primarily in information technology and publishing industry. The process approaches the best practices for automation in college libraries to serve as guidelines in preparing, implementing and managing an automated system.

Need for Strategic Plan

The recent rapid evolution in the past few years of libraries and integrated library systems themselves now presents some interesting challenges. With the growing capabilities of today's technological advances in the use of web, digital components and electronic resources, expectations have grown high. Libraries have to be more responsive to user needs in order to provide services that are better aligned to meet-and possibly exceed-their expectations.

The typical library automation environment today, especially for a college library, would require an ILS to manage traditional content and a suite of additional products to lend support for electronic content. Many now offer some sort of met search environment separate from their ILS and associated OPAC for searching the packages of e-content they offer. It also seems that not all libraries find the interface offered by the standard Web-based OPAC entirely satisfactory. One of the most recent trends in the ILS product area is to provide an alternate interface, instead of, or in addition to, the OPAC interface provided with the ILS.

Pre-requisites for Successful Library Automation

Computer and information technology represent a fundamental change in the way libraries function. Libraries must make an ongoing commitment to

keeping pace with change. Therefore, like automated systems, plans must also change with time. Plans must be regularly revised and updated as the environment and needs change. In general, a library should conduct a major re-examination of its plans periodically, and should review its plans on an annual basis. The administration and management of integrated library systems is no small task. It involves a multitude of persons working together to make it successful.

E- Publishing

The transition from print to electronic distribution has caused significant disruption to the publishing industry, and also to marketing the resources. The challenges are traditional scholarly communication converting the traditional publishing to the digital environment; new intellectual property rights issues, alternatives to journals and dramatic increase in all forms of information content etc. These challenges along with supporting technologies have created major issues around copyright, ownership and management of digital resources. Libraries, in the future, will create, publish, and compile information, embracing various kinds of publication and dissemination roles in a networked environment. Librarians and other staff will be partners as well as innovators in information technologies, distance education, information literacy programs, and in the creation of new models of scholarly communication. Electronic resources are important components of library collections, and their number is increasing at a rapid rate. Many publications are now available only in electronic form, a trend we can expect to continue and expand. Librarians must have the automated systems that allow them to develop and manage accessible and cost-effective services that allow them to develop and manage accessible and cost-effective services that match the strategic directions of their parent institutions.

Changes in Education

Innovations in the design and delivery of education to reach to the people are on the increase. But the effectiveness of such innovations and the impact on the faculty productivity is still not clear. The new modes of learning need different approach and new support system for both students and the faculty.

E-learning

In the last few decades, we have witnessed an unprecedented explosion of information in print and, more recently, in electronic formats. This has been triggered by the proliferation of publishers, an increase in the number of researchers and others producing publication of publishers, an increase in the number of researchers and others producing publications, the emergence of the developing countries as an information provider, and the ease of publication and dissemination in the World Wide Web environment. Online public catalogs and other electronic resources helped provide solutions to these problems. The online catalog distributed access to library collections.

Information Resources

One of the challenges the College Libraries face is how to integrate traditional resources with the newer electronic ones and how to help users exploit both types of resources. This emphasis's the need to complete conversion of the card catalog to provide electronic access to all print and traditional non-print resources as well as newer electronic materials.

Users' Expectations

The growth and availability of access to information via the internet and associated technology has transformed the expectations of the client population as well as their service preferences. New technologies and developments have altered the perceived link between information and libraries.

Users are expecting that their library systems are capable of, among such other things, as providing seamless integration between system gateway and OPAC modules providing access to external users on the Internet to the library's OPAC. Researchers want online access to resources wherever they are located. System and network capacity have difficulty in keeping up with these demands. The extension of searching into the Internet environment has further increased these problems. Students, faculty and other staff are developing the expectation that librarians will be able to deliver almost all information to the desktop.

Human Resources

Library automation succeeds through the work performed by hardware, software and people. The library staff is critical to a successful project. Staff acceptance is another important factor contributing to the successful use of information technology in libraries. The successful use of IT in a library depends on the extent to which supervisory and operational staffs are involved in its planning, design, analysis and implementation. Without the right human skills, it is not possible to implement the automation process successfully. If remarkable results can be accomplished with very primitive software, it is all because of the skills of knowledgeable, confident and practical professionals.

Library Services

Functions once mediated by humans, like some library reference searches, can now be mediated electronically. Information providers must anticipate shifts in user's needs and expectations and must adapt the computing infrastructure and support facilities to meet the growing demands of the user community that displays a wide range of expertise.

A basic model of library service in an electronic environment will help to organize in planning efforts at each step in the process. The model consists of:

- ➔ Providing access to the content of local resources such as Books, Journals, etc. that are part of libraries' collection.
- ➔ Offering gateway or portal access to the remote resources such as books, e-journals, other electronic resources, including the ability to obtain copies in print and electronic formats.
- ➔ Facilitating off site electronic access to local and remote resources to from user's desktops.

The environment in which college libraries both nationally and internationally has been undergoing rapid change as a result of a number of factors, which include: impact of technology, changes in approaches to teaching and learning, changing demographics of the student population, and competition amongst universities. Trends in publishing worldwide, in particular, the increasing electronic availability of scholarly publications and the increased cost of acquiring library resources and copyright, have also had a major impact. Budget constraints are a determining factor.

Therefore, as libraries provide new levels of service for customers, the focus has shifted to those tools which can document and support these. The development of statistical measures for relevant electronic services, for example, becomes critical- given the increasing access to resources by remote customers. In addition the fact that libraries are part of a larger network of local and remote library- related systems and services leads quite logically to integration and interoperability.

Standards Related to Library Automation Systems

The widespread use of integrated library system (ILS), global communications via the Internet, and growing numbers of digital library initiatives have made the need for compliance with standards more critical than ever. Implementing information products and systems that support standards can ensure that libraries will be able to adopt more easily new technologies.

The following standards address a variety of issues in the area of library automation. In addition to the core elements of a library automated system (Public access catalog, Cataloguing, circulation, acquisitions, and serials), remote access, imaging and full- text document management are included. These standards address only a limited number of topics; they are not sufficient by themselves for developing a comprehensive set of specifications. The system must comply with the following library and information industry standards, depending on the need of the library:

(i) Bibliographic Formats (MARC 21); (ii) Record structure, Character Sets, and Exchange Media; (iii) Serials- Serial Item and Contribution Identifier (SICI); (iv) Circulation (NICP); (v) Barcodes (Code 39, Coda bar); (vi) Resource sharing and Interlibrary Loan (ILL Protocol); (vii) Information Retrieval (Z39.50); (viii) Command searching (CQL); (ix) Metadata; (x) Unicode; (xi) Encoded Archival Description; (xii) Web Access; (xiii) Open URL and (xiv) XML and (xv) Local area network (IEEE 802.xx) (Hodgson, 2002).

Developing a Library Profile

One of the most important planning tools involves collecting basic statistical information on the library and its operations. It is important to take stock of any existing automation in the library by compiling the following data:

- ▶ Percentage of collection that has catalog records in machine-readable form;
- ▶ Description of collection without machine-readable records, by type of material;
- ▶ Description of currently-automated library function;
- ▶ Estimates of the location and number of workstations; and,
- ▶ Specifications for any existing equipment to be re-used with any future system.
- ▶ Number of titles and volumes in the collection, current and projected;

- ▶ Number of borrowers, current and projected;
- ▶ Number of materials circulated current and projected;
- ▶ Number of new materials acquired current and projected;

Interlibrary loans lent to and borrowed from other libraries;

At the same time while this data is being assembled, it is important to assess user's needs and set service priorities. This can be accomplished by undertaking a focused, strategic planning process designed to involve the library's "stakeholders".

4.12 Developing a Strategic Plan

A library that is planning to automate its operation should undertake a process by which representative staff and users can identify service needs and objectives. The purpose of such an effort is to allow the participants to articulate their interests and concerns, share perspectives and learn about possibilities in a collaborative setting. Group interaction is an important contributing factor in the success of the goal, which is to develop and sustain library automation in the years to come.

4.12.1 Integrated Library System

The ILS represents considerable technology investment by libraries. The success of library process change and information retrieval has been built around the functionality, or otherwise, of the ILS. These systems have provided a solid foundation for both collection management and resource discovery. The information landscape is increasingly fluid and the role of the ILS in this context is becoming more important. Information retrieval is no longer limited to the library-controlled resources.

The functions of integrated library systems need to be considered in the context of trends, strategies and technical issues within the wider information environment. For the library, the fundamental challenge is

integration, and in particular, designing the ways of navigating the wide range of resources using cross-searching and linking tools. The decision of library about what to automate and why depends closely on the overall direction of their mission and service policies.

The objectives of the typical college libraries are committed to provide excellent library and information services to its community by implementing an integrated library management system of superior functionality and cost efficiency. These objectives address only a limited number of topics. They are not sufficient by themselves for developing a comprehensive set of specifications. The type of functionality the college libraries are seeking to incorporate includes (Integrated Library System..., 1997):

A state-of-the-art integrated library system that provides access to public services, collection management, and technical services functions.

- ◆ Consortia-based capabilities such as union catalog and non-mediated requesting of library materials.
- ◆ The ability to effectively convert data from the existing library systems into a new format that will preserve and insure its continued development and preservation as well as the ability to migrate data to new generations of library systems.
- ◆ The ability to exploit emerging technologies and information resources to raise the level of library services, facilitate an increase in staff productivity, and improve effectiveness.
- ◆ Conformity to all national and international standards.
- ◆ Report generator to facilitate retrieval of management information.
- ◆ The integration of electronic resources that are made available through the UGC.

- ◆ Infonet e-Journals Consortium or other initiatives (e.g., bibliographic and full-text databases, image databases, electronic journals, etc.).

Ideally, an ILS should deliver comprehensive automation in an efficient manner. It must handle all the work that happens within the walls of the library and deliver services to users outside the library via the Web. An ILS must also be able to interact with other automation systems by using appropriate standards and protocols. The particulars of what constitutes comprehensive automation change over time. As libraries evolve in the services they offer and the collections they build, it is essential that the ILS evolve in step. Ideally, a system's capabilities should run ahead of the curve. This happens only if the librarians themselves correctly anticipate their future needs well in time (Breeding, 2006).

The library system will maintain an automated library system which supports the internal automation.

4.12.2 Integrated Library Management System

Functional Capabilities of an ILMS Model

The purpose of an integrated library management system is to process, share, and provide access to information in an efficient, useful and timely manner. Functional capabilities of ILMS will fully support all the traditional and modern library functions such as Acquisitions, Cataloging, Serials Control, Circulation, OPAC, Services and Administration and Maintenance. Here is a model which is display all the library housekeeping operations, services and administration functions and features.

Another important factor that deserves careful attention is the security and safety of data. As library databases are usually huge and contain valuable

data, it is necessary to protect expensive resources and data from unauthorized access and viruses.

The ILS will have Electronic Resource Management (ERM), RFID and Open URL features, which will help libraries in electronic resource management, Circulation and Inventory management and Accessing Electronic Journals respectively.

Service Capabilities of an ILMS Model

A library primarily aims at providing effective and efficient services to its clientele, based on library information resources both print and non-print, in-house database and networked resources. Integrated Library Management Systems (ILMS) provides an effective media to deliver the services to its users, be it on the college campus or off the campus. Accessing Bibliographic databases and conducting the specific searches on various topics, accessing library OPACs, personalized services such as SDI, CASs can be provided at minimal cost and effort. Various kinds of reference services can be generated and provided to the patrons by using integrated library software.

Other library information service includes Interlibrary Loan, Document Delivery Service, Web Access, and Digital Reference Services. Through the ILMS and modern technology, these services can be provided more efficiently and accurately. Evaluation has to be done periodically in order to assess the cost effectiveness of these services. Here is a model which is displaying all library information services using ILMS (**vide Figure-13**).

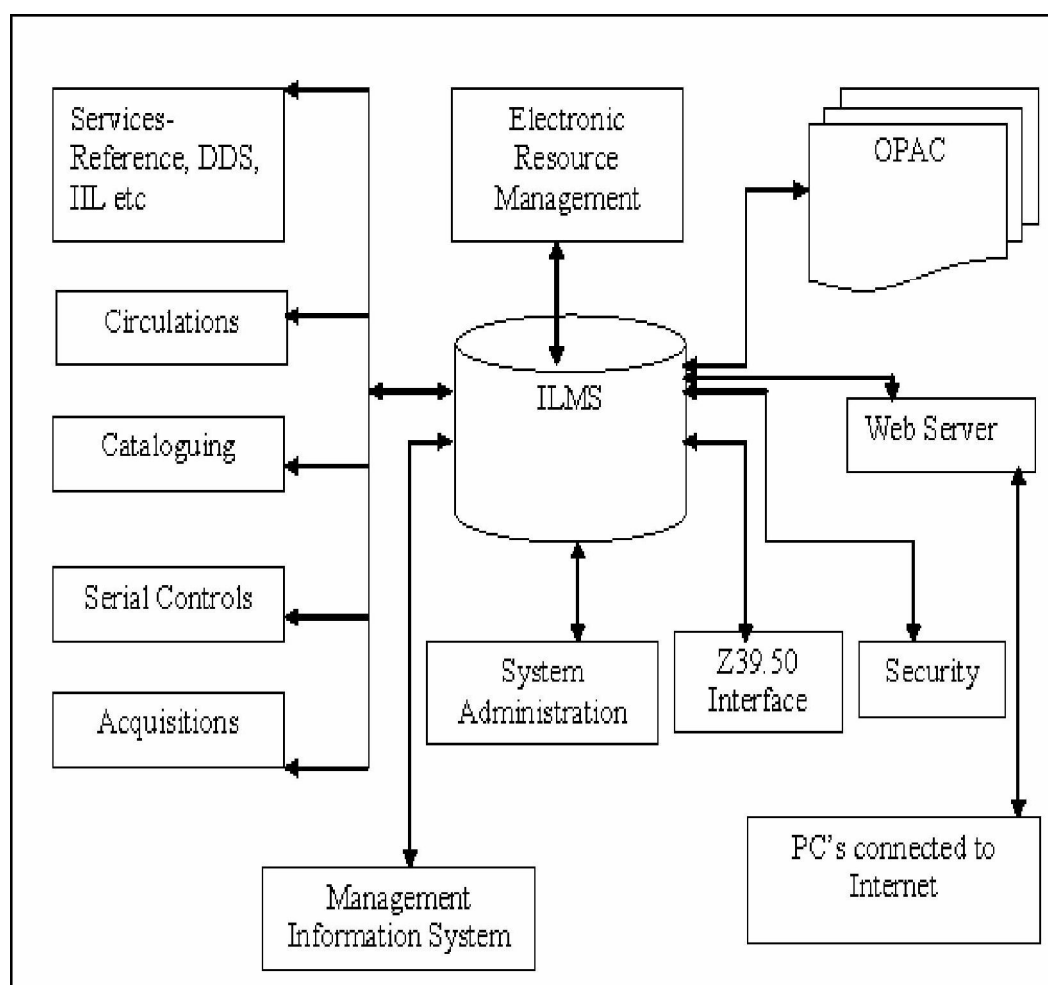


Fig. 13: Functions and Features of a Model Integrated Library Management System

Management Information

The ILS should be capable of providing the statistical data related to items, transaction, finance, etc. to support management of the library. Such statistics will be particularly useful when they are presented as time series so that comparisons can be made from month to month and year to year. The ILS will usually be capable of supporting a number of other functions and process in the library. For example, while a few libraries still perform a complete stock check, the ILS will be able to produce lists of stocks in particular areas, sorted into shelf order.

Integrated College Library and Information System

The central role of a college library is to promote and facilitate effective use of recorded information in different forms and format by its clientele. The important goal of the library is to give all citizens easy access to information regardless of format, and location of where the information is stored. A network is an essential partner in this exercise because it facilitates access to vast information services. Networks have potential role to improve library services in several ways. Information networks have changed from traditional library system to virtual system of World Wide Web sites, a document delivery unit, telephone, E-mail, reference and desktop technical support. The information network must educate its customers who were accustomed to the library as a physical place to check out books, talk to reference librarians and browse journals through information networks. Customers receive services without going to fixed place. For many years the library services assumed the responsibility of searching and supplying information in response to specific requests. The information network must ensure that information can be found or delivered quickly from a large universe. The computer workstations in the libraries are now well equipped for dial-up and Internet access etc.

The libraries and library users' gets benefited from accessing databases, participating in discussion forums, access to other Internet resources. Constant improvements in the networking technology will reduce the cost of information provision, thus creating new opportunities for academic institutions in the research and development. The academic world looking at the college libraries for a total solution or one stop shopping for their requirements The concept of one system, one library will provide users- students faculty, staff and citizens – with access to not only college library collection but also global access to electronic information resources thus providing the integrated college library and information system. (Wisconsin, 2001)

◆ **Strategic Directions, Goals and Actions for an Integrated College Library and Information System**

Implementation of the concept of one system one library requires strategic directions goals and actions. Following functions are studied for providing the integrated access to college library and information system. (Wisconsin, 2001);

- ◇ The library collection has to be developed as an integrated, interdependent resource for college research and teaching with a concept of 'one system, one library' by;
- ★ Developing a nationwide resource sharing which provides open access and common library policies across campuses to serve the user community.
- ★ Allocating funding to enhance resource sharing and delivery of services that will provide the users timely and unrestricted access to all library collections.
- ★ Providing convenient access to a shared collection and materials and electronic resources including full text journals, reference resources, and government information etc. Such resource depends upon strong local collections and will increasingly include digitized materials from the libraries existing collections.
- ★ Promoting cooperative collection development, nationwide licensing of electronic information and coordinated policies to control costs and with respect to copyright and the intellectual property created by faculty and students.
- ★ Inform and associate faculty, administrators, and publishers to develop viable models of scholarly communication that are equitable and affordable.
- ◇ The college library and information system will provide timely access to the high quality, shared book, periodical and multimedia

information resources of the participating libraries and gateways to digital information resources. This can be achieved by:

- ★ Continue to upgrade and enhance the common library management system to support strategic library goals with respect to resource sharing, integrated information access, and controlling costs.
 - ★ Provide the users with variety of research and searching tools to allow online catalog or web access to the digital information resources including multimedia resources.
 - ★ Implement library technologies that will provide users with remote access to course materials via electronic reserve reading services and other electronic learning technologies.
 - ★ Provide complete online access to the cataloguing records of all libraries collections as well as enhanced access to some specialized collections.
 - ★ Support online learning, online degree or certificate programs with appropriate identification, authorization and authentication.
- ◇ Librarians will serve as information managers and teachers who assist their clients with using new learning system and information technologies. The librarian plays various roles in various contexts. The Librarians have been spurred by technological developments to become more efficient organizers, cataloguers, Indexers abstractors, archivers etc. In addition they have now challenging role to play their new roles such as intermediary, educators, facilitators, information manager, custodian of information, provider of information or publisher, knowledge manager etc.
- ◇ The college libraries will collaboratively implement staff development programs that anticipate the changing information resource needs of students and faculty.

To achieve these required parameters are to:

- ☞ Examine to collaborate on staff development initiatives to share expertise and reduce costs.
 - ☞ Encourage innovation and experimentation in developing new services to meet the changing information resource needs of students and faculty.
 - ☞ Encourage critical examination of current practices to most effectively use staff resources, which may lead to opportunities to discontinue unnecessary processes or outsource operations.
 - ☞ Focus on future; explore ways to diversify staff by establishing cooperative programs.
 - ☞ Participate in the development of new academic library leaders in the state.
-
- ◇ The college library and information system will serve as the centre of knowledge and information for their campuses by providing physical facilities and IT infrastructure to promote teaching and learning and meet access requirements for all students, faculty and staff. These can be achieved through:
 - * Work with campus IT to ensure network capacity, hardware and software to support information retrieval.
 - * Assure that the requirements are accommodated in terms of hardware, software and information resources.
 - * Provide work stations and web pages, which implement standards required for access by users.
-
- ◇ The college libraries will become more accessible to the college alumni, citizens, other college etc. and will seek mutually beneficial collaboration to promote educational and economic goals. To do this:
 - ★ Look for joint projects, grants, and cost saving opportunities, and occasions to share expertise.

- ★ Work to develop expanded access to library resources as well as access to other library resources.
- ★ Explore with alumni offices, opportunities to expand library resources available to alumni.
- ◇ The college libraries will seek to develop funding resources for infrastructure development, cost towards electronic access to resources, digital library projects etc. To do this:
 - ☞ Explore the possibilities of funding from the state governments and central government funding.
 - ☞ Working with college system administrators to access the need for funding towards different activities.

These goals can be met by initiating the following actions:

- ➔ Apply resource sharing policy recommendations to universal borrowing implementation.
- ➔ Explore the software options to enhance the resource sharing across the libraries for rapid journal's article delivery capabilities.
- ➔ Implement goals for digitization of rare collection of the library.
- ➔ Expand number of shared databases within the available budgets.
- ➔ Continue to experiment with and develop collection of electronic books.
- ➔ Investigate the role of libraries as repositories for digital learning sources.
- ➔ Identify the methods and procedures for providing access to course materials for online education and make sure the material created are based on standards.
- ➔ Undertake/participate in cooperative journal collection development.
- ➔ Develop mechanism for sharing decisions on periodicals, de-selection and other collection management decision.
- ➔ Conduct review of cooperative collection development policies.

- ➔ Inform the college administration and faculty about the benefits of reducing the cost of information.
- ➔ Investigate/ develop the software that allows searching across multiple electronic resources.
- ➔ Pool resource to provide access to electronic reserves across all libraries.
- ➔ Identify and develop mechanisms for funding sources, resource sharing etc which will adequately serve students and faculty.
- ➔ Support remote access to licensed electronic resources.

◆ **Need for a corroborated system**

The need for establishing an integrated college library and information system is viewed in terms of following points.

- ★ Establishment of Integrated system facilitates the enhancement of existing library facilities and also increase accessibility to all other citizens to library resources and services.
- ★ Can provide training to the library staff that does not currently possess the skills in the use of new information technologies by organizing well- designed training programs with mechanism for follow-up technical assistance and support.
- ★ Promote collaboration and cooperation among libraries for sharing of holdings and technical abilities to maximize scarce resources. Limited holdings, financial capacity, and human resources are major barriers to improving library services.
- ★ Develop recommended standards and guidelines for library services.
- ★ Increase access to electronic information sources.
- ★ The cooperative activities are centralized, and they obtain remarkable results in training, the improvement of library inter-lending, and in publishing a CD-ROM of bibliographical records from participant libraries for effective use.

- ★ Cooperation is a way to accelerate the evolution of libraries, and to create new services, to facilitate changes, and to save expenses. The library networks are developed to connect the libraries, which ensure the development of union catalogue with location.
- ★ In the era of the Internet, electronic documents, and the virtual library, maintaining independent libraries is out of order. In addition, the efforts needed to face the challenges of the information society and the changes that society is demanding of universities are destined to become weakness more than strengths in those institutions that face them individually. There are many reasons why it is advisable for libraries to approach these challenges collaboratively.
- ★ The huge technological opportunities to share information.
- ★ The high cost of the e- journals.
- ★ Growing demands of library users.
- ★ The ultimate goal of cooperation is to join users and documents with information they need.
- ★ Consortia represent the possibility to test alternatives to the traditional automated library. They represent the potential to offer the best library services to a wider number of users with all the resources they possess.
- ★ The successful operation of a library consortium clearly depends on good working relationships among members and between members and the consortium.
- ★ One of the significant challenges facing academic libraries during times of dynamic change is the ability to understand the needs and perspectives of their users.

Following the automation initiatives, the network technologies and data transmission development, most college libraries have made projects for all information resources integration and maintain a wide group of services viz. campus wide networks, catalogs, databases in CD-ROM, e-

mail, and remote access via Internet. Access to all resources is available through the libraries management system through its web OPAC. There is an access to these resources from any point connected to the network.

Component of Integrated college library and information system

Information resource sharing

The voluminous growth of literature published in almost all areas, the increasing cost of information resources and developments in the technological tools, offer new methods of information storage, processing, retrieval and dissemination. The process makes the sharing of resources a necessity. The library cooperation is old concept and a form of resource sharing.(Kaul,1999). Need of resource sharing was realized by libraries long back through cooperative acquisition, cooperative cataloguing, cooperative classification etc. Inter library loans has been practiced by the libraries as one of the most popular resource sharing activity. The limitations such as apathy of the lending library, distance, language, time etc. are resolved to a certain extent with the use of computerized inter-library loan systems.

For resource sharing the participating libraries must come together and cooperate mainly for collection development and providing effective services. Developing shared resources (Dhawan, 1999) is of grate importance and central to the concept of resource sharing. For developing the shared resources, the focus should be on first to eliminate duplication in the acquisition of costly contents to the extent possible. Secondly focus on the selection of agreed set of publications can benefit large population.

Resource Sharing and Networking models

It has been evident that, for the last two decades libraries have witnessed the impact of information technology, which is affecting the structure of the services of the college libraries to a great extent with the expectations

of users growing. The libraries have also been challenged by the problems of space, standardization, professional development of the staff, challenged posed by the new technologies, drastic cuts in the library budgets, devaluation of Indian Rupees and its impact on the library acquisitions can best overcome upon by the use of computer and communication networks for resource sharing. The use of national and international databases through communication networks and introduction of access to full text sources through cooperative acquisition programmes are the major issues (Kaul, 2001).

The resource sharing networks have various levels such as local, regional, national and international. In local levels the information is stored in the local libraries in the form of union catalogue. Similarly the regional level includes the information stored in regional libraries and services provided. In national level programs the union catalogue is prepared on the national basis and services are provided to users based on national resources.

Resource sharing in developed and developing countries

Library networks have grown mostly during the last thirty six years in different geographical environment in order to cater to the specific needs of the users. In the United States there has been a proliferation of them. Library networks in other countries are also growing. Several models have emerged that 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 resource sharing tools like union catalogues, rationalization of acquisition and maintenance of International standards for creation of records uniformly. Libraries should be able to join different types of networks depending on the need and select a model, which conforms to its requirements (Kaul, 1999).

In the developed countries resource- sharing networking was started long back. For instance the growth of networks in the United States can be traced from mid of 1960. USA is the birth place of library networking and by now libraries in each state is networked to local, regional and national network. It is important to note that the US Department of education has been advocating a vigorous policy for promoting library networking. It offers networking grants, support inter- library loan projects, automation and retro- conversion projects, resource sharing schemes, etc. besides providing regular federal grants annually to the public and academic libraries. Resource Sharing works in UK is also well established. The best example is Birmingham Library cooperative Maintenance Project (BLCMP) in Birmingham, has 13 million bibliographic records of books, serials music etc. in its database and its catalogues get a hit rate of above 90 per cent with more than 60 libraries comprising public libraries, college libraries, national and special libraries. BLCMP has introduced EDI clearing house in about 25 libraries. In Australia the resource sharing tools have grown from catalogue cards to national databases with the contributions of many older and larger libraries. In Australian Bibliographical Network, the national and central bibliographic databases are maintained and coordinated and maintained by a national agency. The Swedish Model for resource sharing is called the Consortium Model. This model is developed only for six major science and technology libraries in Sweden.

The developing countries like India are lagging behind in library co-operation. The reasons for the same are poor funding and the non-existence of the spirit of give and take or exchange is delaying the prospects of resource sharing programmes. The practice of resource sharing in the Republic of china (Taiwan) has been as limited in scale as has been in India. Greater efforts have been made in china for the development of documentary information resources because it was considered that these resources would work as China's knowledge

reserve to promote the development of economy, science, technology and culture. The main efforts were made on the rational distribution of the resources with the adoption of new technology. In some countries, resource sharing has become an important library programme such as in Thailand. In the 1970's work on the creation of bibliographic tools such as union catalogues and union list of serials had begun but in the 1990s networking was considered to be the main tools for resource sharing. Best examples are MOSTE (Ministry of Science Technology and Environment) library network and CHULALINET (Kaul, 1999).

The growth of library networks India can be ascertained to the initiatives taken by NISSAT in establishing CALIBNET in 1986, DELNET in 1988 and other networks subsequently. University Grants Commission (UGC) established national network INFLIBNET in 1988 for academic libraries. No efforts have been made to network public libraries since it is becoming essential to provide networked information to the public. Over the years, the programme has progressed steadily and since May 1996 it is an independent autonomous Inter- College Centre under UGC to co-ordinate and implement nationwide high-speed data network using state-of-the-art technologies for connecting all the college libraries in the country. INFLIBNET is set out to be a major player in promoting scholarly communication among academicians and researchers in India. More importantly INFLIBNET has been able to create an IT conscious environment in the college libraries. Librarians have now accepted and are eagerly working to bring these changes in their libraries. There are several other library networks at the city level viz. ADINET for Ahmedabad, BONET for Mumbai, PUNENET Pune, HYLIBNET for Hyderabad, and MALIBNET for Madras etc. offering services to participating libraries.

Implementation and Management issues

The most complex process of all is implementation. Strategic vision provides the framework or context for the next step in the automation process, which is to determine which library functions should be automated and in what order of priority. Determining the functions that a library wishes to automate and their priorities relative to each other is important for all sorts of reasons. If needs and priorities are clear, function can be automated in phases, allowing for more effective use of frequently scarce funding.

Training Service Priorities into System Specifications

Library needs to re-formulate functional priorities into “Functional specification,” which may be defined as what an automated system can do to enhance the existing operations and services, including things that are performing manually as well as through automated systems. Technical specifications include standards that must be adhered to system performance, operation, and maintenance as well as infrastructure requirements such as stable sources of electricity and telecommunications, and sufficient bandwidth.

Developing clear and accurate functional and technical specifications that are specific to the library is one of the most important activities that it engages in a plan of automated system. These specifications will carry through the entire procurement process, and will ensure that the system which most closely matches them will be the most useful and most responsive to the library needs. The Technical and supported services of ILMS has been placed below in Fig. 14 for a clear vision of the relevant information.

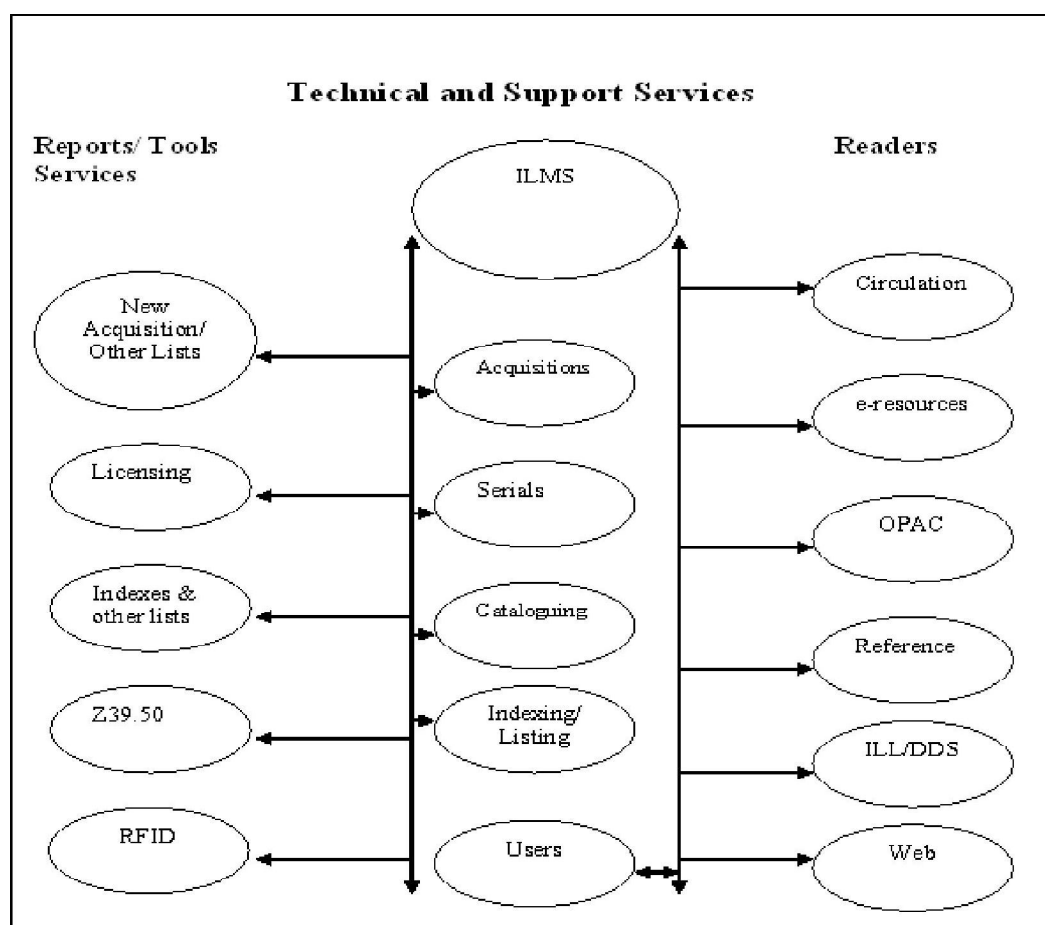


Fig. 14: Services by Using Integrated Library Management System

4.13 Developing a formal Specifications Document

It is very difficult to compare systems sensibly and practically exclusively by randomly looking at systems, talking to sales representatives, reading literature or comparing broad cost quotations. For this reason, libraries use a formal document often known as Request for proposal (RFP) that organizes and standardizes the information provided to and requested by the various system vendors. Utilizing an RFP to solicit written responses from vendors makes it possible for libraries to systematically compare functionality, cost, maintenance, support, and all other issues that are involved in system procurements. The process can save money and will result in a wiser decision.

Selection

Major changes in the procurement of an ILMS include the shift of focus from detailed micro-functionality of ordering, cataloguing and circulation towards the customer service aspects and customer empowerment features of the system. Along with this shift in focus there is a redefinition of what the “core” features include. The proliferation on third-party interoperable products has assisted in this redefinition by giving the libraries options for managing various business processes.

There are many vendors of integrated systems. While it is possible to identify market leaders among the vendors, it is not possible to say which of the available systems is best. Such a determination would have to be based on a thorough understanding of the library for which the system was intended and of that library’s needs and resources. Still, the number of systems which a vendor has installed is one measure of success and quality. Other measures include the level of customer support provided and customer satisfaction.

Cost

Cost is one of the first considerations of most library system purchasers. Costs include not only the initial purchase price, but also license fees, system maintenance and up-keep, database manager training, user training, upgrade fees, physical facilities, database conversion and storage, information delivery, staff training, documentation, and users’ groups and conference fees. A vendor contract should outline all system installation, licensing, conversion and maintenance costs. Clearly outlined responsibility for each cost item in a contract insures that costs will not be underestimated or run over budget. A careful research into vendor’s prices and judicious contract negotiation produces advantageous purchase prices.

Consortium Approach

This refers to any local, state-wide or regional co-operative association of libraries and /or allied organization, e.g. college libraries. Acquiring an ILMS through a consortium potentially saves libraries money, compared with the alternative of each library supporting an individual installation. There are also saving through shared systems support, cooperative cataloguing opportunities, and other areas. These need to be balanced against the reliance on an external consortium for hardware and support, reliance on external infrastructure for data traffic, requirement to fit in with consortium priorities, limited customization and potentially limited flexibility.

Training

Training the library personnel and providing facilities for hands on experience in using computers are important aspects to be given serious consideration. Continuous training on emerging technologies is necessary to develop, maintain and improve skills, knowledge and competencies. An intensive need-based practical oriented training should be imparted to library personnel to install confidence in them so as to enable them to handle and manipulate new technologies. Training may add to the cost of an ILS, but lack of sufficient training is a more costly road to project delay and failure.

Importance of Assessment

Having used for a considerable period of time after implementation, evaluation needs to be carried out to assess the extent to which the new technology meets the goals and objectives set for it. The evaluation should include assessment of hardware, software utilization, staff and user's perceptions about the new system and services and fulfillment of the library's needs and objectives. The staffs and users suggestion will be used as an input for future improvements.

Computer and information technology together represent a fundamental change in the way libraries function, libraries must make an ongoing commitment to keep pace with time. Periodic evaluation of automated systems should be carried out. Plans must be regularly revisited and updated as the environment and needs change.

4.14 Models of an Integrated College Library & Information System

The model of an Integrated College Library and Information System is likely to have three major components viz. a. Model Automated System, b. Model System for Information Services and c. Consortia model for electronic resources. The required efforts for each of these components have been discussed below.

Model Automated system

A model automated college library and information system is essential for managing information technology in the college library system

This model, however, can be developed with the following objectives:

- Automate all functions and maintain a comprehensive automated library system.
- Campus networking for connecting all the departments with library and Maintain LAN/ Campus LAN / and a wide area network.
- Maintain contracts with two Internet Service Providers and regularly evaluate performance.
- Seek to conform to all relevant standards.
- Create all library records in Machine Readable forms using standards.
- Provide online public catalogue access to within & to campus users and provide access to other library catalogues.

- Provide one or more “electronic access centers” in each library.
- Maintain an own website.
- Negotiate for online reference services.
- Provide Document Delivery Service including electronic document delivery.
- Provide access to academic information viz. admission procedure, examination system, evaluation, scholarship, etc.
- Upgrade skills of the staff by training and orientation time to time on implementation of latest IT tools.
- Designate a full-time system manager.
- Phase in implementation over a period.

The library system will maintain an automated library system which supports the internal automation of acquisitions with online ordering; serial control with online claiming; cataloguing with authority control and bibliographic utility interface; circulation with off-line backup, patron telephone and e-mail notification, and telephone renewal; and patron access catalog etc.

The automation of acquisition, circulation, and catalogue and serials control will make it possible to enter purchase requests in branches and issue them from central location; and it will make it possible to handle serials check-in in branches while handling claiming and invoice payment at a central location etc. Staff and patrons will have absolutely current status information about that which is on order or has been received and it will be possible for a patrons to place a “hold” or “ reserve” against on-order or in process materials. It also will make it possible to determine the latest issue of a periodical, which is available for use

The cataloguing module may also be linked to a bibliographic utility (e.g., OCLC, RLIN, and WLN). The database will be complete, including not only the book collection, but also bibliographic records for periodicals and non-print materials.

Circulation should be configured with off-line backup so that the library can continue to charge and discharge library materials when the host or server is not available. Circulation will also include patron telephone and e-mail notification for over dues and recalls. Telephone renewal can be made available.

An information & referral module also needs to be included so that the staff and patrons will know which agencies in the community provide what services to whom, and what terms. The library will emphasize that its reason for automating its internal operations is to improve service to patrons, not to reduce costs.

Campus Networking for connecting all the Departments with Library and Maintain LAN/Campus LAN/ and WAN

A Campus Networking for connecting all the Departments with Library along with maintaining LAN/Campus LAN/ and wide area network has become imminent in view of accessing and distributing wide range of information to its patrons and users.

Remote sites need to be connected to the central site for access not only to the automated library system, but also to other electronic sources such as a CD-ROM server, an Internet server, an image server, and possible other servers.

Because of the bandwidth needs will constantly be changing, a highly scalable technology is required. The WAN will incorporate a LAN in each library facility. Each will utilize category 5 UTP (unshielded twisted pair) cabling. The topology will be Ethernet. Routers will connect the LANs to the central site via the WAN.

Maintain contracts with two Internet Service Providers and regularly evaluate performance.

Contract can be maintained with two Internet Service Providers (ISPs) for staff and patrons access to the Internet. The reason for contracting with two ISPs is that it will make it possible to connect no more than half the staff and patrons to any single ISP- something, which is necessary because the service inevitably deteriorates due to the ever increasing number of users which can outstrip the ISP's capacity. The library will monitor performance not only by soliciting patron feedback, but also by having public service staff log on during known peak periods of activity. The ISP must offer the library rates, which are lower than those extended to individuals. Under the circumstances the number of concurrent users of the Internet exceeds 20; the library may install an Internet server. It may mount the software on the same hardware platform as the web server.

Seek to conform to all relevant standards.

Conformity to all relevant standards is a high priority. All cataloging will conform to the Anglo-American Cataloguing Code, Second Edition (AACR-2). The database of the automated library system will be developed and maintained in full-MARC format, including bibliographic, authority, holdings, and patron records. UNICODE compliance to be sought to facilitate multilingual user interfaces.

Create all library records in Machine Readable forms using standards.

Creation of library database is one of the prerequisites for success of automated systems. Using the relevant standards such as MARC 21 and AACR2 formats the library records are to be created and provide access to library resources. The records so created using the set standards will facilitate easy exchange of records from one library to other library at local, regional, national and international level sharing of resources.

Provide online public catalogue access to within & to campus users and provide access to other library catalogues.

The access to library catalogue and its resources is done through the user friendly online public access catalogue within the campus or to the outside users. This facility ensures that the users gets an access to information such as the holdings of different type of materials in the library of their interest and its availability, shows the status of an item, facilitates the reservation etc. The OPAC will also provide access to information relating to due items with due date etc. OPAC user can also see the status of receipt of latest issues of a scholarly journal in the library. The access to other library catalogue is equally important when the item required by the user is not within the campus or library, he/she may try to access the availability of such items in the nearby libraries where from one can borrow for a limited period using the inter library loan etc. Hence access should also be provided for other library catalogue.

Provide one or more “electronic access centers” for patrons in each library.

The electronic access Centers play an important role in the college system as the end users expect the central library to provide such facility even at nominal cost. The library will provide one or more “ electronic access centers” – cluster of PCs which provide access to variety of electronic publications, whether mounted on local automated library system, local CD-ROM towers, another library’s platform, or an online reference service. The resource accessible through such centers will complement the library’s print collection, rather than replacing it. While the most widely consulted electronic publications today are indexes and abstracts, an increasing number of reference publications and full – text/image files of journal articles are becoming available. The Internet, especially that part of it known as the World Wide Web, will be available from all “electronic access centers,” but the emphasis will be on

identifying the most appropriate sites for patrons, rather than facilitating aimless “surfing”. The users may also be provided e-mail and web-surfing facility through these electronic access centers. Patrons will also allow downloading to their own diskettes, but not allowed to load their software onto these machines. Instead, separate machines may be provided for word processing, resume writing, tax preparation, and other software applications. Each electronic access center may be configured to also support multimedia access. Multimedia is a combination of television, personal computing, and optical storage, such as CD-ROM or laserdisc. An enhanced PC which conforms to the multimedia standards can retrieve not only bibliographic files, but also full-text files, still images, audio, and motion images.

Maintaining an own Website.

Rather than limiting what is available to remote patrons to the patron access catalog, the library will maintain a Web site of its own and links to its automated library system, products on its CD-ROM server. The Web server will be configured with a “proxy server” firewall so that those accessing the libraries’ automated library system or other servers will not have direct access, but will interact with the firewall, and it in turn will interact with the target system.

Negotiate for online reference services.

The library cannot afford to purchase all electronic publications, which may be of interest to its patrons, nor would it want to purchase those not used frequently enough to justify the subscription price. The library, therefore, will continue to augment its CD-ROM collection with access to an online reference service. Among the services, which may be considered are those offered by EBSCO, IAC, OCLC, OVID, UMI, and H.W. Wilson, Elsevier etc. There is increasing price competition; therefore, a competitive procurement will be pursued. The service is to be

quoted for a specific number of concurrent users, with the number to be equal to half the number of "electronic access" devices in the library. Prices will also be required for additional concurrent users. The library will require an option to renew at no increase in rates for a second and third year. The library will periodically compare the cost of electronic products which are available both from an online reference service and a CD-ROM publisher or distributor in order to be sure that it has been chosen the most cost-effective approach to providing information in electronic form. While an online reference service provides full-text for some titles, many will continue to be supplied from the library's own collection. The identification of what is available from the library's own holdings is facilitated by the serials control module of the automated library system. All holdings, including the most recent check-in information, will then be available to patrons and staff.

Provide Document Delivery Service including electronic document delivery

Providing document supply and full-text access to online databases plays significant role in the shift from "ownership" to "access". The escalating costs of science and technology journals, budgetary constraints, and availability of science and technology literature via non-traditional sources, such as commercial document supply and full text online databases, are reshaping academic library's science and technology collections, as well as the modes of accessing and delivering scientific information.(Bandyopadhyay,1999).

ARIEL is a high-speed, high-quality, cost-effective document delivery system that runs on the Internet. Journal articles can be sent from one place to another by scanning the article directly from the journal. Text and graphics are digested into the computer, transmitted over the Internet, and printed on a laser printer at receiving end. Developed in 1990 by the Research Libraries Group of the Research Libraries Information Network,

ARIEL is becoming the document delivery system of choice for rapidly growing number of users in the USA and abroad. The key advantages which ARIEL has over the fax are: no long-distance phone charges; high image resolution; original source can be scanned; can send and receive documents at the same time; does not required dedicated equipment; and documents can be stored and forwarded at a later time. ARIEL version 2.0, released in February 1997 and version 3.1 in 2002, incorporates Multi- purpose Internet Mail Extensions (MIME) technology, which enables documents to be transmitted to the computer screen via e-mail from one individual to another. The college library can provide the document supply using the Ariel software (Landes, 1997).

Provide access to academic information viz. admission procedure, examination system, evaluation, scholarship, etc.

The college library and information system works as a model for access to information including the administrative matters etc. The end user should be able to find out the details of the admission procedure in the college system with criteria for selection of students, number of seats in each subject, online application, online results, scholarship details, hostel facilities etc. Though these databases are individually maintained at different places in the college, the integrated system is expected to provide access to such information and updated time to time.

Upgrade skills of the staff by training and orientation time to time on implementation of latest IT tools.

Staff must be trained to handle their new responsibilities. As systems become more complex, staff training increases in importance. Training can be limited to small groups to provide both hands-on experience and close monitoring by the trainer. This core group will then train others in the library. Online reference services also provide training, but it usually is done regionally, rather than on-site at the library. The library will seek to send a group of two to six staff to such training, and will have that group

train the others. CD-ROM products generally come without training; therefore, the library will assign a staff member to become familiar with each product using the manual and hands-on practice. The staff member will then be asked to demonstrate the product to other members of the staff. Training programs will not generally be offered to patrons, but the library will maintain a roster of local training organizations. The library will provide regular orientation sessions to patrons in the use of the automated library system, the Internet, and CD-ROMs.

Designate a full-time system manager

The library will designate a full-time system manager who has responsibility for acting as liaison between the staff and the vendor. Appointment of the system manager ideally occurs before the vendor is selected. The person selected as a system manager need not be knowledgeable about electronic data processing but should understand the functions of the library's entire department and have good interpersonal skills. The system manager will have to reconcile the library's needs with the capabilities of the vendor, coordinate standards development, implement new system features, oversee vendor compliance with the contract, etc.

Phase in implementation over a period

The components of the plan can be implemented over a period of time. Reasonable amount of time is required not only for financial reasons, but also because library staff cannot be expected to do everything at once. It also is not practical to develop a plan, which looks further into the future because the rate of change is too rapid. The plan has to be updated each and a detailed schedule of activities may be drafted. It will include updated specifications and cost figures.

Model system for information services including consortia activities.

To provide modern information services with the use of information technology tools, a model system is required which provide services using

automated library systems, CD-ROM, online reference services, the Internet and networks.

Automated Library system

By the end of 1997, over 13,500 commercially developed integrated, multi-function, multi-user automated library systems had been installed in libraries worldwide, primarily in North America, Europe, and Australia. There are considerably number of integrated library management software have been developed by various agencies viz. SOUL by INFLIBNET, LIBSYS, LIBRIS, ALICE for windows, SLIM, TLMS etc. Almost all of these systems support cataloguing with authority control, an online cataloguing support system interface, circulation, and a patron access catalog. There has been significant development in the automated library systems available commercially. A majority of these also support acquisition and serial control.

CD-ROM

CD-ROM has become the most popular form of access to electronic publications in the past decade. Advantages of CD-ROM mainly are the speed of replication from a master, low manufacturing cost, and ease of shipping. Its disadvantages are the lack of currency and relatively slow data retrieval time; however, the drives in the market now are rated at 48x through 52x (48 to 52 times faster than those available in the mid-1980s).

CD-ROM has not displaced the much longer established online database services, although it has changed their use. In the mid-1980s, almost all searching done in libraries was done by librarians accessing databases stored on remote systems such as Dialog; in the mid-1990s, most searching done in libraries was by patrons accessing titles on CD-ROM, and searching for highly current information was done by both librarians and patrons accessing databases stored on remote online database service systems. In the past two years end-user searching by patrons on remote online database services has increased dramatically, primarily

because of the availability of the full-text of periodical articles. While the 600 MB per disc capacity of CD-ROM had been an advantage for more than a decade, it became less attractive when electronic re-publishers began to offer collections of full-text periodicals consisting of billion of bytes. Rather than loading multiple CD-ROM discs in a jukebox, libraries began to access these files on the re-publishers' database servers something that became economical as the result of the Internet.

CD-ROM technology is not disappearing, however, because it continues to become faster and less expensive. Most PCs are now configured with a CD-ROM drive. CD-ROM products sold only to libraries tend to be expensive and the price tends to go up if the product is mounted on a CD-ROM server so that several users can have access at the same time. Therefore, one must be careful to project usage and divide it into the cost to determine the cost per use.

Online Reference Services

The improvement of user interfaces and changes in pricing make it possible for libraries to make available access to online database services by patrons. OCLC's First Search, the fastest growing of the patron-oriented remote database services, increasingly called online reference services, saw the number of searches against its databases increase from a half-million per month in 1994 to several million per month in 1998. Over 10,000 libraries in more than 60 countries use the service. EBSCO, Information Access Corporation, Silver Platter, UMI, and H.W. Wilson, Elsevier Sciences have become major online reference services. Services specializing in science, technology and medicine have also emerged.

Online reference services vary widely in price. Those that offer access to STM publications cost far more than those that offer access to popular periodicals. Most online reference services quote prices based on the number of concurrent users a library wishes to have access the service, but some base their pricing on the number of people a library serves or

the size of the library's acquisitions budget. Restrictions are common, including the limiting of access to persons within a library. It can cost considerably more when a library wishes to have patron access an online reference service from home or office through a library's automated library system or Internet server.

Competitive bidding has become an important aspect of online reference services. Consortia have been particularly successful in obtaining attractive agreements on behalf of their numbers. As the amount of money spent for access to electronic publications becomes a significant part of library budgets, libraries have begun to develop strategies for optimizing service and cost.

Document Delivery Services

A document delivery service provides hard copies of articles and other publications in response to a submitted request, usually online. In the opinion of many, document delivery is nothing more than providing the copies in lieu of the lending aspect of traditional interlibrary loan. The term "document delivery" was popularized by the commercial services offering rapid fulfillment of requests. Uncover, the largest document delivery service, provides an extensive online index to more than 17,000 serial titles and rapid delivery of hard copies by fax or overnight courier service.

Online reference services also offer document delivery, generally by downloading articles "full text" and sending them to a fax machine or a computer with a fax modem that is in image format. A library needs to compile and analyze data on the use of its print periodicals and its interlibrary loan and document delivery in order to determine the most cost-effective way to access each periodical title. Normally, any periodical of which the current year's issues are used more than five times in the year of publication is cost-effective to own, but if it is used less frequently, it generally is more cost-effective to obtain it from a document delivery service or an online reference service.

Electronic Document Delivery

The electronic document delivery enables a library to request another library for a copy of a document, to be transmitted via network facilities. This involves conversion of paper documents to electronic documents. Scanning and optical character recognition (OCR) technologies, which automatically put materials into electronic format, can help to speedup the conversion process. Apart from this there is an increasing trend to generate the documents in electronic format. This will help the electronic document delivery much easy.

Internet Services

The Internet is a worldwide network of networks connecting hundreds-of-thousands of computers with a common set of communications protocols. Of these protocols, the most important is TCP/IP, a layered suite which is similar to the Open System Interconnection (OSI) Reference Model which ten years ago was expected to become the standard for connecting heterogeneous computers with one another. Because of its use in ubiquitous Internet, TCP/IP has now become the standard for connecting computers within organizations. There are three major Internet capabilities: electronic mail, remote login (telnet), and file transfer.

Electronic Mail

The most popular service used is electronic mail facility. By enabling the immediate exchange of information with colleagues and participation in online interest groups, electronic mail facilitates formal and informal communication and enhances cooperation and collaboration in research and writing efforts. In addition to electronic correspondence capabilities, network users have access to hundreds of news and interest groups on a host of subjects. Network interest groups offer an outlet for ideas and opinions and serve as resource for posing questions to others on the Internet.

Remote Login (Telnet)

The Internet telnet protocol allows a network user to access a remote computer and use it interactively as if the local computer were a terminal of the remote host. Telnet requires minimal bandwidth; a 14.4 kbps modem is sufficient. Telnet provides access to online library catalogs, online reference services, and other online resources; however, the increasing use of graphics on the Internet means that telnet users are at distinct disadvantage.

File Transfer

The Internet File Transfer Protocol (FTP) allows network users to download files from databases residing at other sites. With any anonymous connection, Users gain access to valuable data in “archives” on a wide variety of topics. Supreme Court decisions and opinions, public domain computer software, medical resources, and public polling data are examples of the sort of information that can be obtained via FTP.

World Wide Web

The most significant aspect of the Internet beginning in mid-1990s was the World Wide Web (www). The Web refers both to servers on the Internet and to a body of information and an abstract space of knowledge. The Web has been described as wide-area hypermedia information retrieval initiative aiming to give unlimited access to a large universe of documents. Web operation relies on hypertext as its means of interacting with commercial users.

Networks

Many libraries have begun to pull together automated library systems, CD-ROM servers, and online reference services so that they can be accessed from a single PC- or Mac-based workstation. The user selects the information source to be accessed from a menu on the opening screen, and is connected to the information source, which may be within or outside the library

Network based Information Services

The central role of library is to promote and facilitate the effective use of recorded information in all forms by all of its clientele. Networks have potential to improve library services in several ways. The continuous improvement in the networking technologies helps the libraries to reduce the cost of information provision, thus creating new opportunities for the libraries to play their role in information provision to its end users. The information network must ensure that information can be found or delivered quickly from a large universe. The computer workstations in the libraries are now well equipped for dial-up and Internet access etc. Network facility helps libraries to provide Inter-Library-Loan by sending the Information through E-mail. The online ordering and acquisition related activities can be carried out. Networking with the development of union catalogues of different libraries is acts as boon to avoid duplication of holdings to the extent possible. Reference service can be enhanced with the use of Internet and e-mail facilities. CD-ROM Multimedia service can be effectively provided through Networks. The data communication though networks will be very high and helps users to obtain information within few seconds from anywhere in the world and sitting anywhere. There are several other facilities to improve the services with the use of network based information services to the end users.

Type of Network based Information Services

- ➔ Bibliographic Information Service
- ➔ Full text access to publications
- ➔ Organization of Internet Resources and provide access
- ➔ Provide access to information of Indian Origin
- ➔ Promoting the discussion forums for different subjects
- ➔ Consortia based Services
- ➔ Pattern Service etc.

Bibliographic Information Service

“Bibliographic services” includes- 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 the individual libraries and also the union database access provides the bibliographic details of an item held by the libraries. Bibliographic Information Service provides the patrons with access to databases from a variety of databases. This also includes the access to the database subscribed by the individual libraries in CD-ROM as well as the databases subscribed at the network center. The network helps the librarians to provide this service in a much better way to maximize the information services of the library and the network as well. Individual affiliated to networks have access to the databases developed at national and international level provides access to bibliographical details of the sources available with them. Libraries make effective use of the databases and provide better service to its users.

Full text access to publications

The existing collection too many of our libraries is not enough to meet the actual requirements of the academicians and researchers. To supplement the collection and to provide an access to large number of journals, and full text databases available in electronic form at an economical rate. A Network centre can play a major role in providing access to full text of publications to the member libraries. Full-text resources are the most sought after commodity in an electronic library setting. For students, scholars and the everyday user alike, all they want is what they want, when they want, where they want it. Full-text electronic resources offer access unrestricted by either location or library hours. In providing the bibliographic information service and access to full text of journals, number of issues involved as discussed below.

- ◆ Identification and selection of databases to be acquired in the network environment.

- ◆ Negotiating, pricing, getting access rights from the publishers / vendors
- ◆ Financial support for subscribing to these databases
- ◆ Licensing and copyright issues.
- ◆ Infrastructure facilities to ensure smooth and speedy delivery.
- ◆ Required documentation and training to the staff working in the library for providing such service

To tackle all these issues, it is advisable to have a network centre, which can act as facilitator for all the activities mentioned above

Organization of Internet Resources and provide access

Information on the Internet is growing every day. Lot of it is not found useful for academic and research work. Filtering the useful information, organizing it and providing easy access to the same will be a Herculean task. In the network based environment it is possible to venture into initiate the work of organizing the internet resources to buildup virtual library particularly for Indian resources and provide access to end users. In today's society, with skill, one can usually find much information on a particular topic. It is the challenge then to sift through this mass to determine what is reliable and appropriate and what is "junk." Whether the information appears in books, articles, Internet or TV one can't assume reliability. Evaluate all resources read. Users of the Internet were initially impressed that they found useful information of any kind. However, now that anyone with access to a server and a passing knowledge of HTML (Hypertext Markup Language) can put information on the Internet, the problem has become one of sifting through a mass of advertising material and vanity publications in order to find information of high quality. For librarians and library users to make effective use of the Internet, they need criteria to use in evaluating the information found.

Providing access to Information of Indian origin

Internet has provided an opportunity for access to ocean of information published on the web. But this data is mostly of data published from other countries. An emphasis on the data relating to Indian origin need to be given and access to such data is to be improved by the way of organizing access to such data of Indian origin. All those individuals and libraries using the network based information services in India agree that, Indian content is very limited. There are various reasons of not many databases are being created though efforts are on to add new databases to the network or available in India made accessible through the Net. In recent years some efforts are being made to create and develop the databases and web / home pages to hook up over the Internet to provide access to data of Indian origin. There is a need for creation of indigenous databases of various types in different subjects, and areas of importance to users in India. If these databases are once put on the web, rest of the users can access such data. An effort needs to be made to provide access to such data of Indian origin.

Promoting the Discussion forum in different subjects

In the networked environment, it is quite possible to create discussion forum in different subjects to help individual to interact with their own group of users working in their area of interest for problem solving and discussions among the users to enhance their skills by participating in the discussion forum. To facilitate exchange of ideas and promote communication among faculty members, students, researchers, scientists, engineers and academicians electronic discussion forum will help to interact with each other. This kind of service can be coordinated at national level by the national network agency in the subject concerned.

Consortia based services

Libraries in India have been affected by an uncertain financial environment in which resource buying has been restricted, causing them

to look at ways of extending their purchasing capabilities to compensate for reduced budgets. Library consortium is the one of the emerging tool. Kit for the survival of libraries. Network is essential partner in this exercise as it facilitates access to vast information services. Networks have potential to improve library services in several ways. The continuous improvement in the 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 its end users Consortium based services is the way of maximizing the resource base in the developing country like India. In the networking environment, it is quite possible to provide the consortia based services with the coordinating agency. Libraries in India have been affected by an uncertain financial environment in which resource buying has been restricted, causing them to look at ways of extending their purchasing capabilities to compensate for reduced budgets. Library consortium is the one of the emerging tool kit for the survival of libraries. Network is essential partner in this exercise as it facilitates access to vast information services. Networks have potential to improve library services in several ways. The continuous improvement in the 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 its end users.

The Consortia based services helps to

- Increase the cost benefit per subscription.
- Promote the rational use of funds.
- Ensure the continuous subscription to the periodicals subscribed.
- Guarantee local storage of the information acquired for continuous use by present and future users.
- Develop technical capabilities of the staff in operating and using electronic publication databases.
- Strategic alliance with institutions that have common interest resulting to

- Reduce information cost
- Improve Resource Sharing

Consortium based services is the way of maximizing the resource base in the developing country like India. In the networking environment, it is quite possible to provide the consortia based services with the coordinating agency. The above components in respect to automated system and system for information services has been shown in the typology for Integrated College Library and Information System placed in Fig. 15 on next page.

4.15 Topology for Integrated College Library and Information System

➔ The pre-requisites of an integrated college library and information system.

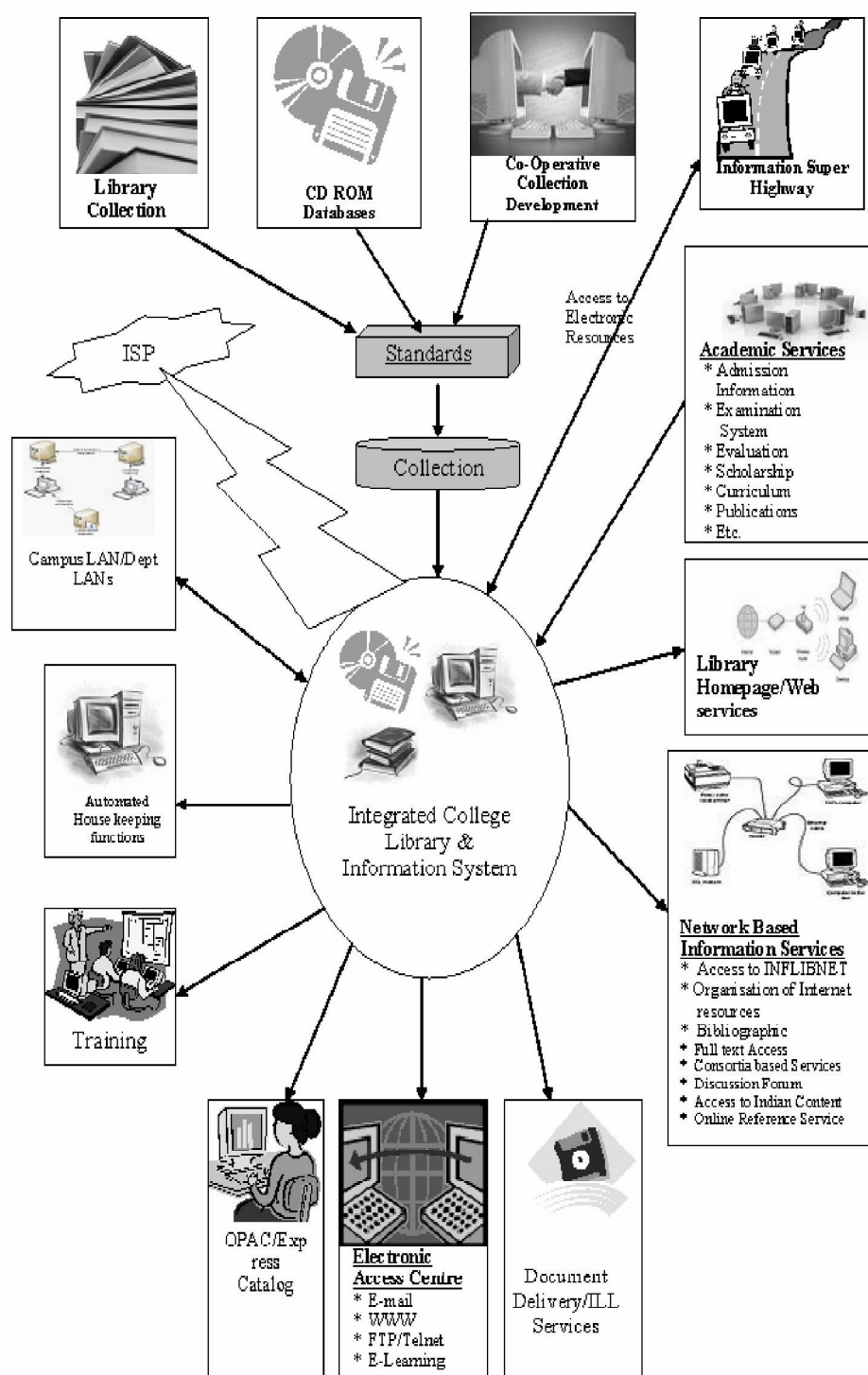
The design of an Integrated College Library and Information System has been described in following subheadings;

Input resources

The collection of college library is one of the important components for providing the effective services to its clients. The collection of the library viz. books, thesis, journals, standards, patents, reports, etc will have access through quality check. These items will have an access with the use of bibliographic standards. The second type of collections viz. CD-ROM databases etc. for providing the electronic access to resources. Many libraries procure the CD ROM databases to provide the abstracting and indexing services. The third type of collection of the library will be cooperative collection development using the consortia approach or e-subscription. All these collections are likely to pass through the standards adopted by the library. The college library will also like to provide access to information super high way for providing access to other resources but

this does not cover under the collection of the library however the library provide access to these resources.

Fig. -15
Topology for Integrated College Library and Information System in Mizoram: A Model



Campus LAN

In order to provide services through library, college system must have a Campus LAN connecting the departments to the college library. The department gets access to not only the collection of the library but also access to other library resources and electronic access to scholarly resources.

Access to Academic Services

The college library will act as resource centre for academic information viz. admission information, examination system, evaluation, scholarships, curriculum of the different courses, and access to publications of the universities. Though the information is updated at individual servers, and work carried out by the college administration, but the access is given from the library website or library.

Electronic Access Centers

The model college library system is likely to provide the electronic access centers in the college library to act as information kiosks. These centers are also likely to provide email facility, Internet surfing etc.

Out put – Services

An Integrated College Library and Information System with the inputs discussed above will provide integrated solution to the requirements of the users. The OP AC access / Express catalogue will provide access to not only the collection of the library etc, but also link to the status of collections, library profile, announcements etc. Document delivery including electronic document delivery will be provided by library. In the networked environment the college library and information system will provide network based information services viz. Bibliographic, full text access to resources, organized internet resources, establish discussion

forums, access to resources through consortia etc. The library will maintain its web page and provide web services. In the networked environment, the integrated college library and information system will take care all the functions to provide the one system, one library concept, thus providing one stop solution to the user requirements.

4.16 Conclusion

An effort has been made in this study to identify the pre-requisites for a college library system to work as an integrated college Library and Information System capable of providing one point solution to the end users. The Government or corporate sector must take lead in developing such a system and provide comprehensive solution to the existing situation. Many efforts made by different countries to develop an Integrated library system which are discussed in the review chapter shows that, most of them have designed the system with a specific purpose of providing integrated solutions to the requirements of their proposed users. However it is found that these systems are not comprehensive as expected and they are of commercial nature providing solution to limited area of college system. NOTIS Northwestern Online Totally Integrated System (1982), Georgetown College's Library Information System(1983), DOBIS /LIBIS on-line library automation system (1984), Tamkang Automated Library Integrated System (TALIS) (1988), LIBERT AS integrated library system(1990), The Slovak National Library Integrated Library and Information System (1992), GRIBSINFO integrated information system, Voyager integrated library system, California(1993), CROLIST integrated library system(1994), PALS integrated library system(1995), Agricultural Library Network of Sri Lanka (AGRINET) has developed an integrated information system (1997), SIRS Mandarin is a fully integrated library system (1998), Horizon integrated library system (1999), Columbia Library System etc are some of the examples of Integrated Library System. The Technology Resource

Foundation has announced Open Book (2001), a free, Web-based integrated library system that offers flexible, sophisticated automation to small to mid-sized public or school libraries are some those. Libraries have always been concerned with public service and access to collections. Traditionally, service and access have been provided on an as needed basis to those people who actually enter the library building – This approach allowed librarians to help those who had a specific and defined need for information and defined the library as the place to go for help. Networking technology has had very real implications for information services and "Academic institutions and their libraries were early beneficiaries of national electronic networking initiatives" (McClure et al., 1993). With the advent of library systems, library collections became more accessible within the library and outside the library. Libraries made the transition from the card catalog to the online catalog, allowing electronic access to the information and making keyword searching a real possibility, a real boon to novice library users. Telnet and gopher access to libraries were the first popular manifestations of information-sharing and communication technologies, allowing remote access to collections and predicting the global information networks available today. Thus an integrated college library and information system serves the one point solution to the end users.

The library management system provides the essential infrastructure which enables the modern academic library to deliver its services. At present many good software packages are available for library automation in India. Preferably library software which follows international standards should be procured in the libraries only. However, libraries should be prepared to meet the new challenges. They shall have adequate understanding about the hardware and software options available. Individual efforts have to be replaced by coordinated and collective national/regional efforts. All libraries should use standard software

packages for automation, for in turn it will help in resource sharing between groups of libraries.

During the next few years and beyond, libraries will operate in an increasingly interconnected world. Librarians will be compelled to find ways to put materials from the emerging global library into the hands of their clients and be ready to quickly supply materials, regardless of format, from their own collections to both local and remote users. Libraries will have a global customer base, requiring movement from a model for “just in case” acquisition of materials to model for “just in time” delivery of information and materials with an emphasis on customized provision of information. Adoption and application of Information and Communication Technology in libraries in general and in college library in particular have tremendous impact on delivery of library and information services which have been discussed in detail in following chapter-5 entitled “Impact of ICT on college library and Information Services”.

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Chapter-5

**IMPACT OF ICT ON COLLEGE
LIBRARIES AND INFORMATION
SERVICES**

5.1 Introduction

The advancement of science and technology has made unparalleled improvements especially in the field of library and information services. Information Technology (IT) is a term which is used to describe the equipments (hardware) and computer programs (software) that allow the libraries and user communities to access, store, retrieve, organize, manipulate and present information through electronic means. It is the electronic storage, processing and display of information but not necessarily the transmission of information. IT is the field of engineering involving computer based hardware and software systems and communication systems to enable the acquisition, representation, storage, transmission and use of information. Information and communication Technology is the convergence of Information Technology and communication technology. ICT is a combination of networks, software and hardware as well as the means of communications, collaboration and engagement that enable the processing, management and exchange of data, information and knowledge. The technology required which is adopted for information processing and dissemination of information. In particular the use of computers and computer software's to convert, store, protect, process, transmit and retrieve information.

Application of Information and Communication Technology (ICT) has dramatically altered the library services in global scenario with regards to organization, management in the field of libraries. ICT not only primarily holds the key to the success of modernizing information services but also has introduced new ways of information handling. It also brings about a sustainable change in accessing, structure, management and dissemination of information. The application of ICT has a far reaching impact in wide dimensions of library services in general but in particular, it is applied for converting the existing paper-print records in to digital form including the storage, dissemination and retrieval, etc. so as to make free

flow and exchange of information both nationally and globally. In academic libraries especially in higher education field such as college and university, ICT presents an opportunity to provide value-added information services and access to a wide range of digital-based information resources to their clients. Further, libraries are also using modern ICT to automate their core functions, implement efficient and effective library cooperation and resource sharing networks, implement management information systems, develop institutional repositories of digital local content, and digital libraries; and initiate ICT-based capacity building programmes for library staff and information literacy programmes for library users. However, for most libraries in India, use of ICT is largely restricted to traditional library automation, i.e. replacing manual operations by computerized methods. Innovative use of information and communication technologies in libraries is not widespread and it is made difficult, if not impossible, by several challenges or constraints, including lack of funds to sustain the ICT infrastructure, inability by librarians/libraries to keep up with the pace of developments in ICT, inadequate ICT facilities in the libraries, lack of staff with appropriate skills to manage ICT both at the strategic and operational levels, absence of institutional policies and strategies to support and guide the use of ICT, and lack of adequate knowledge and skills to manage digital information resources and to deal with issues relating to copyright intellectual property rights in a digital information environment. ICT have brought revolutionized the total library sector with regard to its management, services as already discussed. Conventional LIS such as OPAC, User Services, Reference Service, Bibliographic Service, Current Awareness Service, Document Delivery, Inter-library loan, Audio-Visual Services and Customer Relations could be provided more efficiently and effectively by using ICT, as they offer convenience of time and place, cost effectiveness, faster and most up to date dissemination and end user's involvement in the LIS processes. Impact of ICT on information services is

characterized by changes in format, contents and methods of production & delivery of information products, emergence of Internet as largest repository of information and knowledge, changed role of LIS professional from intermediary to facilitator, new tools for dissemination of information, shift from physical to virtual service environment, and extinction of some conventional information services and emergence of new and innovative web based LIS. Web enabled services are provided through library web page. New services include access to internet and internet based tools and services, access to electronic information sources and digital library of local and institutional documents. Journals, books, dissertation & theses, course material and patents are some of important sources of information that are now available in electronic form. Electronic resources provide 24 hours any where flexibility and convenience of use by multiple users and full text searches and faster delivery. The academic library finds itself in a time of tremendous challenge but it is also a time of boundless opportunity to use ICT creatively to enhance service delivery to the user.

5.2 Impact of ICT on College Libraries

ICT has changed the nature of academic libraries especially in colleges and universities. A variety of terms such as hybrid, digital and virtual library, library without walls are used synonymously to identify the academic library. In the chaining context, a digital library can be defined as a managed collection of information with associated services where the information is stored in digital format and accessible over a network. The virtual library, however, can be defined as remote access to the content and services of libraries and other information resources, combining an on-site collection of current heavily used materials both print and in electronic form with an electronic network which provides access to and deliver from external world wide library and commercial information and knowledge sources. While discussing about the hybrid libraries it can be equated with the libraries which provide access to both electronic

resources and paper based resources. From the above definitions it is clear that, most of the present status of academic libraries both in college and university fall in hybrid category. The Internet has proved to be an effective platform for information access and retrieval both simple and complex. Information retrieval systems are being designed to suit the need of end users and therefore, they try to simplify the process. Simultaneously, however, the user is overwhelmed with so much information resources and choices that the process become complex.

5.2.1 Impact of ICT on Collection Management

In this age of information explosion, electronic resources has made collection management a very complex and challenging task. Budgetary constraints, numerous formats, ever changing user needs, interdisciplinary research etc compelled the college librarians to adopt the means of ICT for collection development and management which implies involvement in tasks such as analysis of needs, negotiation of contracts and evaluation of ICT. Forever gone is the era when academic library's physical collection determined its stature. In the modern networked technological era the emphasis is shifted from ownership of physical resources to access to electronic resources that are globally accessible.

5.2.2 E-journal

The e-journal can be defined as a version of the traditional print or paper based journal which is disseminated electronically in some form or other directly to the user. Since it's inception in 1665 the printed journal remained the primary vehicle for communication among academics and researchers but there had been major increases in the cost of journal subscription during the last decades. The advent of the internet transformed publishing radically made it possible to publish cheaply.

5.2.3 E-book

E-Books are essentially published books and reference materials that were digitized and are distributed. From library point of view, e-books are cost saving in terms of shelving, binding, circulation, overdue notices and management of fines. Other advantages are on-line availability, key word searching capability, etc.

Impact on Users

Academic library staff has a good understanding of the tremendous value of printed and electronic resources available to students at academic libraries. Users do not necessarily have the insight. New generation library users have a preference for electronic resources rather than print resources. They want,

- ☛ All resources should be available in full text and printable
- ☛ The library service should be fast and easily accessible
- ☛ Round the clock availability of information
- ☛ On-line transaction of information.

5.2.4 Co-Operation, Resource Sharing & Networking

Co-operation is a social activity as old as human civilization itself. The aim of any cooperation activity is to achieve what the members of the group can not achieve individually. So library co-operation may be defined as a combined effort of two or more libraries to share their resources for providing better services to their user community.

While discussing the genesis of Library co-operation it is an age old concept which basically prevails in a traditional environment and it can be traced to 200BC when Alexandria Library shared its resources with Paragon Library. According to Kraus, there existed library co-operation among monastery libraries in the 13th century. There were exchanges of agreements among the universities of Lund, Abo and Greifswald as early

as 1740. The other examples of library cooperation include a projected union catalogue of the libraries of Weimar and Jean and a proposal for a coordinated acquisition scheme for Walfenbuttel and Gottengen. The 'Catalogue of Manuscripts in various parts of India' compiled by Whitney Stokes in 1868, and in 1863 Part I of Sanskrit manuscripts in private libraries of North-west provinces covering Varanasi was published. The first major union list entitled 'A Catalogue of Scientific and Technical Periodicals' was compiled by Henry C. Bolton in 1885. With the advent of the 20th century, the Library of Congress started co-operative cataloguing projects and began working on the National Union Catalogue. Thereafter, in the 20th Century the compilations and publications of union catalogues of different types increased in number in most countries.

The first library cooperation activity in India is reported to be the Catalogue of Manuscripts compiled by Whitney Stokes in 1868. Union catalogue development was one of major cooperative efforts in Indian libraries up to the 1960s. We can look at the following union catalogue development activities:

- 1918: - Catalogue of Scientific Serial Publications in the Principal Libraries in Calcutta compiled by Stanley Kemp, Asiatic Society of Bengal.
- 1931: - List of Scientific Periodicals in the Bombay Presidency, Royal Institute of Science, Bombay.
- 1953: - Catalogue of Periodicals in CSIR organizations corrected up to December 1953 CSIR, New Delhi. Union Catalogue of Learned Periodical publications in South Asia, vol.1: Physical and Biological sciences compiled by S.R. Ranganathan and others. ILA, Delhi.

- 1956:- Catalogue of Medical Periodicals in Indian Libraries corrected up to December 31, 1955. 4th ed. Director General of Health Services, Delhi.
- 1968:- A Union List of Learned American Serials in Indian Libraries, Indian Council for Library Development.

The 1960s also saw a large number of ILA and IASLIC national seminars devoted to the concept of library cooperation. However, with the advent of computers in library work, a change occurred. It is reported that the first use of computer in library work for the production of the Union List of Serials in 1964 using the IBM/602 machine at INSDOC. Since then library automation has been a matter of primary importance in Indian Libraries. With the establishment of the National Informatics Center (NIC) in 1975 and the development of NICNET in 1977, networking and communication technology in India received a major boost. This as a whole had a major influence in resource sharing among various libraries and information centers through networks. In 1984, the working group of the Planning Commission headed by Dr. N. Seshagiri recommended modernization of library services and inter linking of library systems in the seventh plan. The 1990s are said to be the golden period of library networking in India. There has been a plethora of publications and seminars on library networking during this period. Today besides INFLIBNET, there are various local library networks in India such as ADINET, BONET, BALNET, CALIBNET, DELNET, MALIBNET, MYLIBNET, and PUNENET etc.

It could be visualized from the above discussions that, the efforts made for library cooperation in the 20th century began with the compilation of union catalogues, as no co-operation could be effective without the knowledge of the resources of other libraries. The scope of co-operations soon took big leap. It became diversified and incorporated the various activities of the libraries such as Abstracting and Indexing, Acquisition, Bibliographic access, cataloguing, Circulations development, continuing

education for staff and users, literature searching, management and accounting, microfilming, photo copying, processing, referral services, storage and union lists.

5.3 Resources Sharing: Meaning, Need and Scope *Meaning*

A resource sharing is sharing of library resources such as document collection, staff members, technical facilities and mechanical aids among the participating libraries on the basic principle of cooperation, "All for one and one for all". In this respect it is possible to consolidate the document collection of participating libraries, exchange their technical capabilities and share their services. In this way it is possible to share the resources to provide on access to the vast amount of library and information sources to a larger user community at the least-cost. The objective of resource sharing is obviously to make the greatest amount of best information available to the most users at the reasonable cost.

Thus Resources sharing is a need-based concept founded on the sound principles of give and take. It is not the quantum of exchange but the real desire to do so, that is essential to become part and parcel of the important programme of resource sharing activities.

Need

There has been a voluminous growth of published documents in the recent part. As a result no library is able to procure, process or store all documents that its users demand. According to Kent " it is difficult to anyone single library to acquire even one percent of the total document published in the world" due to one or more of the following reasons:

- ➔ Growth of Knowledge in different subjects
- ➔ Rapid increase of literature and growth of publication

In the second half of the 20th century, the growth of new publication became unmanageable for traditional libraries. Its impact was felt

primarily in major programs and later by the smaller libraries. In the field of Science and Technology alone about three million documents are published each year which includes articles, conference papers, books, technical reports and these the rate doubles every eight to ten years according to V.A. Kamath. There has been an alarming growth lately in journal articles. According to Conen, two articles were generated in the field of sciences alone every minute or over 10 lakh articles a year. Also fast production of literature takes in different places in diverse formats and in multi dimensional subjects which amounts to the growth and development of

- ▶ Increasing trend of new born subjects and specialization
- ▶ Proper fund utilization with limited resources and
- ▶ Increase in the cost of publications

The resource sharing apart from the above discussions could facilitate to,

- ⇒ Increase in the number of members of user community teachers, scholars and students in universities.
- ⇒ Information needs of academic community could be enhanced in a wider form with profuse use

Lacking of information needs, technical expertise and environment to make use of available computer and communication technology for efficient and production use in libraries, resource sharing has become indispensable among the libraries for acquiring additional information in a specific subject with low cost as published records are increasing at an incredible rate. In this scenario, library cooperation acts as a viable platform for information exchange.

Scope

The idea of resource sharing for a long time was restricted to the area of lending of books and periodicals now it has become diversified and incorporated the various activities of the libraries such as abstracting and

indexing, acquisition, bibliographic access, Cataloguing circulation, collection development continuing education for staff and user, literature searching management and accounting, microfilming photo copying, processing, referral services, storage and union lists. The resource sharing in modern times is helpful in the following four main activities.

- Acquiring books*** - Selection, Ordering and Purchase, etc
- Recording books*** - Cataloguing and Classification
- Making them available*** - Library books by consultations and Lending of books by borrowing from other libraries.
- Storing books*** - For present and future use

Shared Acquisition

The shared acquisition involves procurement of books, periodicals and other materials from publishers and booksellers of foreign and own country through mutual agreement among the participating libraries. By the process of shared acquisition the saving of money and time, avoiding wasteful duplications and building up a sound and large cumulative collection is possible. The savings on this count may be utilized for further utilization of documents to enrich the library collection.

All the acquisition activities such as placing order, reminding the suppliers, passing bills and other activities, besides book selection can be reduced to a great extent through co-operative acquisition of documentation. This may bring down cost, care discount and save time and labor of individual libraries participating in the system. The various problems associated with subscribing foreign journals can be avoided through cooperative acquisition.

Shared Cataloguing

The processing of library materials is claimed to be the highest shares of bottleneck in library work and therefore, the librarians pay special attentions to the processing of documents well in time which form an

integral part of resource sharing. Mention may be made that, the shared cataloguing projects of USA, UK, Australia and Canada have shown the way for processing work which could be done very effectively, and economically which lead to save a lot of time, effort and money. The on-line computer Library Centre (OCLC) project and the Library of Congress shared cataloguing projects have shown how shared processing of library documents could be undertaken and how the individual libraries can save their time and labour.

Future Scenario

The future scenario of resources sharing could be termed as 'Global Resources Sharing interconnections' which not only mean the interconnection of among libraries through INTERNET and electronic publishing, but also could establish their growing trends which are felt at various regional groupings two. The present trend escorted to the gradual move towards greater integration of services and resources sharing.

Resource Sharing through Network

As indicated earlier, the past few decades have witnessed knowledge and information explosion the world over and inadequate financial resources to do the best in terms of dissemination of knowledge and information. Under these circumstances, resource sharing and cooperative functioning of libraries and information centers through networking becomes vital. Efficient resource sharing can be achieved by using recent advances in Information Technology, i.e. networking of libraries and information centers through Local Area Networks, Metropolitan Area Networks, and Wide Area Network and so on.

Network of information / Resource sharing is to use the computer and telecom link for transmission of information or data from one library to another. Keeping this concept in view, various library networks have been established for cooperation and resource sharing among libraries. They

have grown mostly during the last thirty years in different geographical environments in order to cater to the specific needs of users. In the United States, there has been a proliferation of them. Library networks in other countries are also growing. Several models have emerged that provide specific services. Not all networks conform to the essential functions of library networks. However, it is noted that the essential functions should include,

- ◆ Promotion of resource sharing,
- ◆ Creation of resource sharing tools like bibliographic databases such as union lists of serials, union catalogue of books, periodicals, bibliographic databases of articles and other types of materials such as CDs, Video recording, sound recording, theses, dissertations etc.,
- ◆ Rationalization of acquisition,
- ◆ Adoption of international standards for creation of records uniformly, and
- ◆ Delivery of documents, etc.

While discussing the Indian scenario like other advanced countries, economic pressures, enormous growth of publications and emergence of subject specialization compelled the libraries and information centers to adopt the principle of resource sharing the information resources including optimizing the use of existing resources within India as well as from abroad through various networking systems. Some of the notable networks in India are NICNET, ERNET, SIRNET, INDONET and INET. In addition, there is a major initiative from the University Grants Commission called INFLIBNET, interconnecting universities, colleges and resource institutions countrywide.

5.3.1 National Level Resource Sharing

As discussed, INFLIBNET, a national level resource sharing among university and college libraries was set up in 1986 under the guidance of

Prof. Yashpal Kapoor, the ex-Chairman of UGC, INFLIBNET is a multiple functions/service network which focus primarily on resource sharing and cooperation through computer communication links. Information and Library Network Center (INFLIBNET) established in a project in 1991 and incorporated as a Society in 1996 not only serves towards modernization of Libraries but also serves as Information Centre for transfer and access of information, supporting scholarships and learning and academic pursuits through a National Network of Libraries in around 264 Universities, Colleges and R &D Institutions across the country.

The users of the college and university libraries in India gain a substantial benefit from the services offered by INFLIBNET as it has created data banks in different subject fields, produce a number of bibliographical tools and information services. It is also possible to conserve a lot of library resource avoiding duplication at the national level.

But under the present conditions, it is not congenial to initiate a network of libraries at the national level, because all universities in India depend on the finance from central and state governments. The various universities have their own district characteristics based on factors such as geographical, linguistic and political. Each university library is following its own pattern and procedure in its routine work. For this reason, there is no uniformity and standardization. However, such a networking can be initiated in a limited environment, regional or state level.

5.3.2 State Level Resource Sharing

In India, formation of a network of university libraries in all states is possible only if the concerned administrative and professional staff and supporting agency make a sincere attempt in this direction. They should plan to co-ordinate programmes of all universities in the state to form a uniform academic calendar. They have to establish a body like Council of Higher Education to initiate a network of libraries in the state say,

KAULIBNET (Karnataka State University Library Network) in the interest of larger academic community. They should bring all the affiliated colleges within the fold of state level library network and extend the services to colleges.

It is not difficult to bring uniformity and adopt a standard procedure in all participating libraries within the state. After achieving the success in running the network at the state level, it is possible to link all such state level networks to the national level network. Further, it will not be difficult to link university libraries network with specialized networks in the field of library and information in India, using sophisticated modern technology and satellite facilities.

5.3.3 City Level Resource Sharing

Specialized library networks have come up for individual cities like DELNET, CALIBNET, MALIBNET, PUNENET, BALNET, ADINET, BONET, MYLIBNET, etc. These networks are meant essentially for providing a centralized database of library information to be accessed by its user libraries, mostly in a particular city for the purpose of resource sharing.

In the present day of limited resources, it is imperative that an integrated view of these networks and National Information Systems and Centers on the possibility of sharing resources among them should be taken to explore avoiding duplication of efforts, materials and resources and maximizing the utilization as they form the base for successful networking. Access through any network in the globe can be obtained virtually through INTERNET which is widely used international network.

Criticism of Resource Sharing

Resource sharing, despite its various advantages, has certain disadvantages too. The concerned critics have voiced on the following points,

- ☛ If all libraries depend on resource sharing, no library will have books to lend;
- ☛ If co-operative acquisition doesn't operate well, serious gaps in the collection of a library will result;
- ☛ Without the sophisticated technology, resource sharing would have very limited value;
- ☛ Cost consideration may not permit resource sharing;
- ☛ The reaction of the publishing trade, if their sale gets reduced;
- ☛ Large libraries have to share a greater burden of lender rather than borrower which is not beneficial to them.

The criticism of resource sharing is no doubt sound and partially valid. But there seems to be no alternative to this. The document supply service of National Institute of Science Communication and Information Resources (NISCAIR) which came into existence on 30 September 2002 with the merger of National Institute of Science Communication (NISCOM) and Indian National Scientific Documentation Centre (INSDOC) is an example which has been continuing for over the last four decades. NISCAIR sources approximately 28,000 orders annually.

Mention may be made that, One of the core activities of NISCAIR is to collect, organize and disseminate S&T information generated in India as well as in the world which has relevance to Indian S&T community. Under this programme, the institute is building comprehensive collection of S&T

publications in print as well as in electronic form and disseminating through traditional as well as modern means benefiting different segments of the society. Major resources under this activity are National Science Library, Electronic Resources, Indigenous Databases and Raw Materials Herbarium and Museum.

Hence, it can be summed up that, the library co-operation is the key to the successful functioning of a library and without it; it cannot provide effective service to its users. Without cooperation, it is impossible to start sharing of resources. We notice that the sharing of resources can help:

- ➔ Acquire library materials;
- ➔ Share holdings;
- ➔ Provide researchers with increased number of research materials;
- ➔ Avoid duplicate purchases;
- ➔ Ensure collection of special material and services;
- ➔ Establish efficient communication systems;
- ➔ Prepare union catalogue;
- ➔ Develop an information marketing mechanism through cooperation
- ➔ Control of the quality of collections.

5.3.4 Steps to Promote Resource Sharing through Network

As we have seen networking of libraries is essential for sharing of library resources, the same should be promoted at local, regional, national and international level. Following steps are to be taken to promote resource sharing through networks:

- Important libraries, information centers and institutions get their catalogues and bibliographies prepared in machine readable form to provide computer aided information services to users and promoting automation of the functions in their libraries such as cataloguing, circulation, preparation of bibliographies, union catalogue, etc.

- To promote sharing of resources among the libraries in India by developing and disseminating information and by offering computerized services to the users.
- To optimize information resources utilization through shared cataloguing, interlibrary loan services, catalogue production, collection development and avoiding duplication in acquisition to the extent possible.
- Encourage cooperation among libraries, documentation centers and information centers so that pooled resources can augment weaker resources centers.
- The promotion of non-bibliographic databases in India, especially by National Informatics Center has enabled institutions to perfect computer and networking technology.
- In house functions like acquisition, cataloguing, classification, serial control, circulation, SDI, current awareness services, etc; the network should support these library operations and the libraries should use the data in the central port for this purpose.
- The participating libraries should follow the rules and regulations of the network and be willing to create bibliographic records according to standards laid down.
- Anglo-American Cataloguing Rules (AACR-2) should be used as the code for cataloguing. It will help in creation of standard records.
- Library of Congress Subject Headings (LCSH) should be used as a guide for creating subject descriptors. Other thesauri available on specialized subjects could also be used whenever needed in specialized libraries.
- The network should provide technical assistance to participating libraries in the creation of bibliographic databases.
- A panel of experts should be maintained for providing assistance to libraries.
- A central host machine should be installed for creating a union catalogue, combining catalogues of all participating libraries.
- As libraries in India use mainly Dewey Decimal Classification (DDC), Universal Decimal Classification (UDC) and Classified Catalogue Code (CCC) for classification of books, it would not be

within the means and worth the effort to have one classification scheme in all participating libraries.

- The network should promote inter-library service and sharing of foreign periodicals should be attempted. As far as possible, foreign exchange should be saved on avoidable duplication titles. A courier service should be established to support the sharing of resources.
- All serials should also be published in electronic format and the availability of serials in electronic format, either outline or CD-ROM.
- Most of the abstracting and indexing services have cumulated the entries forming into databases, which can be searched online.
- Networking activities should increase in India. Government should take an interest in this field. Some of the important networks established are NICNET, I-NET, ERNET, SIRNET, INFLIBNET.

Thus, we see that with this network, we can pool together all resources of all libraries, resources of all universities, colleges, research institutions, various departments and also the resources of individuals. It will be possible for us to acquire a greater number of information sources taken together in all the libraries in the country. These can inter-connect people, i.e. students, teachers, researchers, users, etc. It is, therefore, assumed and expected that in order to have quick access by educated or creative member of the society to whatever is happening in their own country or the world over, networks are considered as a boon.

5.4 Impact of Information Technology (IT) in Libraries

Information Technology (IT) the term coined by Jim Domsic of Michigan in November 1981 has been defined by the Information Technology Association of America (ITAA) as "the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer hardware." IT deals with the use of electronic computers and computer software to convert, store, protect process, transmit, and securely retrieve information.

Today, the term information technology has ballooned to encompass many aspects of computing and technology, and the term has become very recognizable. The information technology umbrella can be quite large, covering many fields (<http://en.wikipedia.org/>).

Information technology has simplified clubbing disciplines of the electronic, computer hardware and software, communication (in particular telecommunications), artificial intelligence and human machine interface which are coming together to form new horizons of subjects.

However, UNESCO has defined information technology as, "The Scientific, technological and engineering disciplines and the management techniques used in information handling and current interaction with men and machines and associated social, economic and cultural matters". It acts as one of the major tools to shape our society and our institutions – particularly our libraries as one of the most important influences in education, culture and society. Information technology, through the melding of computer technology with communications, digital imaging and full-motion video and sound, can be a powerful ally to improve education and thus improving skills for gainful employment. Cut, in order to do this, libraries and librarians will have to change. If the right changes are made by libraries of every persuasion, there would be good information technologies. These systems would become major information delivery systems to a wide variety of societal segments.

Information Technology: Its impact on Information and Communication Media

The rapid and exponential growth of information has made it necessary for librarians and information scientists to employ new techniques to cope with the massive proliferation of literature in all subject fields. Research in the science and social sciences has led to high productivity in document publication. To bring this vast amount of information under bibliographic

control and to render it useful and accessible to potential users is a great task. The information is valuable only if it is retrieved timely and cost effective. The scientific application of knowledge has necessitated keeping abreast of the latest information and makes necessary to keep interaction with working in advanced and frontier areas. So, in this age of information explosion/overload, keeping track of information resource and managing the same are the key to achievement and success.

Acquisition, organization, delivery and storage of information have always been the main tasks of any real library. Emerging new technologies offer new ways of handling these tasks. We can summarize the impact of ever renewing information technology on communication media and information in the following manner shown in Table-7.

Table-7: Impact of IT on Information and Communication Media

Work	Technology (Form Old to New)	
Communication	Personal Travel Postal	Teleconferencing, Tele-text, Satellite transmission
Inputting (Primary Format)	Oral Presentation Writing & Typing	Word processing, Optical scanning through computer
Multiplication	Printing	Computer Visual Display, Terminals, Video discs and cassettes, Computerized photo printing
Storage	Book shelves & Pamphlet Microform storage devices	Computer based digital and analogue storage
Information	Browsing through surrogates in catalogue and through shelves	Browsing through on-line, terminals , Database software

Information Technology Environment

Computers have made possible the availability of information and have brought many benefits in library and information systems and services. The computers' application to the information storage, retrieval and

dissemination are the inevitable consequences of the information explosion/overload. The application of computers to information storage and retrieval has brought new possibilities of automatic indexing and free text searching for the words or phrases on the subject, who is likely to occur in any document, and the computer is set to read entire document for the appropriate words or phrases. The development of digital representation of information has made the computer an effective tool for data processing. The qualitative changes in design and architecture of computers and their software have enlarged the sphere of computer applications in library and information centers. The computers are of great significance with the advancement of telecommunication and reprography technologies in the library automation. When computers interconnected by some of the modern communicable vehicles, i.e. through networking one can have information over vast distances in no times.

Applications of IT

Information Technology provides an excellent opportunity for library professionals to manage themselves better. Application of communication technology and electronic data processing of information have made a great impact on libraries and information centers, and the computers and associated facilities have come to be recognized as indispensable for accurate storage, processing, retrieval and dissemination of information. All librarians should be perfectly familiar with the benefits of modern technology and perform efficiently. The main features of the recent development in Information Technology can be briefed as follows,

- ☞ Increased reliability of hardware and software
- ☞ Cheaper data storage, e.g. optical storage media
- ☞ Increased software knowledge leads to speedier and cheaper computer processing
- ☞ Wide use of communication (particularly telecommunication) techniques

These have led to the development of,

- ◆ Local, national and international online systems
- ◆ Automated library systems
- ◆ Public Access Catalogue
- ◆ Electronic journals and electronic knowledge banks
- ◆ Computerized databases and floppies/diskettes, magnetic tapes, CD-ROMs, DVD, etc. for storage.

There has been a very considerable increase in the amount of information available in the form of full-text documents, bibliographical references, factual and numerical data and at the same time increase in the complexity of information handling and storage system.

Computerized Databases/Library Software

In this modern scientific world, manual handling of information has become difficult and complicated. This old system is not accurate and speeding to channelize the information. In order to meet these problems, computerized databases like CDS/ISIS and other advanced useful library packages have already been set up in advanced countries like USA, UK, Germany, Japan and other developed countries. In developing countries, cheaper databases like CDS/ISIS and others are going to be used, in few cases these are widely used but in majority cases, they are still unfamiliar with the utilities of this library software.

In India, along with the use of CDS/ISIS, many purposeful packages like Sanjay, Libsis, Granthalaya, Basisplus, Techlibplus, Libris, Librarian-4 and other relevant packages have come into existence. These innovative software packages are helping the modern librarians in processing and distributing the information and extending the scope of sophisticated kinds of information technology.

Many hardware industries like Wipro and Penguin India Ltd. have come forward in manufacturing library-relevant packages which give users

almost instant access to a large portion of scientific and technological knowledge by means of On-line communication technology.

Computerized Services

Since information literature grows at exponential rate causing problem of space for storage and speedy utilization of vast amount of information, the librarians may take advantages of the computer while searching and retrieving the required information useful to users. The computers are being increasingly used in library and information services for information processing and repackaging of information and on improving products and services of Library and Information Centers. In modern days, many librarians prefer to adopt computers in the libraries because of their following advantages,

- ⇒ Low-cost
- ⇒ Fast and constant response
- ⇒ Availability and portability
- ⇒ Software
- ⇒ Freedom from establishment

Recently, there has developed an awareness of the importance of computers and librarians have started using non-book materials for information transfer. Librarians can utilize computers in their various house keeping activities and information services as mentioned below:

(i) Computerized Services – Technical section

The technical processing desires occupies significant role in the channel of library administration. Computerization of these services would facilitate the library staff as well as information seekers while searching the relevant information.

(ii) Computerized Services – Circulation Section

Computerized information facilitates the librarians to deal with day-to-day operations, planning and decision making. This is an informative package useful to the library managers and other subordinate staff for carrying out their regular work and routine processing of the transactions. For example, facts such as book orders, bills and other matters must be available to them to carry out daily works efficiently. If this information is made available speedily, library staff can do routine duties perfectly and promptly.

(iii) Computerized Services Periodical Section

The acquisition and processing of periodicals are common functions in academic, special and public libraries. In order to maintain and process the details, a library has to maintain large volumes of various registers. The maintenance of register is tedious and every year a large set of data has to be added. Accession registers occupy much space and they are expensive. Manual cataloguing also may not be at uniform standard. It is time consuming and difficult to maintain the large set of data also. Manual calculations are likely to have errors and it is difficult to check all types of errors. To a librarian the modern technology would have a great boon.

▣ Networking and Network based Services

In this information age, with enormous growth of publication and emergence subject specialization and economic pressures on libraries, it has become essential for the libraries and information centers to think of sharing the information resources among libraries and optimizing the use of existing resources through the use of computer and telecommunication technology by establishing various networking systems.

Through library networking, users can scan and monitor the information they require, which a particular library doesn't hold but other library holds

that particular information, without loss of time and at a minimum cost.

Resource sharing networks offer,

- ❶ Document delivery and interlibrary loan services
- ❷ Shared cataloguing
- ❸ Cooperative collection development
- ❹ Coordinated acquisition
- ❺ Reference assistance
- ❻ Consultation and staff training
- ❼ Email, facsimile service, bulletin boards etc.

Access through any network in the globe can be obtained virtually through INTERNET which is widely used international network.

Automated libraries can also help sharing of information through CD-ROM networking. With the increasing trend in electronic publications particularly on CD-ROMs and networks; automated libraries are going to be converted into electronic libraries. The introduction of multi-user and multi task CD-ROM systems has made more economic for most of the organizations, especially where the same data or database are required for several users.

It is relevant to monitor that a number of Indian libraries have a status of rich document collection. Through automation and networking, these rich resources can be put to best possible use not only in their respective states but even outside whenever there would be demand for the information.

5.4.1 Areas of Library Automation

As stated earlier, libraries should adopt the new sophisticated information technology tools to provide accurate and instant information and to cope up with the demands of new knowledge, the enormous increase in the collection of documents, their problems of storage, dissemination and retrieval of information. Today, the term 'Library Automation' is used to

refer "the extensive use of mechanical, electronic or micro-electronic equipments to perform the functions and activities associated with the libraries, such as acquisition, serial control, cataloguing and circulation and also to library and information services and networking". Computers are used in libraries to assist in a number of library routines necessary for efficient day-to-day functioning what we call 'house keeping activities'. They are also used for formatting and generation of indexes.

The computers are of great significance with the advancement of telecommunication and reprography technologies in the library automation – when computers interconnected by some of the modern communication vehicles, one can have information over vast distances in no time. The computers are being increasingly used in library and information services for information processing and repackaging of information and on improving products and services of library and information centers. They offer a versatile tool for organization and retrieval of information.

House Keeping Operations

Modern libraries are complex systems that consist of many procedures and functions. Traditionally, these functions (subsystems) have included acquisition of materials, cataloging and classification, circulation and interlibrary loan, serials management, and reference services.

An attempt is made in this chapter to delineate the functions, features, services and management aspects carried out in integrated library software. The automated operations considered in this study, viz., acquisition, catalogue, circulation, serials control, OPAC, Services and Administration. Each process involves a number of automated functions which are briefly described. These explanations convey the significance and meaning of the functions involved in each of these operations. These explanations hold good for the remaining part of the thesis. Most libraries

have some of these items on their systems and may be other additional features, along with a variety of specifically local requirements.

Acquisition Module

The Acquisition module enables library staff to handle the following major functions related to acquisition of library material.

- Suggestions management.
- Ordering, cancellation and reminders.
- Receiving and Accessioning.
- Invoice Processing and Payment, including fund control.
- Master file management such as currency, budget, vendors, publishers etc.

Through this module library staff can search the entire database of library holdings for the purpose of duplicate checking etc. Using various combinations, number of reports could be generated.

Library's acquisitions department is responsible for purchasing books and other documents including serials for the library's collections. All steps involved in manual acquisition process are automated. Besides this, other services are also offered and reports are generated out of the date entered once. It begins with the arrival of a request to purchase (indent) from a member (indenter) or request for purchase from a vendor (documents on approval), and finally purchase and merger of the records with catalog module and later records can be browsed from the OPAC.

Normally there are number of master files, which are used in automated acquisition system. These file contain the data about vendor, donor, department, members, budget, remarks, currency, subject and letters.

Acquisitions are mainly repetitive work because it is not unusual to find the same information being repeated at various stages right from selection to

the procurement processes. An acquisition involves a great deal of record keeping as well as facing usual difficulties of tracking orders and determining when claims should be produced. Manual acquisitions systems are labour- and paper-intensive, and usually produce only a limited amount of management information. Automated acquisitions reduce the amount of paper handling and generate a wide variety of reports which help in taking appropriate decisions at various stages of acquisition operation.

Acquisitions' encompasses all aspects of the procurement of all types of library materials, whether by purchase, gift or exchange, from the request stage through transfer of materials to cataloguing. Fiscal processes are also included within the scope of acquisitions.

However, this study will follow common library practice in using the term 'acquisitions' to collectively denote those tasks which support the procurement of library materials which are published on a nonrecurring basis, including books, technical reports, government publications, and a/v materials. The procurement may be either through purchase or through gifts.

The major objectives of automated acquisitions systems may be summarized as follows:

- ➔ To reduce labour- and paper-intensive work involved in manual acquisitions
- ➔ To maintain up-to-date information/record of all activities involved in acquisitions
- ➔ To have effective and efficient control over ordering, claiming and cancellation functions
- ➔ To provide accurate and timely financial information
- ➔ To provide necessary management information reports, whenever they are required.

While difference in purchasing practices and procurement regularities may lead to local variations in acquisitions systems, certain basic characteristics and work steps are always similar in all the systems. Thus, this study concentrates more on this commonality found in automated systems. The following sections describe briefly about these various automated functions which are considered in this study:

Detailed Annual Budget

It contains budget details of the department and institute for whom the library is procuring materials. Year, Department/Organization, Budget head, allocation are inputted and saved. It may be repetitive for as many as many department and as many budget heads. Allotted money for purchasing of books and other materials to the library has a fund structure of at least more than one level of hierarchy that is updated dynamically.

Automated systems are particularly valuable in fund accounting and audit trial. A good system maintains correct and current financial records and a good audit trial. Obviously, this function must be sufficiently flexible to operate with the library's policies and changing fiscal management requirements.

One of the main features in this function is that the system should allow maintaining funds under different budget heads as required by the library from time to time. The maintenance will encompass creation, modification, and closing of funds by specifically authorized staff.

The appropriate fund should be encumbered immediately, as soon as the material is ordered. Once items are received and invoices are approved for payment, the funds must be disencumbered and correct expenditure is recorded. This needs to be automatically done once the price and other amounts (such as discount, postage, foreign exchange etc) are recorded into the system and the payment signal is indicated to the system.

Selection Process

The library acquisitions process begins with the selection of materials by the acquisitions staff or with the arrival of a request from the patrons. The library's catalogue and on-order files are first consulted to determine whether the item is on order or already in its collection. Once all the details inputted to the system, the list will be made available for a book selection committee for approval.

Approval Process

After the list is printed, received and verified it is placed before the competent authority for approval. The committee scans the list/request in right perspective against availability of budget and accord the approval/recommendation for purchase. Some requests they may keep in pending due to paucity of funds. The library committee will approve the items which are selected for the library. The library committee will select the items.

Order Process

After the assignment of vendor, supply orders are generated. A single supply order is prepared for all the documents being order to vendor. The supply order is generated for a list of books approved and for a given vendor. The system supply order number retrieves the records of documents ordered in it.

The system will also provides a variety of order statuses, including, but not limited to: in pre-order process, on order, claimed, received but not paid, partially received, currently received, completed, cancelled allows one purchase order number for each title

A thorough checking is normally done to avoid unwanted duplication. If the acquisitions system contains bibliographic data file of library holdings, it is

searched to determine whether a given material is already owned. Otherwise, the on-line catalogue is consulted.

Further, on-order/in-process file will have to be checked to see whether the item is already on order. If a record is already there either in on-line catalogue or in on-order file, assuming that an additional copy will be purchased, the system should support for creating a new order record just by copying automatically the relevant field. By this, the operator's efforts and time to create an order record are minimized. Then, the system should extract necessary details from the operator to reflect the specific requirements of the new order.

However, for a completely new order, all the details are to be filled-in afresh. While specific details will necessarily vary from one system to another, each order record typically consists of some combination of the following fields: an order control number; an order date; a purchase order number; a requester name or code; a vendor name or code; an indication of the acquisition type, price, a fund name or code to which the item is to be charged; and a status code or other information required for the tracking of an item at various stages of acquisitions process.

A good acquisitions system supports various order types such as standing order, on approval, prepaid order, gifts and exchanges and so on. Depending upon the type of order, the system should accept the relevant details from the operator. An efficient system handles ordering of multiple copies and multiple volume documents by accepting minimum possible information and allowing for copying the repetitive data from record to record.

Once an order record has been generated, the system must be capable of transforming the input data into actual orders to be sent to the vendor or other sources. In India, as the transmission of order via magnetic media or

telecommunication lines is not yet in practice, the orders have to be printed by the system as per the specifications of the individual library.

Standing Order

An order placed by a library with a publisher or vendor to supply each volume or part of a specific title or type of publication as published, until further notice. Unlike subscriptions, which must be paid in advance, standing orders are billed as each volume is shipped. This option may be integrated to place standing order which is procured by the library as when there are published.

Receiving Process

Once the documents have been received with invoice, these are taken on charge and bills are forwarded for payment. A supply order may be for multiple documents and there may be multiple receipts against a supply order. In case any advance payment was made with standing order, the same may also be entered and adjusted against final payment.

Basically the received item processing in an automated system involves updating of order record to indicate the receipt of the item. When an item is received, the system's operator retrieves the appropriate order record to verify the correctness and completeness of the order. Depending on the situation, the operator has to take further actions.

The system should enable the operator to record variety of received statuses to indicate the precise disposition of the items. For example, if an item is received damaged or defective, this fact needs to be recorded in the order record.

The system should efficiently handle the partial receipt of an order, receipt of the item without invoice, receipt of the items through different order types, items received but not ordered, etc. The system should enable

verification of the correctness of bibliographic details of the items supplied and in case deficiencies are noticed, take appropriate measures. Further, in case, the bibliographic or other details are incomplete or incorrect, the system should allow for updating them at this stage.

Invoice Process

When a vendor's invoice is received, it must be reviewed to determine that the item actually was received and that the amount billed corresponds to the amount encumbered. After the invoice is verified it is normally sent along with an accompanying voucher to an accounts office in order to prepare cheque for payment of the material.

If an item is received before its invoice, the receipt of the item is recorded into the system. Further, the non-receipt of the invoice is also recorded in the system so that the system can generate claims for the invoice. Similarly, if the invoice is received before its item, the receipts of the invoice and along with other details are entered into the system with an indication of the non-receipt of the item. In this case the system generates claims for the item. Further, the fund file has to be suitably updated automatically.

If the item and invoices are received together, after verifying their correctness the receipt of the both are recorded. Suitable updating in order file, invoice file and fund file may be made at this stage.

Payment Process

The purpose of this function is to assist the library staff in performing the work related to payment of invoices for library materials acquired via the different types of purchase schemes. The assistance includes maintenance of record of all invoices approved for payment, maintenance of records of payment, maintenance of cheque register, voucher register

etc. The most important thing is the maintenance of complete audit trail for all transactions done in this function.

Reminders to Vendor Process

A claim is an area where an automated system has been found very helpful. If an order is not received within the specified period, a claims notice/reminder has to be generated and sent to the vendor unless notification of delay has been received and noted in the system. A system should provide for both automatic claiming of ordered materials and operator initiated claims. In the former case the system triggers claims notice production automatically and in the latter case the claims are reviewed and released by the staff for printing. A good system arranges the items to be claimed in vendor order and print all claims to a vendor on a single claim notice unless the library requires that they be printed on separate forms.

The claiming function should also incorporate the claiming of invoices and bindery orders. The system should have the capability to produce follow-up (subsequent) claims if no response is recorded by the system within a specified period. Although the acquisitions systems may support the issuance of any number of claims, generally, a maximum limit is fixed by the library as the probability of receiving the item after that limit is very low.

Accessioning Process

Accessioning process involves assigning Accessions Numbers to the items received. Some systems automatically generate the range of Accession Numbers and in some systems Assignments has to be assigned by the operator. To record in an accession list the addition of a bibliographic item to a library collection, whether acquired by purchase or exchange or as a gift. The process of making additions to a collection is known as accessions. Accession register is a record book with records for all accessions and their accession numbers.

Routing and Bindery Preparation

Routing function intends to send materials to faculty, staff, researcher, or other specified categories of clientele for review prior to shelving. The existence of this function eliminates one more source of exception processing and its attendant manual efforts. Routing information need to be suitably maintained by the system. But it has to be always linked with the order record. On demand, routing of selected items should also be supported.

Bindery predations means preparing list of documents needs to be sent for binding. System should support by marking those documents and showing them in OPAC.

All of this means that the data contained in the acquisitions system must be specific enough to enable the system to determine what is to be done for each item received.

Print of Accession Register

Accession register is a record of for accessions and their accession numbers. A list of the bibliographic items added to a library collection in the order of their addition. Normally such a list includes the accession number, brief bibliographic identification, source, and price paid for each item. Once the document is received, all other bibliographic details will be inputted. Later the accession register will be printed.

Print of Invoice Register

Invoice register is a record book with records for all invoices and their invoice numbers. A log or report of accounts payable invoices created for a specific, vendor, batch, date range or other parameter.

Print of Spine Label

A small typed or printed label affixed to the lower spine of a book or other bibliographic item at the time it is processed, displaying its location symbol and call number, for use in reshelving and to assist the user in retrieving the item from the shelf once the call number has been found in the library catalog. Once the document is received, all other bibliographic details will be inputted. Later the spine labels can be generated based on the call numbers to paste it on the spines of the documents.

Data conversion in Standard Format (ISO 2709)

MARC 21 or CCF defines a standard for the mark up of bibliographic data. ISO 2709 defines how the marked up record is formatted so that it can be read by computer programs and can be transferred among computers. ISO 2709 is usually referred to as the MARC or CCF communications format. Bibliographic records can be imported /exported through the software as part of retrospective conversion process. MARC records can directly upload to the Acquisition section for processing.

Communication through Email to the Vendors

This is the exchange of information through written or electronic mail to the vendors for any acquisition related matter like order placed or reminders can be sent, etc.

Serials Control Module

The complex job of keeping track of serials can easily and effectively be handled using Serial Control module. This module broadly handles following functions.

- Suggestions.
- Subscription (renewal and new subscription).
- Payment including fund control etc.

- Check in of issues including prediction of issues arrival.
- Reminder generation.
- Binding management.
- Master database management.
- Search status of every item.
- Reports generation etc.

Serials management, an integral part of library operations, has become increasingly complex over the years. The emergence of electronic journals has made Serials Control as further complication. Serials management always has been an area that is labour intensive, demanding high degree attention to accuracy and detail. The benefits of the application of automation in other areas of library operations is now well established; it is a natural progression for librarians and system designers now to seek to apply the power of computer to control one of librarianship's most troublesome processes.

As used in this study, the term 'Serials' denote those publications which are issued in successive parts on a recurring basis, usually, but not necessarily, at regularly scheduled intervals and usually having numerical or chronological designation. The term 'Serials control' refers to those tasks which support the procurement and management of serials collection in a library.

There may be a number of master files, which are used in automated serials system, some files like members, vendors, budget, and department, are common which are used in circulation, acquisition and cataloguing systems. These files contain the data about journal, vendor, and publisher, department, binding specifications, currency, subject and letters.

The major objectives of automated serials control system may be summarized as follows:

- To have effective & efficient control over subscriptions, claiming and cancellations activities
- To record and maintain accurately and timely the serials holdings data
- To have a good control over binding & related activities
- To provide accurate and timely financial information
- To provide necessary management information reports, whenever they are required
- To reduce labour- and time-consuming work involved in manual serials control systems

The following sections describe briefly the various functional requirements of an automated serials control system:

Detailed Annual Budget

It contains budget details of the department and institute for whom the library is procuring materials. Year, Department/Organization, Budget head, allocation are inputted and saved. It may be repetitive for as many as many department and as many budget heads.

Automated systems are particularly valuable in fund accounting and audit trial. A good system maintains correct and current financial records and a good audit trial. Obviously, this function must be sufficiently flexible to operate with the library's policies and changing fiscal management requirements.

One of the main features in this function is that the system should allow maintaining funds under different budget heads as required by the library from time to time. The maintenance will encompass creation, modification, and closing of funds by specifically authorized staff.

Other features related to accounting function include alerting depletion of accounts, calculation of foreign currencies and handling of exception

situations. Maintenance of a full audit trail particularly for financial transaction is essential. The audit trail details should be recorded in such a way that they should identify the person effecting the transaction, as well as the date, time, nature of transaction carried out etc.

Automated systems are particularly valuable in fund accounting and audit trail. Obviously, this function must be sufficiently flexible so as to operate with the library policies and changing fiscal management requirements.

Other main feature in this function is that the system should allow maintaining funds under different budget heads as required by the library from time to time. The maintenance of funds encompasses creation of funds, closing of funds or modification of funds by suitably authorized persons.

On payment for the new subscription and renewal of subscriptions, the system should adjust the funds appropriately. The system should record the actual price paid, postage, foreign exchange, etc, as appropriate to each serial.

Maintenance of a full audit trail particularly for financial transaction is essential. The audit trail details should be recorded in such a way that they should identify the person effecting the transaction, the date, the time, nature of transaction carried out, etc.

Selection Process

The library Serials acquisitions process begins with the selection of serials by the acquisitions staff or with the arrival of a request from the patrons. The library's catalogue and on-order files are first consulted to determine whether the item is on order or already in its collection. Once all the details inputted to the system, the list will be made available for a selection committee for approval.

Approval Process

After the list is printed, received and verified it is placed before the competent authority for approval. The committee scans the list/request in right perspective against availability of budget and accord the approval/recommendation for purchase. Some requests they may keep in pending due to paucity of funds. The library committee will approve the items which are selected for the library. The library committee will select the serials.

Subscription Process

An acquisition, in serial control system, refers primarily to the tasks involved in making new subscriptions, re-subscription, renewal and cancellation of subscription. In order to handle the acquisitions work efficiently, the system should maintain in-process file and a vendor file. The in-process file may contain the bibliographic and order data, as well as invoice data if required. The system should be able to produce automatic subscription renewal alert. Acquisitions through gifts & exchanges should also be supported by the system. The system should provide support of production of orders, claims, cancellation notice and other communications required in this function.

Receiving of Titles Process

Once the documents have been received with invoice, these are taken on charge and bills are forwarded for payment. A supply order may be for multiple documents and there may be multiple receipts against a supply order. In case any advance payment was made with standing order, the same may also be entered and adjusted against final payment.

Basically the received item processing in an automated system involves updating of order record to indicate the receipt of the item. When an item is received, the system's operator retrieves the appropriate order record to

verify the correctness and completeness of the order. Depending on the situation, the operator has to take further action(s).

The system should efficiently handle the partial receipt of an order, receipt of the item without invoice, receipt of the items through different order types, items received but not ordered, etc. The system should enable verification of the correctness of bibliographic details of the items supplied and in case deficiencies are noticed, take appropriate measures. Further, in case, the bibliographic or other details are incomplete or incorrect, the system should allow for updating them at this stage.

New Order Process

The committee may approve some new serials to be added from the current subscription year. The details of such journals are added in the order and purchase order is generated. The journal database is updated and check-in record is then added to the bibliographic record and check in boxes is added in the Kardex record with the appropriate parameters.

Acquisitions, in serial control system, refer primarily to the tasks involved in making new subscriptions, re-subscription, renewal and cancellation of subscription. In order to handle the acquisitions work efficiently, the system should maintain in-process file and a vendor file. The in-process file may contain the bibliographic and order data, as well as invoice data if required. The system should be able to produce automatic subscription renewal alert. Acquisitions through gifts & exchanges should also be supported by the system. The system should provide support of production of orders, claims, cancellation notice and other communications required in this function.

Renewal Process (Continuation of Titles)

The libraries adopt different procedures for renewal of subscription for next period. Most of the libraries start the serials subscription process at

least 2 to 3 months in advance. If a library's practice is to renew the subscription for the serials one month prior to the subscription date, renewal period is taken to be 30 days. So one month prior to the expiry of current subscription status of all serials.

Membership and Receipts against Membership

The libraries adopt different procedures for subscription to serials. One way library/institution can become a member of a publisher/organization or a body. So the system should supports the basic functions associated with membership and receipts against membership.

Standing Order

An order placed by a library with a publisher or vendor to supply each volume or part of a specific title or type of publication as published, until further notice. Unlike subscriptions, which must be paid in advance, standing orders are billed as each volume is shipped. An order to supply each succeeding issue of a serial, periodical or annual publication, or subsequent volumes of a work published in a number of volumes issued intermittently.

This option may be integrated to place standing order which is procured by the library as when there are published. Standing order serials are received directly at library with invoices enclosed, in most cases, with each shipment.

Invoice Process

When a vendor's invoice is received, it must be reviewed to determine that the item actually was received and that the amount billed corresponds to the amount encumbered. After the invoice is verified it is normally sent along with a n accompanying voucher to a accounts office in order to prepare cheque for payment of the material. If the item and invoices are

received together, after verifying their correctness the receipts of the both are recorded. Suitable updating in order file, invoice file and fund file may be made at this stage.

Payment Process

The purpose of this function is to assist the library staff in performing the work related to payment of invoices for serials subscribed via the different types of purchase schemes. The assistance includes maintenance of record of all invoices approved for payment, maintenance of records of payment, maintenance of cheque register, voucher register etc. Though very rarely seen in practice, the system may be made to write the cheques also.

Check-in Process for Title

One of the most important features of a serials control system is its check-in capability. Because it is a highly repetitive operation, it must be fast and "friendly" to be useful to the library. The ongoing process of recording of the receipt of each issue of a serial is a routine task accomplished by the serials department of a library. Automated systems allow the patron to view the check-in record for a given title.

If the checked-in issue is not the one expected but is a later one, the system should automatically mark the gap. On the other hand, if the checked-in issue is not the expected one but an earlier one, the system should be able to find out whether the issue details correspond to a missing (gap) or whether it is a duplicate issue. In either case, the system should be able to update suitable file/records with minimum operator intervention.

A good system supports the check-in of multiple copies of an issue on a single check-in transaction even when these copies are accommodated in separate copy records. In the interest of efficiency, the system should also support check-in of special issues, combined issues, supplements, "come

with" issues and so on. It is helpful, if the system provides a link to the full bibliographic record to resolve some problems like variations in title or other bibliographic data elements.

The predictive check in system generates a box for each issue, supplement or index that the library expects to receive. The system computer data can include volume and issue number, cover date, and expected arrival date. For issues that have already been received by the library, the data consist of the arrival date; the number of copies received, notes, etc. In addition, check in records (both active and inactive) contain summary holdings statements, binding parameters, and other data, including library-defined, variable-length fields.

Reminder to Publishers/Suppliers

A claim is an area where an automated system has been found very helpful. If an order is not received within the specified period, a claims notice/reminder has to be generated and sent to the vendor unless notification of delay has been received and noted in the system. A system should provide for both automatic claiming of ordered materials and operator initiated (forced) claims. In the former case the system triggers claims notice production automatically and in the latter case the claims are reviewed and released by the staff for printing. A good system arranges the items to be claimed in vendor order and print all claims to a vendor on a single claim notice unless the library requires that they be printed on separate forms.

The claiming function should also incorporate the claiming of invoices and bindery orders. The system should have the capability to produce follow-up (subsequent) claims if no response is recorded by the system within a specified period. Although the acquisitions systems may support the issuance of any number of claims, generally, a maximum limit is fixed by the library as the probability of receiving the item after that limit is very low.

Claiming Process

The most frequently faced problem in serials management is the non-receipt of the journal issues in time. The system should automatically identify the issues that should be claimed. Some claims may be automatic and may cause the system to trigger claim notice production without or with minimum staff intervention. Other claims will be semi-automatic in the sense that they require staff review prior to claim notice production. Certain situations demand for forced claim ie., claiming for an issue through operator initiation. The system should have all facility to handle all these three situations.

For items that do not have predictable pattern of frequency or enumeration, claims have to be sent for those items for which there has been no check-in activity within a library-specified period. To be really useful, the system should generate follow-up claims. The criteria for generating such claims may be one suitable to the individual library's practice. Although the system may support issuance of any number of claims, generally a maximum limit is fixed since the probability of receiving the receiving the issue after that limit is low.

Tracking Vendor Licenses and Licensing Agreements

Almost all of the e-journals and databases that the library makes available through its web site have restrictions on use and access that are specified in the licensing agreements signed by the library and the respective publishers and vendors. Licenses vary from resource to resource but, in general, Access to some resources may be limited to on-campus use only etc. The system should have a facility to manage these use patterns.

The libraries adopt different procedures for renewal licenses of subscription for next period. If a library's practice is to renew the subscription for the serials one month prior to the subscription date,

renewal period is taken to be 30 days. So one month prior to the expiry of current subscription status of all serials.

Print of Accession Register

Accession register is a record book with records for all accessions and their accession numbers. A list of the bibliographic items added to a library collection in the order of their addition. It includes the accession number, brief bibliographic identification, source, and price paid for each item. The purpose of this function is to print accession register on demand.

Print of Invoice Register

Invoice register is a record book with records for all invoices and their invoice numbers. A log or report of accounts payable invoices created for a specific, vendor, batch, date range or other parameter. The purpose of this function is to print invoice register on demand.

Bindery – Preparation of Sets

This function is particularly important in Serials control system. It is a common practice in libraries to bind the completed volumes for archival storage. An automated system should be able to indicate when an item is ready to be sent for binding.

At any point of time, the system should be able to provide on demand the lists of serials that need to be sent for binding. Binding orders should be prepared by the system upon the instruction from authorized staff. The binding orders may contain relevant details like type of binding (material, colour, method etc), information to be recorded on bound material, type of lettering (type face, colour etc), and the mode of inclusion of index/content pages and so on.

A good system provides the staff the capability of deferring bindery orders when circumstances dictate, and to indicate to the system a time in future

when the binding order should be produced for review. The provision of facilities like cancellation of orders, production of claims notice for non-receipt of bound issues as well as non-receipt of invoices etc will add to the efficiency of the system.

Upon the receipt of the bound volumes, the system should allow to record the receipt and other details suitably.

Bindery – Order Process

The purpose of this function is to assist the library staff in performing the work related to order process. The serials are prepared as set based on the requirement and may be sent for the Binding process. This function will be used if there is no in-house binding section in the library.

Bindery - Invoice Process

The purpose of this function is to assist the library staff in performing the work related to payment of invoices for the library materials received from the Binder.

Bindery – Payment

Upon the receipt of the bound volumes, the system should allow to record the receipt and other details suitably. The purpose of this function is to assist the library staff in performing the work related to payment of invoices for Bounded serials.

Title History – Change, Split, Merge, etc.

Peculiarity in the serials is the title may change, split, and merge etc. due to various reasons. The system should allow performing this options depending upon the requirement. System should able to produce the reports for specific kind of titles.

Title Holdings Details

The total stock of materials, print and non-print, owned by a library or library system, usually listed in its catalogue of all the copies, volumes, issues, or parts of an item owned by a library, especially a serial publication, indicated in a holdings statement in the record representing the item in the catalogue. One of the advantages of automated systems is the relative ease with which reports can be generated.

Communication through Email to the Vendors

This function will help libraries to exchange of information through written or electronic mail to the vendors for any acquisition related matter like order placed or reminders can be sent. One of the advantages of automated systems is the relative ease with which reports can be generated and can be directly to sent to the vendors by e-mail.

Article Indexing

Once the serial is registered in the system, a professional will scan the serial and select the articles which are important and the thrust are of the institutes. Bibliographic information of an article is inputted in to the database. Search feature will enable users to search these articles indexes. Good systems have this facility and article indexing feature is getting importance because of the emergence of electronic resources and internet.

Catalog Module

This module is used for retrospective conversion of books; technical processing of books received from Acquisition Section, printing a range of records for verification, searching by title and accession numbers, authority files for publishers etc. This module broadly handles following functions.

- Data Entry
- Retro conversion
- Export/Import of records
- Catalogue card generation
- Authority file maintenance
- Report Generation
- Catalogue Search
- User Services
- Stock verification

The following sections describe briefly about these various automated functions which are considered in this study:

Bibliographic Standards – CCF and MARC 21

In the online catalog, the description of a specific item, designed to differentiate between copies or versions of the same items. The descriptions consist of the title and statement of responsibility (author, editor, etc.), edition, type of publication, publisher information, physical description, series, notes, etc.

Bibliographic database is a database of resources available at libraries in print format. With the revolution of information technology in the field of libraries, bibliographic catalogue has come up into the form of bibliographic database. Some of the internationally recognized standards and formats being used by many libraries of different countries for creating databases.

CCF: An international standard digital format for the description of bibliographic items developed by the UNESCO. It facilitates the creation and exchange of data using ISO 2709 format.

MARC 21: An international standard digital format for the description of bibliographic items developed by the Library of Congress. It facilitates the

creation and dissemination of computerized cataloging from library to library within the same country and between countries. The MARC 21 family of standards now includes formats for authority records, holdings records, classification schedules, and community information, in addition to formats for the bibliographic record.

Catalogue Code - AACR 2 and CCC

Anglo-American Cataloguing Rules (AACR) and Classified Catalogue Code (CCC) are detailed set of standardized rules for cataloging various types of library materials. Many libraries are following AACR 2 and CCC for rendering the bibliographic information of the documents in the library.

Use of common standard for cataloguing will made it possible for libraries to pool their efforts through the use of derived cataloguing and shared cataloguing projects. Of equal importance, the adoption of AACR has provided consistency and clarity for library users who use those catalogue records to access the diverse collections of libraries.

Multilingual Facility

Application can simultaneously display and manipulate text in multiple languages. Language barriers present a major problem in the effectiveness of resource sharing and in common access to the resources of libraries. Now Unicode is playing a major role in resolving this problem. The system should have the support for multilingual facility.

Authority Files - LCSH Names, LCSH Subjects, Series and Sears List

Authority Control means that names, subjects, and series entries in database are validated against a set of national databases to ensure consistency in the way that those terms have been assigned. Several different authority files can be used for validation. The Library of Congress Name Authority File and the Library of Congress Subject Headings are the

most common. Also many libraries are using Sears List of Subject Headings, etc.

Different subject headings list are available, developed by different institutions such as LCSH, Sear's List of Subject Headings, MeSH, Thesaurus etc.

Classification Schemes

There are different classification schemes have been developed by various organizations for classifying the books on different subjects. Dewey Decimal Classification (DDC), Library of Congress Classification (LC), Universal Decimal Classification (UDC) and Colon Classification (CC) systems are the most frequently used call number classification systems worldwide.

Printing Facility

In an automated cataloging system, the data can be searched and various kinds of reports can be generated. The following are the few examples of outputs generated by the systems;

Catalogue Card

Catalogue cards can be printed using Print of Catalog card function. Facility could be either print of single card or range of series by Accession Number or Record Number.

Added Subject Headings

Added Subject Headings can also be printed in similar way like print of Catalog cards.

Shelf List

The Print of Shelf list Labels feature allows printing the shelf list cards.

Spine Labels

The Print of Spine Labels feature allows to print the Spine Labels to paste on the items.

Bar Code Labels

Barcode Labels can also be feature allows to quickly copy or print an item's basic cite and call number.

Barcode

A printed label containing machine-readable data encoded in vertical lines of equal length but variable thickness, which can be read into an attached computer by an optical scanner. In libraries barcodes are used to identify books and other materials for circulation and inventory and to link the borrower's library card to the appropriate patron record in automated circulation systems. Several different technologies exist for reading barcodes. The most common and most accurate is a laser scanner that mounts about 12 inches above a surface. Its beams face downward and follow a number of different paths. Barcodes can be scanned even when presented at odd angles.

A new and innovative replacement for barcode technology is RFID (Radio Frequency Identification Devices). RFID is used in retail environments, and is beginning to be installed in libraries. RFID brings many of the same advantages of barcodes, but uses a different type of reader to collect data. When this technology is used in libraries it allows books to be checked out and returned without the need to physically handle every item. In addition, it makes library inventory projects much more efficient.

Data Conversion - ISO 2709 for Data Exchange

This standard specifies the requirements for generalized interchange format that will accommodate data describing all forms of material. It

describes a generalized structure designed specifically for exchange of data between processing systems and not necessarily for use as a processing format within systems. The format may be used for the interchange of records using various communication media.

Library systems vendors have software that enables them to extract data from other sources (spreadsheets, database managers, home-grown programs, text files, etc.) and convert that data to MARC or CCF.

Z39.50 Protocol

Z39.50 is a communications standard which describes the rules and procedures for communicating between two computer systems for searching and retrieving information from databases (Lunau, 2000). It is a “broker architecture” which offers client-based services that interact with external servers through a standard protocol *(Pearce et al., 2000). It enables a remote source to be searched using the interface of the local client, obviating the need to master a variety of search interfaces and facilitating the integration of bibliographic resources.

Metadata to Catalogue Electronic Resources

Metadata describes how and when and by whom a particular set of data was collected, and how the data is formatted. Metadata is essential for understanding information stored in data warehouses and has become increasingly important in XML-based Web applications.

Circulation Module

The circulation control is an important function of library management. It keeps track of members’ registration, issue, renewal, return and reservation of documents. Circulation is a central and highly visible function of a typical library. Circulation, which is often compared with inventory control, involves a great deal of record keeping and

correspondingly, staff time. It is highly essential that the records have to be accurate and all information has to be updated immediately after each transaction. In other words, circulation control is useful if it is in online real-time interactive mode.

Circulation, by definition, encompasses all aspects of patron loan processing and management, including closed reserves, holds, material booking and in-library use of the collection. Automated support for circulation control vastly improve library's ability to rapidly and accurately record the loan transactions, to monitor these transactions, to record return of lent items and to support other related circulation functions.

The objectives of an automated circulation control may be summarized as follows:

- To create patrons details
- To record timely and accurately the loan transaction data
- To have efficient and effective control over dues, fines and records
- To accurately provide information about status of a book and/or library loan status of a borrower
- To provide necessary statistical and management reports.

The following sections briefly describe the functional requirements of an automated circulation system.

Registration of Users

As and when new member joins the university and intend to use library, it will be given membership after certain formalities are completed and allotted a member code. Library members will be registered by category wise. Types of documents, period of issue, and fine to be charged is case the document is overdue is determined by categories. Some of the software will automatically generate the member code and in some software the system will allow to enter the member code. The database is arranged on member code.

Collection of Library Fee

When a new member joins the university and intends to use a library, membership will be given after paying the requisite library fee. Library members will be registered by category wise and fee will be charged according to the library policy.

Collection of Library Deposit

Library deposit will be collected when new member joins the Library as a member. Library members will be registered by category wise and library deposit will be collected according to the library policy. It has be returned back to the member after the membership term expires. System should have this facility to do this process.

Print of Member Identity Card

The means by which staff at the circulation desk of a library ascertain that a patron is a registered borrower, usually the person's library card, student ID card, or a substitute. As and when new member joins the organisation and intend to use library, the member will get a membership after certain formalities completed and allotted a member code. Library members will be registered by category wise. Some of the software will automatically generate the member code and in some software the system will allow to enter the member code. The member identity card can be printed once the registration is over.

Print of Bar Code for Member ID card

Bar code can be printed on member identity card based on the member code. The barcode can be printed either by library software or through the external software.

Calendar for fine calculation and adjusting loan periods for holidays

Calendar is a holiday list of an institution. This calendar will be helpful during transaction process.

Renewal of Memberships (Continuation)

This function allows for the patron to extend the loan period. This function may be thoroughly controlled by the patron type, material type, the reservation status of the book, and other conditions as applicable to an individual library. As many a times, renewal has to be done with or without the presence of the patron and/or item, the control has to be exercised by the system automatically. In case the item to be renewed has a hold (reservation) or recall outstanding, the renewal should be denied, of course depending on the library policy. Again, depending upon the library policy, successive renewals may be restricted.

Issue and Return of Items (Transaction)

All the transactions, i.e., issue / return, renewal, reservation, cancel reservation, written off, etc. of documents are carried out and stored in different files/databases. The following transactions are performed in automated circulation system.

Issue of Items

Charge/Issue is one of the fundamental functions in a circulation control system. For charging an item, the Member Code and Accession Number are identified to the system (through Barcode scanner or keying in the data or some other means) which are eventually validated by the system for their correctness. Only if both are through with the validation check, the system records the transaction and allows the patron to borrow the item. It also sees whether the total number of items borrowed is within the borrowing privilege of the patron.

In the interest of efficiency, the system should support for having different patron types with different borrowing periods. Further, it should allow different types of items to be loaned for different loan periods as prescribed by the library.

Return of Items

The discharge function basically involves receiving the item back into the library and updating the patron's record to reflect the returning of the item and producing an acknowledgement for returning the item, if required. The system after suitable validation, updates the concerned records suitably.

Overdue

An item is said to be overdue, if it is not returned to the library on or before date established at the time of charge or renewal or recall. The system should detect the overdue items and produce suitable overdue notices to the patron.

Issue/Return of Items using Barcode Scanner

The issue/return function can also be performed by using barcode facility. The barcode label pasted on the book and members' identity card to facilitate fully automated circulation control. Several different technologies exist for reading barcodes. The most common and most accurate is a laser scanner that mounts about 12 inches above a surface. Its beams face downward and follow a number of different paths. Barcodes can be scanned even when presented at odd angles. This will save the time of manual entry.

Renewal of Items

This option is to renew the documents already issued to members. The member can request for renewal of the document by its accession number.

Reservation of items

This function helps the operator to reserve a document which is on loan. It is usual practice in libraries to maintain the holds queue on first-come first-serve basis. Even in this function, before actually recording the holds, the

system has to govern the hold placement by material type, patron type and other conditions as required by the library policy. Upon the issue of item, the system should produce a notice to be sent to the patron at the head of the queue. If the patron does not claim the item within a specified time, the system should automatically send the notice to the next patron in the queue.

Reminders to the users (Recall of a Document)

It is not an unusual situation in libraries to recall the items borrowed by a patron. Even in this function, the system may allow recall to be governed by patron type and material type. Though, normally, an item is recalled if it is overdue and/or is reserved by some patron, there may be other conditions for recall such as item is required for some purpose in the library, the item has to be sent for binding and so on.

Issue of No-due Certificate

When a member leaves the institution, library requires to issue a no-dues certificate showing clearance from the library. The certificate contains the member name, member code, and date of issue of certificate details. One may cancel the membership at the time of issuing the certificate.

Reporting of Missing of Items

When a document is missed by a member or in library it has to be reported at circulation desk. The system will generate a note and change the status of a document as missing.

Reporting of Lost Items

When library materials are declared lost by the patron, the system should be able to calculate the replacement cost. If the bibliographic record for the item does not contain the required information for calculating the cost, the system should allow library staff to enter an amount. Similarly, depending upon the policy of a library, the books may be treated as lost when the

system accrue to the account of the patron an amount equal to the replacement value of the item lost (or not returned).

Collection of Overdue Charges

In order to ensure the prompt returning of items, it is usual practice in libraries to levy fines against patron for failure to return items by due date. Usually, the fine accrued will be calculated upon the discharge of an overdue item. While calculating fines, it is necessary for the system to consider (as per the library policy) the type of item, the patron class, and other specifications as applicable to individual library. Further, the system should take into account the holiday list during the calculation of fines. If the library policy allows, the system should allow for partial payment of fines also. An efficient system allows suitably authorized staff for waiving of the fines and levying of fines for document(s) mutilated by the patron.

Maintenance of Replacing Items

The documents which are lost by members will be either replaced by the same title or the money can be collected depending on the institution policy.

Maintenance of Damaged Items

The documents which are damaged, not usable are often written off from the accession register using predefined procedure of that organization. Such documents are withdrawn from the circulation.

Inter Library Loan (ILL) Service for Borrowing

When a book or other item needed by a registered borrower is checked out, unavailable for some other reason, or not owned by the library, a patron may request that it be borrowed from another library. Documents received on ILL from other libraries can be issued only to the members. The transaction is recorded in the transaction file.

Inter Library Loan (ILL) Service for Lending

Documents will be landed to other member libraries. The system will generate a report for these documents and status will be changed as issued.

Maintenance of Withdrawal Items

The documents may be withdrawn from the library in time to time according to the library policy. The software will generate a report for such kind of documents and status will be changed for those documents.

Issue / Return of Loose Issues of Serials

Circulation of loose issues of serials needs to be supported by the serials control systems. All regular functions in a general circulation control systems may be included in this function also.

Issue / Return of Back Volumes of Serials

Circulation of bound volumes of the journals needs to be supported by the serials control systems. All regular functions in a general circulation control systems may be included in this function also.

Sending Notices by Email to the Users

This option may be used to send letters to a member about document issued to him that is/are urgently required by some other member. The letter addressed to the member whom the document is issued contains accession number and title of the document details. The communications can be done through the e-mail facility.

Online Public Access Catalogue (OPAC) Module

The OPAC in its very rudimentary form first emerged in the late-1970s and early-1980s, subsequently going through several generations of development. The basic purpose of library automation software is to help in creating a database of library holdings, which will, in turn, provide an online catalogue to help the users in identifying and locating their required documents.

The present trend in this field is that these systems are also supporting the Web-OPAC facility, by which the library catalogue can be browsed and linked to the electronic resources over the internet by graphical browsers. These interactive web-OPACs allow the users to access various resources of other libraries, publishers, online vendors, etc. connected to the internet.

The following sections describe briefly about these various search features and functions in OPAC module which are considered in this study:

Author Search

A user with the help of the name of the author or a part of the field of an author can search through this module. The Author search makes it possible for to get focused results by searching only the part of the catalogue that includes authors' names. This means that, although one is searching every record in the catalogue, the search terms apply only to a small, specific part of each record. Through the author search option it is possible to search personal name, corporate body, meeting, proceedings, etc. Search option is most powerful feature of most of the automated systems.

Corporate Author Search

This Search option allows the user to search for the required documents authored by corporate bodies, view and print the results.

Title Search (full title)

The feature allows the user to search by the title of a document. This search is used when a user know the title or first part of the title of an item in the collection. Here, the search focuses on obtaining results specifically from the title field in the records of the OPAC, thus narrowing the search results.

Search by Word from the Title

This search returns records that contain the words in the title. Search results are ranked by relevance. Each keyword is searched across the title field in the catalogue record and provides a broader result set.

Search by Keyword Combined with Subject

This search returns records that contain all, some and one of the words in the query. Search results are ranked by relevance. Each keyword is searched across the subject headings field in the catalogue record and provides a broader result set. In general keyword searching, patron can provide any topic of his interest and system will help in finding the relevant items.

Search by Subject

For a subject search, patron need to use the Subject terms or Headings the Librarians assign to each item that is acquired by the Library. The Librarians use a specific list from which to choose these terms, such as LCSH, Sears List, MeSH, etc.

Search by using Boolean Operators

Boolean operators are used to broaden or narrow the search request by using AND, OR, NOT operators and also combining the various search options. For example, one can choose to find a record by combining the author's name together with the title of the book. Similarly, one can combine different subject headings or general keywords to narrow or widen the search.

Search by Accession Number

This search returns records that contain the searched accession number in an item. This search particularly is helpful in knowing the status of an item when a user knows the Accession Number. The system allows the user to determine item-level circulation status information in real-time and note if items have special locations (in transit, reserve, etc.) or statuses (recalled, on hold, etc.).

Search by Call Number

This search returns records that contain the searched call number in an item. Call number is the address of an item indicating its location within the library. The call number is comprised of the class number, the book number and often a date or a volume number or even a copy number. To perform this search patron has to be aware about the class or call number of an item.

Search by the Shelf Mark of a Book

The user has to select 'Shelf mark' as choice for display. This search returns records that contain the search made by Shelf mark of a document. The results screen displays author, title, edition, publication year, etc along with a Shelf mark. The shelf mark link will display where the item is shelved, e.g. Text Books, Reference or main collection. This

search will be usually helpful for special collection such as Music, Video, etc.

User Information

The user can search the OPAC by member identity number and the details usually showed on loans, reservations, charges, etc. Allows the user to see a list of the Items he/she currently has on loan, showing the length of the Loan Period and the Due Date for each. The number of other people who have reserved each Work is also indicated. It may be possible to renew loans, if the Library chooses to enable this functionality. The system allows the user to determine item-level circulation status information in real-time and note if items have special locations (in transit, reserve, etc.) or statuses (recalled, on hold, etc.).

Serial Issues Received/Expected

The system allows the user to see the status of serials issues received etc. The predictive check-in system generates a box for each issue, supplement or index that the library expects to receive. The data can include volume and issue number, cover date, and expected arrival date. The user can access this information through the OPAC.

Status of Title (issued, reserved, withdrawn)

The system allows the user to see records for materials in all status categories such as fully catalogued, provisional records, course reserves, on order, in process, lost, withdrawn etc. The system allows the user to determine item-level circulation status information in real-time and note if items have special locations (in transit, reserve, etc.) or statuses (recalled, on hold, etc.). The user can access this data through the OPAC.

Other Language Interfaces Available on the System

It is used to change the display mode of the language. So the catalogue data of the reference result including multilingual characters can be displayed rightly. The Multilingual search system integrates advanced linguistic technologies in a user friendly interface and bridges the gap between the vernacular languages.

Article Titles in Periodicals

Indexes and Abstracts offer author, title and subject access to articles in journals, magazines, and newspapers. An index will provide a citation which fully identifies the work: author, title of article, title of journal, date of publication, the volume, issue and pagination. An abstract includes a summary of the work being cited. Users can access the “Articles Index” in the library automation software maintained by the library.

Restriction by Date of Publication

Search restriction is a useful technique for avoiding retrieval of too many references in response to a search, by narrowing it down. Upon selecting the option for restricting a search by publication date, the user can enter the required date or range of date. The input screen provides information on the formats for date searching that are available.

Restriction by Language of Publication

It is possible that users can restrict to certain language for the materials. Selecting to limit a search by the language of a publication displays a list of the different languages available in the system. The user has to choose the language and start searching the records required.

Restriction to Periodicals, Monographs, Series etc. (Format)

Selecting to limit a search by the format of a publication displays a list of the different formats available. The user can select the Formats required. The library may have created collections which group together similar types of material e.g. periodicals, monographs, series, etc. To limit the search to only include material from within a specific collection, users can select an option such as Books, Serials, etc.

Save/Download data from the catalogue

The system allows the user to be searched set of bibliographic records to save and download or print. The records can be saved by relevance or chronological or alphabetically depending on the system features.

Non-print Material

Selecting to limit a search by the format of a publication displays a list of the different formats available. The user can select the Formats required. The library may have created collections which group together similar types of material e.g. electronic, print, non-print like CD-ROMs etc.

Services Module

We live in a technologically complex and rich information environment. A library management system provides an effective media to deliver the services to its users be it on the university campus or off campus. Accessing bibliographic databases and conducting the specific searches on various topics, accessing library OPACs, personalized service such as SDI, CASs can be provided at minimal cost and effort. Various kinds of reference services can be generated and provided to the patrons using integrated library automation software. Following Sections will give a brief account on services which are considered for this study.

Inter Library Loan Service (ILL)

Inter library loan (ILL) service provides access to resources not owned by the library. Libraries borrow materials from other libraries and loan materials to other libraries. This may also include facility for reserving a book, if it is on loan in the lending library or lending required documents to other members' libraries. The actual transmission of the book will be through postal mail or through courier services. Success of this service will depend on the cooperative spirit of the participating libraries. Lending and borrowing functions will be carried out from this option.

Document Delivery Service (DDS)

It will enable a library to request another library for a copy of a document to be transmitted via e-mail, fax or photocopy. This service may be largely used for transmitting a few pages from documents such as journal articles.

Web Access (Links from the Online Catalogue)

The online catalog provides one means for accessing electronic resources. Through title searching and subject headings, users can find any electronic journal the library subscribes to and go to that journal through the link provided. The user can find the journal and later following publisher link the user can get hold of the individual articles.

Current Awareness Service (CAS)

List of latest additions to the library namely books; periodicals, patents, standards, audiovisual material or any other can be put into the internal web for user attention.

Selective Dissemination of Information Service (SDI)

User requests are collected through E-mail or pre-defined mechanism. The descriptors are matched against latest available documents and the required users are contacted through E-mail.

Listings Service/ Notification of New Materials

The documents which are added as new collection to the library are listed as New Arrivals List. The list can be sent through email to the concerned users or it can be hosted on the library website.

Routing of Journal

Some libraries follow the procedure of routing of issues among its users before putting for display. The list of members, who are to avail this facility, is to be prepared by the library along with the number of days each of them can avail it. The systematic circulation of serials among the members of the library in accordance with prefixed routine procedure.

Table of Contents Service

The OPAC contains bibliographic records of all the resources in the library. The OPAC records do not contain the contents of the books, journals, videos, etc. Libraries can prepare or provide a link to the internet resources for table of contents of the documents. Many records even contain the Table of Contents of the item and where applicable records will contain links to the full-text of electronic resources, electronic journals and other selected Internet resources.

Bibliographical Enquiry Service

The OPAC contains bibliographic records of all the resources in the library. It only contains information about those items (i.e. bibliographic information) like the author, title, publisher, call number, subject headings,

number of copies, circulation status, etc. If user needs any specific bibliographic information, the required information or list can be generated through the system.

Library Reference Service by E-mail

E-mail is an important communication based services. It enables members in the network to transfer/receive message from any part of the world using data networks to which they are subscribing. E-mail provides facility through which other services like inter-library loan requests, location search in the union catalogue, document delivery, request transmission, referral service and academic communication can be implemented.

The word "reference" in a library context refers reference work, which is the task of providing assistance to library users in finding information, answering questions, and otherwise fulfilling users' information needs.

As we have seen from the above description that the important house keeping operations in Acquisitions, Serials Control, Catalogue, Circulation, OPAC and services module covered by stepwise. Normally an average university library may use all of these functions and features for the routine house keeping operations.

5.4.2 Advantage of Library Automation

A library automation or computer application in library and information functions and services has the following advantages:

① Speed

Information processing is done much faster which ensures better work flow through the library.

② Accuracy

The degree of precision and accuracy in processing information is high. However, it is dependent on the accuracy of information led into the system.

③ **Cost effectiveness**

Operating costs can be reduced if the system is well designed and well managed.

④ **Reduction in library work loads**

Library workloads can be reduced as the computer can do vast amount of work and processing.

⑤ **Improved services to users**

High rate and better quality in performance is possible through the use of computers.

⑥ **Avoid/Elimination of duplication**

⑦ **Easier access to external databases**

⑧ **Provides On-line access and search of information possible.**

Looking at the advantages of Library automation in library functions and services, it is essential that the libraries/information centers should follow the automation system through out Mizoram. It has been observed that most of the libraries in Mizoram are still using the traditional and orthodox systems in their library services which require keeping pace with the changing scenario and acknowledging and utilizing the computers as an internal part of library house keeping and services as libraries in the advanced states.

5.5 **Network Based Information Services in Mizoram- A Plan**

The network based information service which is the viable platform for information exchange, distribution and proliferation of research activities requires to be strengthened in Mizoram

- ☞ Monitoring Information Resources and Services on INTERNET
- ☞ Creating an Electronic Discussion Forum for Library and Information Science
- ☞ Creating E-mail based Bibliographical Database Servers

☞ Monitoring, Filtering and Re-distribution of Discussion Forum Postings.

Today with the emergence of global network infrastructure, wherein local networks (LANs), national and regional networks and international networks are rapidly getting interconnected, a host of networked information services have evolved over the years. Library and Information networks are designed to support basically library and information services.

Library networks offer the services like,

- ◆ Union Catalogue
- ◆ Current awareness & SDI services
- ◆ Authority data
- ◆ Library automation which includes,
 - Acquisition and fund accounting,
 - Serials control,
 - Book and journals maintenance,
 - User services, creation and maintenance of bibliographic databases, etc.
- ◆ Inter Library user services
- ◆ Document Transfer/copy
- ◆ Access to national/ international databases

The details of the above services have already been discussed in the context of Library Networks and their Services. The development of INTERNET has drastically changed the way communication among different libraries, professionals and users is taking place these days.

Communication services offered by computer-to-computer networks like INTERNET include electronic mail, file transfer and remote log-in. E-mail is a store-and-forward messaging facility available on all the networks. It is probably the most widespread of the three network services because it is

often the only way to exchange information among the networks. Users on the networks can also invoke file transfer commands (ftp file transfer protocol on INTERNET) to copy computer files. Remote log-in is the most sophisticated service provided on the networks through programs like TELNET on INTERNET which allows a user at one site to work on a computer at another site.

Network information service applications are developed using these above communication services. An important requirement for wider use of the services is the inter-connectivity, at least for e-mail, among the various networks in the country, including library specific networks like DELNET, CALIBNET, INFLIBNET, etc.

5.5.1 Possibilities of offering different network based information services

There is a wide range of services which can be facilitated through the network based information system. Some of them are described below.

➡ Information Resources and Services through INTERNET

There is urgent need for setting up a network information monitoring facility, consisting of a core group of two to three staff members and a suitable computer connected to ERNET (Education and Research Network which connects the major academic institutions in the country) or similar other networks connecting major library and information centers in the country. Main responsibility of this group should be to systematically scan and monitor information resources and services on INTERNET and provide relevant information to Indian users. Two interesting applications / services that can be offered from this facility which are,

1. Creation and maintenance of a directory of S&T information resources on INTERNET. This can form the basis of both on-demand and in-anticipation referral service. It is also possible to put

this directory on ERNET, accessible by all users on ERNET and other networks in the country, by E-mail and

- 2 Creation and maintenance of an Info server consisting of bibliographic data downloaded from open-domain bibliographic information sources available on INTERNET, e.g. pre-prints of Astronomy and Astrophysics, content pages of top Biological Science journals. Data accumulated in such fashion can be freely made available to our researchers.

➡ **Creating an Electronic Discussion Forum for Library and Information Science**

An electronic discussion forum is an e-mail based conferencing medium for a group of people, geographically far apart, to discuss issues related to their profession or discipline. A forum for library and information science can be established to discuss, for example, issues related to library practices and use of new information technologies in libraries and information centers. Such a forum can also act as an electronic news medium for sharing information pertaining to new initiatives, plans, projects, information sources and services, international development, etc.

While a few real-time electronic discussion forums (also called Bulletin Board, Computer conference, interest group, discussion group, discussion list, etc.) exist today, majority of them use e-mail to set up an informal discussion by interconnecting people of specific interest over a network. Members of such forums can exchange messages with others irrespective of the network they are on and their geographic location. The software used for setting up an electronic discussion forum is known as a mail server. Mail servers are electronic mail delivery systems, which when they receive a message can resend it to a group of users/subscribers whose e-mail addresses are maintained as a mailing list. Each subscriber sees all the mail forwarded by the server and if he/she wants to add his/her

comments on the issue, sends in a message to the server. Many discussion forums also archive the messages and support batch search and retrieval from the archive. Several hundred such electronic discussion forums exist globally today. They are bringing radical changes in the conduct of research and scholarly communication. One example of a discussion forum for librarians and information specialists is the Public Access Computer Systems (PACS-L) forum, moderated from the University of Houston, USA. PACS-L participants discuss many topics ranging from specific hardware and software considerations to issues involving online catalogues, CD-ROMs, networking and locally mounted databases.

While such a forum will improve communication among the professionals in our country, it will also encourage librarians to develop more sophisticated network skills and to explore more fully the potentials of electronic communication.

➡ **Creating E-mail based Bibliographical Database Servers.**

While online, interactive searching of bibliographic databases is a desirable feature, e-mail based access is an interesting and less expensive solution considering the computing and network technologies currently used by our libraries and information centers. It is not difficult to create an e-mail based front-end to a bibliographic database, which will receive user queries, formulated in a specific syntax, by e-mail, carry out the search and the results to the user, by e-mail.

➡ **Monitoring, Filtering and Re-distribution of Discussion Forum Postings**

As already mentioned earlier, several hundred discussion forums exist today on INTERNET on a wide variety of topics. The messages posted on these forums are an important source of information, raw knowledge and often untried new ideas. There is a need to identify important forums, in

the context of our research priorities, scan these regularly, extract significant postings, and re-distribute these among our researchers. Such messages could also be archived into a database.

Such a service will help our scientist to become part of the international network of scientists in their field of specialization and get to know the latest developments and research results, well before these appear in published form. This will have positive influence on ongoing research and stimulate new directions in research. Furthermore, such a service will relieve an individual researcher from the burden of getting to know what discussion lists exist, procedure for their subscription, usage, etc. Even if this were to be possible, this will result in 'network flooding' due to multiple subscribers to the same list and subscription of multiple lists by one person. The cumulative time saved by use of a single facility of this type will be enormous.

Thus we see that networks are radically changing the way information is disseminated. Several useful network information services can be provided to researchers in the country using just e-mail facility. More sophisticated network information services could be evolved as the time progresses. This would also give the Library/Information professionals the required time and experience to plan for better coordinated efforts.

5.6 Conclusion

Over the decades, there has been tremendous change in the Information Technology field.

Changes have forced the Information professionals to look for effective and efficient methods for processing, storing, and retrieving information. Increase in the number of users and their varieties of needs have forced the libraries to apply new technologies and techniques for information storage and retrieval. The emerging trends in computer, communication, and publishing technologies for wide spread distribution of information is

also forcing the libraries to undergo substantive structural modification. LIS professionals have to put more efforts and enrich their knowledge to migrate to electronic from print media.

From the above discussions it could be found that, Internet has become a challenging and most viable platform for the Library and Information Science professionals for providing better services, thus improving the image of library among the user community. The services mentioned here are few but for maximum usage of internet facilities, a librarian as a professional needs to become network literate and in turn needs to provide programs and facilities to his/her customers. Adequate training to the staff and inclusion of IT subjects in the curriculum will help the library profession. Analysis of data is given in following chapter-6 entitled “Data Analysis and Finding”.

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Chapter – 6

DATA ANALYSIS AND FINDINGS

6.1 Introduction

The main purpose is to study the possible areas where the application of Information Technology (IT) is made as a part of overall improvement in the college libraries services, and also to understand the pace of accepting the emerging IT particularly Internet in the college libraries. The study also focuses on implications arising out of IT applications, the strategies and future plans to formulate an integrated information system. The scholar has taken all possible measures to find out the information and as such, pursued the research through a pilot study to see the feasibility of serving the questionnaire to the librarians. All the 27 colleges were covered under study for the purpose. Further, the scholar also critically viewed the responses from the librarians and certain ambiguities could be resolved to draw the final questionnaire for a detail study.

The data were collected from various sources including the questionnaire which was designed for the purpose. Mention may be made that, there are altogether 27 colleges which include 21 Government Colleges including one constituent college, and 6 Private colleges and the list of colleges covered under the study has been shown in Annexure-II.

ANALYSIS OF DATA

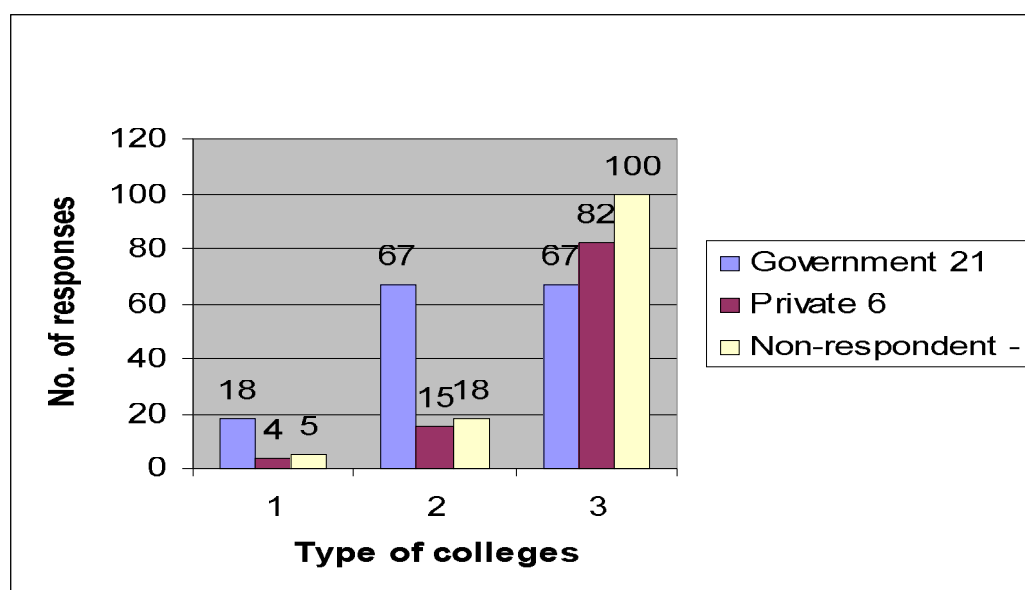
6.2 Analysis by number of responses

All the 27 college librarians were served with the structured questionnaire covering various facets to reveal information of the concerned college. The information regarding responses has been shown in Table-8 along with the supported Graph-1 for better information.

Table-8: Number of Responses

Type of college	Total No. of colleges	No. of responses	% of responses	Cumulative %
Government	21	18	67	67
Private	06	04	15	82
Non-respondent	-	05	18	100
Total	27	27	-	100

Analysis of the above table reflects that, out of 27 colleges both Government and Private, 18 colleges (67%) have responded to the questionnaire followed by the 04 (15%) private colleges out of a total number of 21 Government and 06 private colleges respectively. A total number of 05 colleges out of 27 which comes to 18% did not respond to the questionnaire. The above fact shows that, the librarians have shown their interest to reveal the required information concerning to their college.

Graph – 1: Number of Responses

6.3 Analysis by number of Collection Developments

Collection Development happens to be one of the primary components in any academic libraries and college libraries are no exception to it. Healthy collection development signifies the strength of a library which facilitates the librarian to provide better services to its users. The scholar formulated

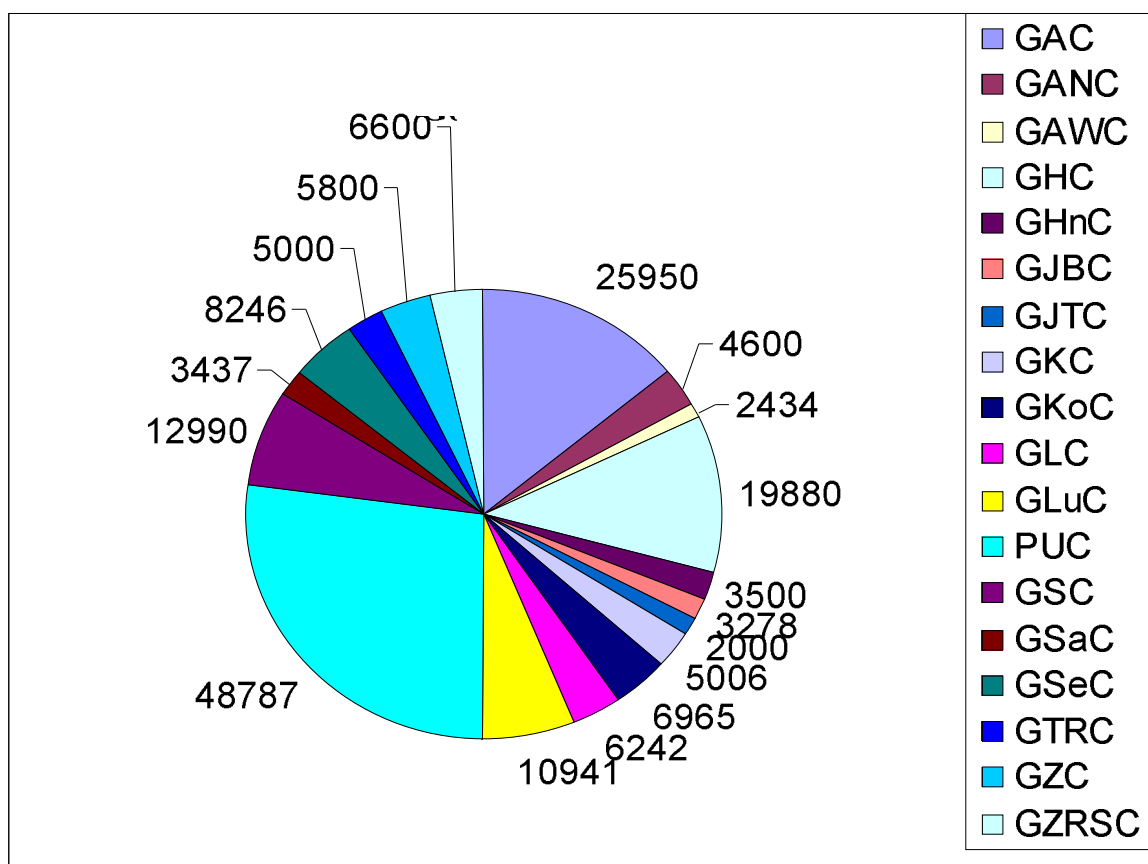
one of the components in the questionnaire which were served to the college libraries under study in Mizoram to find out the information pertaining to the collection development of the respective college. Information regarding to collection development in regards to books and journals of all the 27 colleges both Government and Private have been depicted below in Table- 9 supplemented with Graph-2 (A) for books, Graph-2 (B) for Govt. college libraries and Graph-2 (C) for Private college libraries respectively for better visualization of information.

Table-9: Collection Development of the college libraries

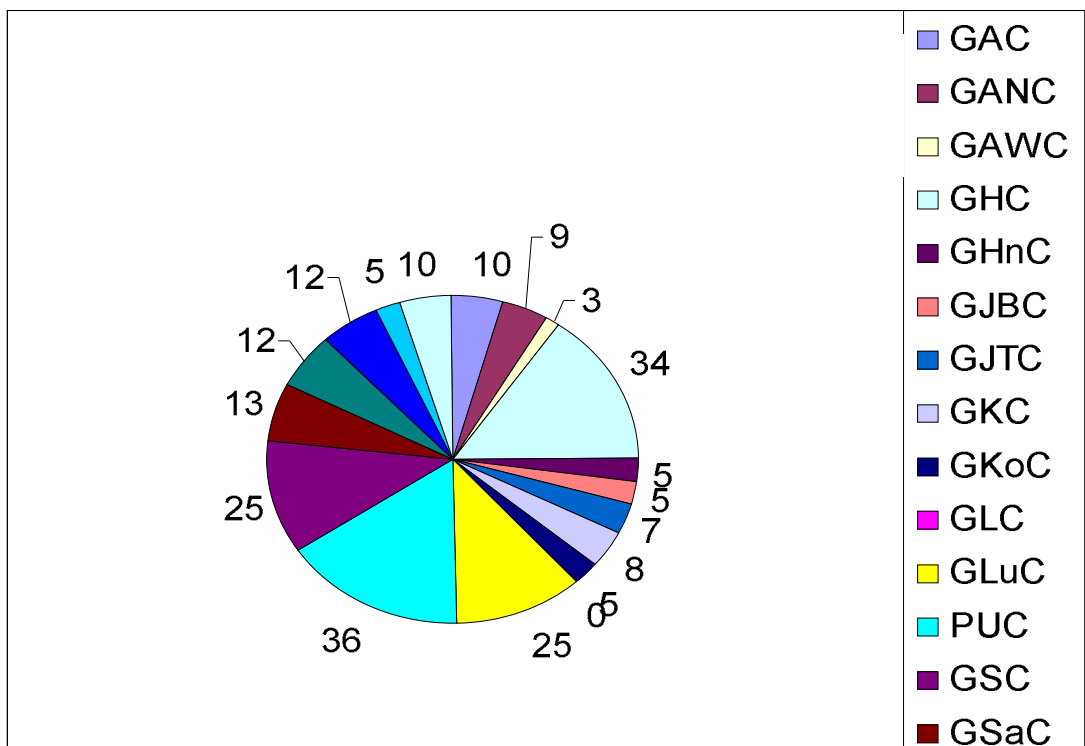
Sl.No	Description of the college	Total No. of books	Total No. of Journals
Government College			
1.	GAC	25950	10
2.	GANC	4600	09
3.	GAWC	2434	03
4.	GHC	19880	34
5.	GHnC	3500	05
6.	GJBC	3278	05
7.	GJTC	2000	07
8.	GKC	5006	08
9.	GKoC	6965	05
10.	GLC	6242	00
11.	GLuC	10941	25
12.	PUC	48787	36
13.	GSC	12990	25
14.	GSaC	3437	13

15.	GSeC	8246	12
16.	GTRC	5000	12
17.	GZC	5800	05
18.	GZRSC	6600	10
Private College			
19.	CZC	753	05
20.	KC	500	04
21.	MLC	5437	06
22.	SC	300	05

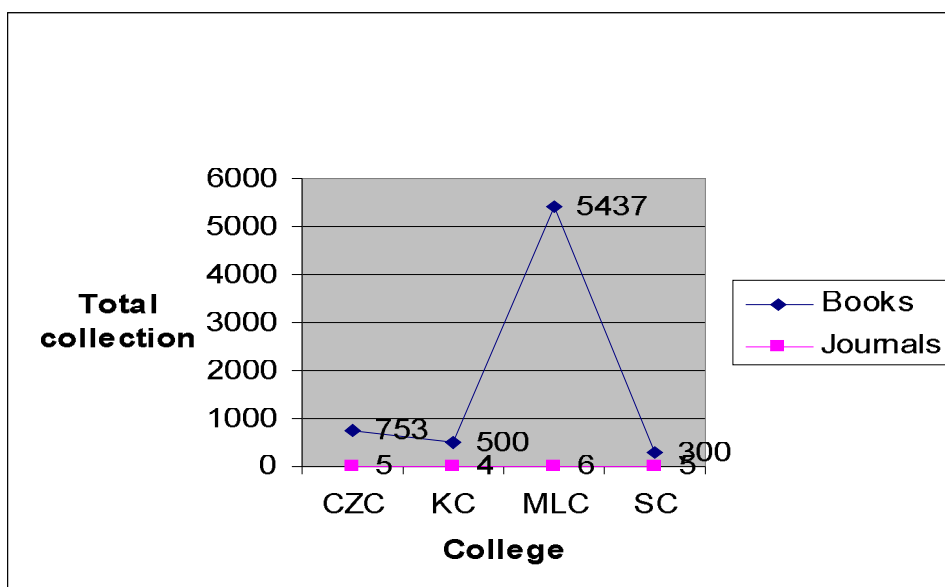
Graph – 2 (A): Collection Development of Govt. College Libraries



Graph – 2(B): Collection Development Journals of Govt. College Libraries



Graph – 2 (C): Collection Development of Private College Libraries



It is deduced from the above table that, Pachhunga University College (PUC) has the highest collection of books i.e. 48787 followed by

Government Aizawl College (GAC) i.e. 25950 and Government Hrangbana College (GHC) 19880 respectively and hence, occupy first, second and third position respectively and all the colleges are the Government colleges including one constituent college of the Mizoram University. While analyzing the table further, with regard to the collection development of Private college libraries it could be revealed that, Mizoram Law College (MLC) has the highest collection of 5437 followed by the libraries of C. Zakhuma College and Kamalanagar college who has a collection strength of 753 and 500 respectively.

With regard to the procurement of journals in the college libraries it could be deduced from the above table that, only the libraries of Pachhunga University College and Government Hrangbana College subscribe 36 and 34 no. of journals and hence, ranks the first and second position respectively. It is surprising to note that, both the libraries of Government Lunglei College (GLuC) and Government Saiha College use to subscribe 25 no. of journals each and both the college libraries rank the third position.

The scholar while interacting with the librarians of the other colleges could deduce that, due to financial constraints in the libraries the libraries could not subscribe to the journals which are the need and basic requirements of the users. Further, it is interesting to note that, most of the Government college libraries including the private college libraries taken under study are very poor with regard to procurement of journals for their respective libraries and as such, the users are not getting the update information in their subjects.

6.4 Analysis by Allocation of Budget

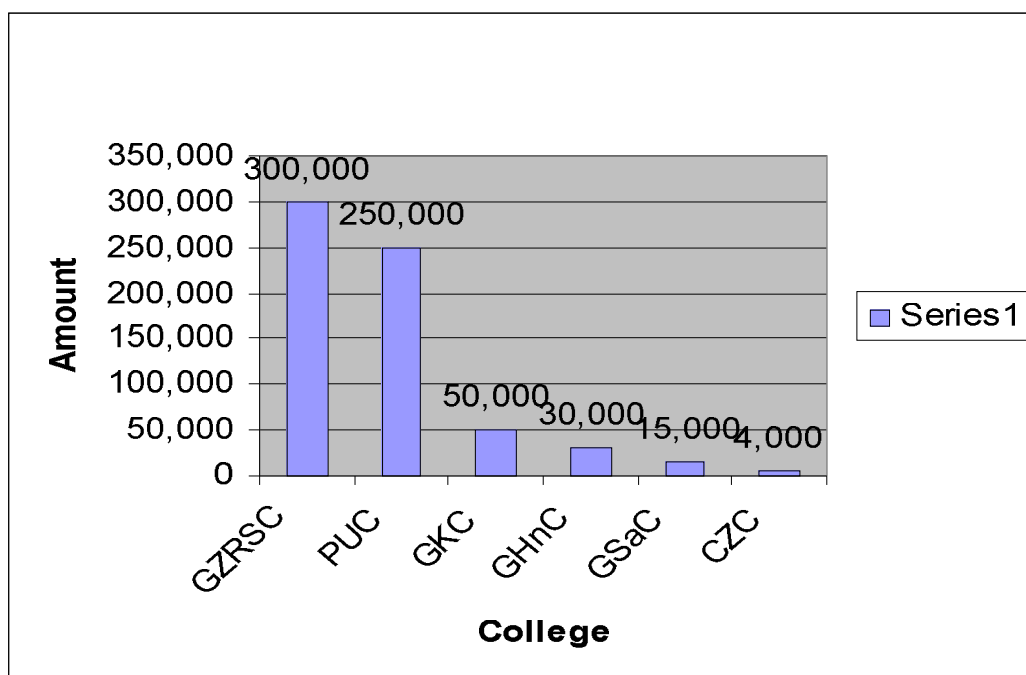
Budget happens to be one of the mandatory parameters of the library administration. Allocation of budget annually to the library enhances the services including the implementation of innovative services to the users'

communities. It also helps the librarian to strengthen the library with a sound collection development including other associates services.

The scholar put forth the information regarding the allocation of budget of different college libraries both Government and Private collected through the questionnaire in Table-10. The scholar in spite of his best efforts could not obtain the right information regarding allocation of budget to the libraries under study. However, some of the college libraries submitted their allocation information or other policies to strengthen their library resources. Hence, the libraries who responded with their budget allocation have been tabulated as under which has been supported with the Graph-3 for better clarity of information.

Table-10 : Allocation of Budget

Sl.No	Description of the college	Total Budget allocation in Rs.
Government College		
1	GZRSC	3 lakhs
2	PUC	2.5 lakhs
3	GKC	50,000
4	GHnC	30,000
5	GSaC	15,000
6	CZC	4,000

Graph – 3: Budget Allocation

While analyzing the data under Table-10 about the allocation of budget available to the libraries of both Government and Private colleges it could be revealed that, out of 22 libraries 6 college libraries focused the relevant information which comes to 27% in total. Maximum a sum of Rs. 3 lakhs were allotted to the Government Zirtiri Residential Science College library (GZRSC) followed by 2.50 lakhs to Pachhunga University College library (PUC) and 50 Thousand to Government Khawzawl College (GKC) library and hence, ranks first, second and third position. It is interesting to note that, Pachhunga University College being the constituent university college has been allocated less than the allocation of budget to the Government Zirtiri Residential Science College which is owned by the State Government. Further C. Zakhuma College, being one of the private colleges allocates a sum of Rs. 4000 per annum and though it is fewer amounts still then, annual allocation is available to the library which is an encouraging step of the concerned management authorities. 02 (9%) number of college libraries such as Government Hrangbana College and Government T. Romana College out of 22 college libraries under study,

however, spelled that they collect Rs. 75 per student per year as library fee and develop their resource strengths. The management of the concerned colleges, however, does not provide any additional grant to develop the resource strength of the concerned library.

6.5 Analysis by Human Resource

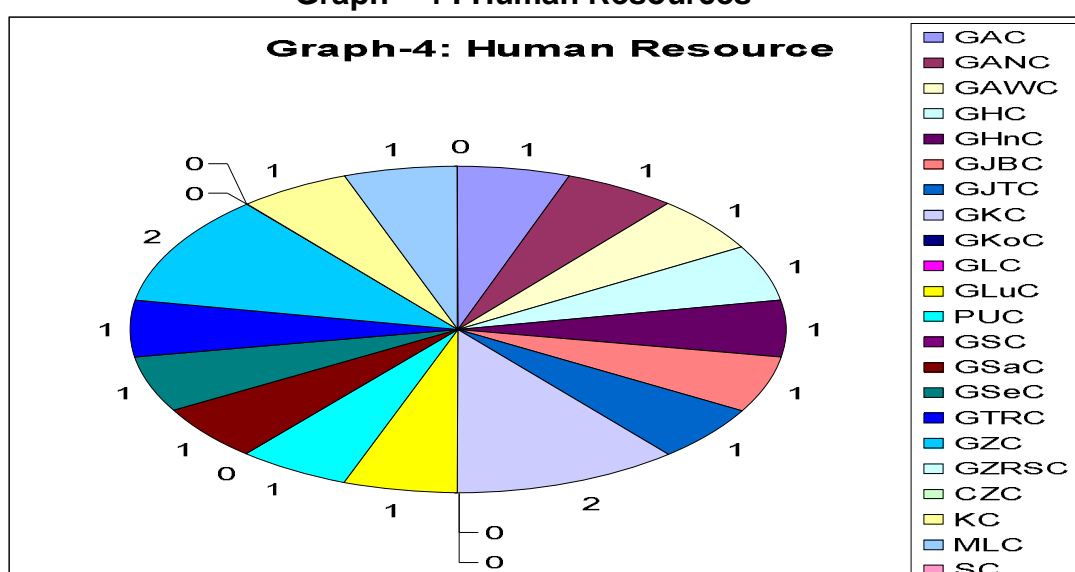
Human Resource especially with technical qualification is the real backbone of any library system. Manpower is imminent in view of completing the multifarious works in the library which includes, circulation, cataloguing, classification etc. including data inputs in computer, searching of information from Internet etc. and to provide the same for the use of users communities in the library. The data regarding the manpower available in various colleges were collected to find out the strength of the competent man power in the college libraries and the same has been presented in the Table-11 supplemented with Graph- 4 by the scholar for a clear understanding. The collected data from the questionnaires have been tabulated below under three broad headings such as, Professional, Semi Professional and Non Professionals in the libraries under survey.

Table-11 : Human Resource in College Libraries

Sl.No	Name of the college	Professional	Semi Professional	Non Professional
1.	GAC	01	00	02
2.	GANC	01	01	01
3.	GAWC	01	01	01
4.	GHC	01	00	04
5.	GHnC	01	00	00
6.	GJBC	01	00	00
7.	GJTC	01	00	01

8.	GKC	02	00	00
9.	GKoC	00	02	01
10.	GLC	00	00	01
11.	GLuC	01	00	01
12.	PUC	01	04	07
13.	GSC	00	01	00
14.	GSaC	01	00	02
15.	GSeC	01	00	01
16.	GTRC	01	00	01
17.	GZC	02	00	00
18.	GZRSC	00	00	01
19.	CZC	00	01	01
20.	KC	01	00	01
21.	MLC	01	01	01
22.	SC	00	00	01

Graph – 4 : Human Resources



While discussing the human resources available in the college libraries under study it could be found out that, out of 22 libraries under study only 01 (One) library i.e. GKC (Government Khawzawl College) Library is having 2 number of professional hands which comes to a total of 9% only. It is further noticed that, 14 libraries each is having only one professional which constitute 5% each while 6 libraries out of a total number 22 college libraries do not have any professional hands.

While discussing about the semi-professional positions in all 22 libraries covered under the study, only PUC library i.e. Pachhunga University College library is having 4 numbers of semi-professional persons and it constitutes 18% in total. Again, only GKoC (Government Kolasib College) library is having 2 number of semi-professionals (9%) in total among the libraries under study. It could be further pointed out that, 5 number of College Libraries including one private college library which constitute 22% in total have only 01 semi-professional while, 15 College Libraries including 02 private college libraries do not have any semi-professional.

However regarding non-professionals hands available in libraries under study, 01 (one) college library i.e, PUC (Pachhunga University College) is having 07 number of non-professional persons which comes to 32% in total while the GHC (Government Hrangbana College) Library is having 04 (18%) number of non-professionals hands. Further, while 02 College libraries are having 02 numbers of non-professionals each i.e, 9% each, 13 College Libraries are having only 01 professional each which comes to 5% each and 05 College Libraries do not have any non-professional hands.

Hence it could be revealed from the above table and analysis that, the non-professional hands are more than that of professionals i.e. 28 and 18 respectively in total followed by 11 semi professionals in total. This shows that, due to absence of more technical hands i.e. professionals the library services are hampered to a great deal and ultimately, the users are

affected. Hence, sporadic attempts required to be taken by the concerned Government as well as the management authorities of the respective college for more appointments of professionals in their respective libraries.

6.6 Analysis by College Library Automation and Networking

Library automation and networking has become imminent in view of proliferation of information especially in a library. Paradigm shift in using learning resources and research materials from print to digital format through network base has given momentum to the researchers and academicians in the past few years. While continuing to provide traditional source materials in their original format to scholars' onsite, libraries are moving aggressively into the new world of electronic creation and dissemination of information. Electronic technology offers new methods of making collections more accessible to researchers through networks. The propagation of rare information on increasingly unstable media, create an imperative for libraries and the communities that they serve to act energetically and collaboratively to ensure that the record of this century, as well as that of previous ones, is carefully selected and preserved before that record erodes and degrades. A number of library networks exist at national and international level to provide the access to various resources including the holdings of libraries participating in the program, access to Internet resources, training etc. The libraries working in networking environment gets benefit of accessing information in other libraries through the library networks.

Taking the need of automation and networking as a pioneer factor to be effective in the college libraries under study, the scholar obtained the data in the relevant area through the questionnaire pertaining to different college libraries under study and the same has been tabulated under Table-12 supported with Graph- 5 (A) and Graph-5(B) reflecting Hardware and Software available in 11 college libraries each for a clear vision of

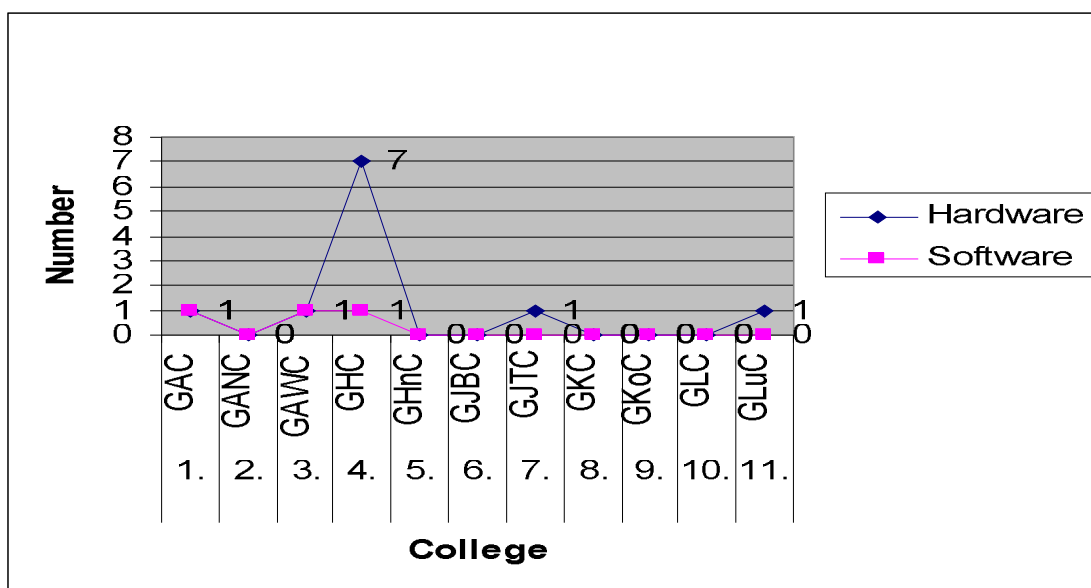
information. The data, however, reflects only to the Hardware and Software being used in the respective college libraries as no other areas such as OPAC services or House Keeping Operations were being introduced in the college libraries.

Table-12: Library Automation and Networking

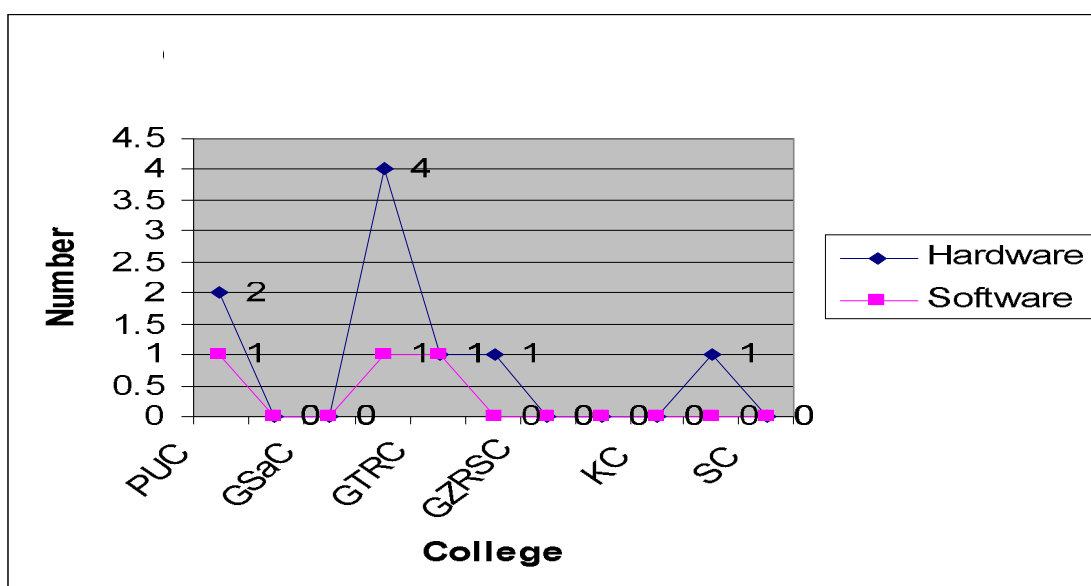
Sl.No	Name of the college	Hardware	Software
1.	GAC	01	01
2.	GANC	00	00
3.	GAWC	01	01
4.	GHC	07	01
5.	GHnC	00	00
6.	GJBC	00	00
7.	GJTC	01	00
8.	GKC	00	00
9.	GKoC	00	00
10.	GLC	00	00
11.	GLuC	01	00
12.	PUC	02	01
13.	GSC	00	00
14.	GSaC	00	00
15.	GSeC	04	01
16.	GTRC	01	01
17.	GZC	01	00
18.	GZRSC	00	00
19.	CZC	00	00

20.	KC	00	00
21.	MLC	01	00
22.	SC	00	00

Graph – 5 (A) : Hardware & Software



Graph – 5 (B) : Hardware & Software



While analyzing the data with regard to college library automation and networking, the hardware and software components have been taken into cognizance as no other components have been filled up in the questionnaire. Analysis revealed that the only GHC (Government Hrangbana College) library is having 07 computers in the library which comes to 32% followed by GScC (Government Serchhip College) library which possess 4 computers (18%). The PUC (Pachhunga University College) library however, use only 02 computers for its library which constitutes only 9% and 07 other libraries are having only one system each for their library by constituting 5% each. Moreover, 12 College Libraries do not possess any computer for their library use.

While discussing about the use of Software in the library, 06 (six) College Libraries use SOUL (Software for University Library) and it constitutes 27% in total. Further out of these college libraries, only 1(one) College Library i.e. Pachhunga University College Library use SOUL (University version) while other 05 (five) College Libraries use the SOUL (College Version). The rest of 16 College Libraries do not use any library software.

It is interesting to note that, 04 (Four) College Libraries do not use any library software, though they are having one computer each in the respective library. Hence it can be deduced that, the libraries due to lack of sufficient professional hands including budget constraints in 02 (Two) College Libraries i.e. GJTC (Government J.Thankima College) and GLuC (Government Lunglei College) could not procure the library software. Moreover, other 02 (Two) College Libraries i.e. GZC (Government Zawlnuam College) and MLC (Mizoram Law College) though are having good professional strengths could not procure the library software due to the financial problems.

Financial constraints, lack of professional strengths in the library along with the administrative tribulations including the expertise in the computer fields added serious problems for establishing networking in the libraries.

6.7 Analysis by Digitization

Digitization happens to be an integral part of library automation. Most of the automated libraries are interested in digitization as a way to make artifacts more accessible, particularly those artifacts that are rare and fragile. In addition, digitization provides support for duration and restoration activities, for insurance and disaster recovery. While the majority of the libraries do not deal with born digital objects, they provide significant digital resources for scientific investigation, valuable access points to materials that are physical and which, therefore, can “reside in only one place,” and “benchmarks” for various scientific investigations and analyses as in the case of taxonomic voucher specimens. Digitization allows the records, information along with images created during the process can be made accessible via the web.

While analyzing the data of the College Libraries obtained through the questionnaire, no library under the purview of the study has taken the steps for digitization in view of the fact that the libraries are not fully automated. However, 03 (14%) of College Libraries have submitted their proposal to the respective authorities for providing necessary funds including tools and manpower to start the digitization process in the libraries. Further mention may be made that, only 01 (one) (5%) out of 22 College Libraries has its own web site which can be accessible through Internet. The web site is www.hbc.org.

6.8 Summary

The scholar while making an analysis to the problems encountered by the librarians of the respective colleges under the purview of the study obtained through the questionnaires has summarized as under.

- ◆ 14 (64%) number of librarians have expressed about the availability of inadequate funds to their respective libraries.

- ◆ 6 (27%) number of librarians have viewed about the non existence of sufficient technical hands in the library.
- ◆ Lack of infrastructure facilities are found to have been opined by 4 (18%) of librarians.
- ◆ Non-availability of computers and other associated accessories are not available in 14 (67%) of libraries taken under the purview of study.
- ◆ 10 (45%) librarians have expressed the non-availability of Internet connectivity.
- ◆ 13 (59%) librarians have expressed their view that, the Government authority have not initiated for the development of the library.
- ◆ 2 (9%) librarians have viewed that due to non-availability of library building the necessary library services could not be made out the users and this also affects to the library automation.

6.9 Findings

The scholar deduced with the following findings after interacting with the librarians of the colleges under the purview of the study and after due analysis of the questionnaires.

- * Financial constraints in the libraries are the major components which have seriously affected the libraries for not subscribing scholarly journals which are the need and basic requirements of the users.
- * Most of the Government college libraries including the private college libraries taken under study are very poor with regard to procurement of books for their respective libraries and as such, the users are not getting the update information in their subjects.
- * Lack of professional strengths in the library along with the administrative tribulations including the expertise in the computer

fields added serious problems for establishing networking among the libraries.

- * Lack of sufficient infrastructures including the computers and other accessories seriously affected the automation process.
- * Electronic sources of information could not be access due to poor connectivity of Internet.
- * Constraint policies of the Government and other management authorities seriously affected the library services.
- * Library professionals are found not have been duly recognized.
- * Digitization process in the libraries is worst effected due to lack of automation in the libraries.
- * Many of the college libraries lack minimum hardware and most of the libraries do nor have software package.

Chapter-7

SUGGESTIONS AND CONCLUSION

7.1 Introduction

The success of Library depends upon the effective utilization and management of Information Technology (IT) applications in libraries. Libraries use IT to increase the efficiency, productivity and effectiveness of their operations and services. Libraries in India are increasingly using the integrated library software for their various library housekeeping operations and services. The present study has attempted to study the Strategic Developmental Plan for Adoption of Information and Communication Technology (ICT) in the College Libraries of Mizoram. It provides a broad overview of the physical infrastructure and resources of libraries in general and impact of Information and Communication Technology (ICT) in housekeeping operations, services and administration in particular.

An attempt has been made to highlight the overall strengths and weakness of the integrated systems' functions, features and services. Inferences were drawn from the analysis of the data. Subsequently, the following findings have been evolved.

All academic libraries virtually depend on the IT systems for their basic operations such as acquisitions, cataloguing, circulation, serials control etc. The development of IT based systems by organizations with which the libraries deal and within the institution it has meant that much closer attention has to be paid to the integration of the library's system with others. The functions that are required to provide effective delivery of information requirements need to be integrated. The integrated college library and information system can provide one-stop information services using the state of the art information technology tools. The system designed to serve as integrated college library and information system is expected to cover all the aspects required so that the integrated system can support technologies such as Internet, electronic publications etc to

provide integrated services. The vast information sources which the library gives access to are not only the item held by or owned by the library but also given access to remote information sources and handling the resultant requirements to authenticate and authorize users. These are the key challenges for the modern academic librarian (Wendi, Arant, 2001).

In the context of new millennium, a university's position should be advanced as a leader among the colleges and universities in using the information technology and library services in providing an enriched learning environment. There is a desperate need for a college to make information technology and library services a pervasive and transparent part of the lives of students, faculty and staff. The information resources are pervasive when they are available to every one. Those resources are transparent when information, applications and services are available without any delay or limitation of hardware/software etc. Users must experience information resources as seamlessly integrated into their activities. An integrated college library and information system can provide pervasive access to information resources; to have a greater return with the use of computer and communication tools to return meaningful results for the benefit or research and academic community.

Further, technological advances are creating a number of issues and challenges with respect to resource collection, organization and services. However, the most immediate challenge to college libraries will be one of developing strategies to manage the transition from the print version to the electronic version. Library professionals will recognize the importance of obtaining the necessary skills required to become competitive, and function effectively in the information age of twenty first century. The degree of knowledge and skill level required for librarians will be dictated by the needs of information sources made available to support the curriculum for the research. The librarians of the present age must often

be familiar with both print and electronic versions to help serve the information needs of several levels of library patrons.

Further, there will be a shift away from many traditional library practices that were once deemed as the core of library services and collections. Electronic resources have actually created more opportunities for patrons as well as for library professionals also. The challenge for librarians will be to learn to strike a balance between collection and providing access to print and electronic resources. In addition, librarians must keep in mind the needs of patrons as the resource of the library, as they build collections and prepare access. The professionals who keep pace with emerging technologies will be able to serve the basic information needs of the library patron.

The driving force in creation and use of information in the current millennium will be the integration of Internet/ World Wide Web and standards of all computer applications operating in the networked environment. The rapid enrichment of resources electronic form combined with immediacy of access will make the electronic medium an essential component in the work environment of students and scholars in all disciplines at all levels. Academic libraries are facing increasing pressures from multiple sources. Libraries can no longer be expected to support research and development from their own resources due to the information explosion, increasing cost of library materials, shrinking library budgets etc. The level of collection development is declining at a faster rate and is restricted to core collection to serve the immediate needs of the user's community.

This situation calls for cooperation in developing collections to make maximum use of their existing resources. The librarians have to come together and move towards resources sharing to reduce the common costs and will continue to be dynamic provider of all types of information by establishing an integrated College library and information system to

offer users extended services. It is essential to take into consideration all the components that the integrated facets and system components built into the ideal electronic library interface taking into account the information needs of everyone and their expectations with regard to access, functionality and personalization.

With the advent of electronic information era and network based information services, libraries all over the world are computerizing their services and connecting their library resources in electronic form. India is estimated to have around 65,000 libraries that include public libraries, college libraries, university libraries, and departmental and other libraries. Computerization of library services has been slow in India so far and it is expected to turn into a movement in the coming years given the requisite attention. How the libraries are evolving the world over and the current status in India are summed up in the following Table-13.

Table-13: Current Status of Libraries in India

S.No.	Library Type	Characteristics	Current Status
1.	Traditional Library	Holdings in hard copy form. No computerization	>97.1% libraries
2.	Automated Library	Automation of library functions – computerized catalogue, circulation, acquisition, etc. Holding mostly in print form A few electronic resources	< 3.1 libraries
3.	Electronic Library	Fully automated functions CD-ROM networking Resources in electronic and conventional form	< 100 libraries
4.	Digital Library	Fully automated All resources in digital form High speed optical fiber LAN	Experimental
5.	Virtual Library	Library without walls Provides access to resources Library without resources	Research

From the table we notice that, in most of the libraries in India, IT applications have yet to take root. They are still using the traditional and orthodox systems in their library services. Whatever small automation of library function and services has been done, it is in academic and government libraries. Public libraries are lagging behind; they have not properly planned to make use of modern tools in their public libraries.

7.2 Summary of Findings

The scholar deduced with the following findings after interacting with the librarians of the colleges under the purview of the study and after due analysis of the questionnaires.

➔ **Manpower**

Paucity of technical manpower and government ban on recruitment is a matter of great concern for many colleges, which are run with very limited staff. However the findings of the study depicts that the application of information technology smoothens the activities of information handling. Computer Science professionals have been given an opportunity to work in many libraries for the purpose of introduction of IT. Many respondents do feel that assistance from computer person is essential, however few librarians have expressed that, library science background with marginal computer application knowledge goes a long way in speeding up the library automation work.

➔ **Budget**

Drastic budget cut for books and serials is observed every where and majority of libraries have very limited budget for Journal subscriptions.

➔ **IT infrastructure- Hardware**

The data with regard to availability infrastructure shows that many colleges have procured the computer systems from time to time but does not have a provision to update the computer configuration. It is opined

that the infrastructure created becomes obsolete in less than 5 years and libraries needs additional support. It is interesting to note the study that the colleges introduced IT recently have got all the sophisticated computer system as compared to other colleges who implemented the computers early.

➔ ***Network tools***

Libraries have network connectivity using the available data networks viz. NICNET, VSNL, ERNET, Private ISP's etc. But most of the libraries have dial up access very few having leased line connectivity.

➔ ***Membership***

Majority of the libraries are connected to INFLIBNET are availing the services of the Centre and found it useful. However they felt that, there is a need for a strong network connecting. It is opined that though INFLIBNET is providing access to various data bases, but the data bases are not as comprehensive as it should be.

➔ ***Database development***

The development of the databases in the College libraries is very poor with only small portion of the data is created in Machine Readable form. The database of technical reports, standards, patents, manuscript etc is lacking though in many colleges these collection are in good number.

➔ ***Standards***

Many colleges have used CCF standards to input the data. Most of the libraries follow AACR2 format for rendering the entries.

➔ ***Software for Database creation an in-house operations***

Many libraries have using CDS/ISIS for data creation. Libraries use the same software for both data entry and in-house operations. Finding of the

study shows that the software is being used in many libraries for housekeeping functions is SOUL.

➔ ***Factors that have influenced the computerization***

Desire to increase efficiency and new services has got highest score, however all other factors listed have also scored well viz. Library wanted to be part of the worldwide trend in computerization. Principal of the institution have shown interest in this regard. Availability of grants from UGC/ INFLIBNET, desire to be part of INFIBNET and other networks, interest evinced by the management and subsequent increase in funds followed by the users demand for computerization and Library Committees keen desire are some of the things that clearly visible.

➔ ***Services***

Many colleges have not completely computerized their activities but they desire to provide automation-based on Internet.

➔ ***Human Resource Development***

Many College libraries have the provision for training the manpower to handle the information technology tools.

➔ ***Service Implications***

There is overall improvement in the library services with the introduction of IT applications. Libraries also avail services through INFLINBET to serve their users.

➔ ***Preparedness and future plans***

Preparedness of colleges is encouraging as they have shown willingness and feel that with the existing staff also they can introduce new IT tools in the libraries. Libraries need a person with basic degree in computer science to look after the technical activities.

➔ ***Future plans***

At present many libraries are in transition period, and feel that the introduction of these tools is essential. The factors relating to automation of individual libraries, membership to library networks, providing electronic document delivery services, access to electronic resources, placing library on the web, cataloguing of Internet resources, etc are some of the future plans of the libraries.

➔ ***Factor for Integrated College library and information system***

The College libraries have to act as one point solution to the research and academic users and look for an integrated solution to their requirements. The pre-requisites list in the questionnaire has scored well in respect of introduction of these factors.

While analyzing the data with regard to college library automation and networking, the hardware and software components have been taken into cognizance as no other components have been filled up in the questionnaire. Analysis revealed that the only GHC (Government Hrangbana College) library is having 07 computers in the library which comes to 32% followed by GScC (Government Serchhip College) library which possess 4 computers (18%). The PUC (Pachhunga University College) library however, use only 02 computers for its library which constitutes only 9% and 07 other libraries are having only one system each for their library by constituting 5% each. Moreover, 12 College Libraries do not possess any computer for their library use.

While discussing about the use of Software in the library, 06 (six) College Libraries use SOUL (Software for University Library) and it constitutes 27% in total. Further out of these college libraries, only 1(one) College Library i.e, Pachhunga College Library use SOUL (University version) while other 05 (five) College Libraries use the SOUL (College version). The rest of 16 College Libraries do not use any library software.

It is interesting to note that, 04 (Four) College Libraries do not use any library software, though they are having one computer each in the respective library. Hence it can be deduced that, the libraries due to lack of sufficient professional hands including budget constraints in 02 (Two) College Libraries i.e, GJTC (Government J.Thankima College) and GLuC (Government Lunglei College) could not procure the library software. Moreover, other 02 (Two) College Libraries i.e, GZC (Government Zawlnuam College) and MLC (Mizoram Law College) though are having good professionals strengths could not procure the library software due to the financial problems.

7.3 Problems and Suggestions from Librarians

While implementing the information and communication technologies (ICT) in library activities and services, various types of problems were encountered by the libraries under survey. Librarians have rightly highlighted the important problems and suggested some solutions for implementation of automation and networking of College libraries in India, which are worthwhile to mention here,

- ★ Non-availability of good integrated library software at affordable price.
- ★ Lack of technical support for implementation of integrated library software.
- ★ Lack of proper guidelines and planning for computerization of library activities.
- ★ Non availability of full- fledged standard multilingual library software which is causing hindrance in developing database of Indian language collection.

- ★ The available ILS in College libraries lacks the features of Z39.50 interface which could have helped in downloading records from other libraries.
- ★ College libraries are not able to use the RFID interface because the available ILS lacks these features.
- ★ Appointment of a full time systems administrator to support the information technology applications in libraries.
- ★ Union catalogue developed at INFLIBNET should be made functional to download bibliographic records of book database.
- ★ Modern IT infrastructures should be launched in library to link the national level network.
- ★ Adequate funds should be allocated for library.
- ★ Library building should be functional
- ★ College librarian should take as a challenge to start library automation and digitization for development of library
- ★ Conducive environment needs to be established for proper launching and functioning of networks among the college libraries in the state.

7.4 Suggestion for successful Implementation of ICT in College Libraries of Mizoram

Some of the problems which come in the way effective implementation of automation in College libraries may be common in nature across the country. The library professionals should take the modernization of the College libraries in India as challenge. The views and comments offered by the librarians and outcome of the research have enabled the

investigator to offer some feasible suggestions for achieving the optimal utilization of library resources and services. They are given as follows,

- ⇒ For the successful implementation of the application of ICT advice from the experts or consultants should be sought.
- ⇒ In the light of the present study it is essential on the part of the State and Central Government to make an effort to ensure and appoint qualified college librarian to achieve the highest degree of success.
- ⇒ Library professionals must be initiated to make an effort to equip themselves to tackle the technical difficulties to the extent possible.
- ⇒ A common mechanism is devised to procure the library materials avoiding the duplication in the procurement.
- ⇒ Provision requires to be made to update the infrastructure time to time and necessary funding be allocated every year. Need for support from agencies like INFLIBNET-UGC, NEC, DONER etc may be made available.
- ⇒ It is suggested that, uniformity in the use of operating systems, database management systems, library house keeping software etc should be maintained.
- ⇒ Each college must have campus network facility connecting all the departments.
- ⇒ Libraries must be connected to other library networks connectivity and these library networks facilitate quality information resources for the benefit of academic users and provide better access to electronic resources.

- ⇒ In the absence of comprehensive union catalogue, national networks like INFLIBNET must create such catalogue. Similarly efforts are to be done by the other networks viz. ADINET, BONET, DELNET, PUNENET etc.
- ⇒ The national union catalogues must be based on OCLC and LC databases giving maximum details following MARC-21 standards.
- ⇒ Access to rare collections such as manuscripts, standards, patents, technical reports, rare collections etc. is essential and the task must be completed in a time bound manner.
- ⇒ All libraries must use uniform standards and provide the data to national agency in a uniform format viz. MARC-21 format. Irrespective of the software being used for different activities libraries must ensure the data compatible with the MARC-21 standards for data exchange and also provide access to such collection.
- ⇒ In order to take care of the multilingual collections, the study suggests that solution equivalent to UNICODE is needed. And this is very essential in the Indian context.
- ⇒ College libraries have been influenced by several factors for computerization, the study suggests that there should be continuous support from higher authorities of the college as well as support from national and global agencies.
- ⇒ Library must exploit the possibility of introducing more and more new services, educating the users in the use of such service as a prime responsibility.
- ⇒ College must allocate certain amount of budget every year towards the updating and maintenance of infrastructure facilities.

- ⇒ The manpower working at college need proper orientation from time to time to get accustomed to latest developments in technology.
- ⇒ Due to exponential growth in the development of electronic publications, the libraries now have to make best use of available resources in electronic form to satisfy the requirements of the users and also educate the users in the use electronic resources.
- ⇒ Library professionals should learn to be self-dependent and must completely depend on computer science departments; they must learn how to tackle the technical difficulties to the extent possible. This reminds the old Chinese adage *“IF YOU GIVE A MAN A FISH, HE WILL HAVE A SINGLE MEAL IF YOU TEACH HIM HOW TO FISH, AND HE WILL EAT LIFE LONG”*.

7.5 **Suggestions for Further Research**

The present study is restricted to the study of effective use of ICT in College Libraries in Mizoram which happens to be a pioneer study in the area. The scholar has put forth the lively situations prevailing among the college libraries in the state. Developments in the information and communication technologies resulted in easy access to information through the information superhighway. The research and academic users get access to latest available tools resulting in the continuous research and development. Hence there is tremendous increase in the growth of literature in all areas. The College as a Centre of learning must support the academic users by feeding latest information by properly using the IT tools for better access to resources.

With the development in the electronic publishing, there is a need to study the proper mechanism for cooperative acquisition of electronic resources by libraries. A detailed study is essential to understand the pre-requisites for providing easy access to scholarly literature with consortia based

solutions for e-subscriptions including the pricing model for consortia based services for the academic libraries.

More research may be necessary on the information seeking behaviour of the College faculty and students to understand additional requirements not covered under the integrated College library and information system.

Further research is required to develop integrated College library system based on the pre-requisites identified in this study and makes it available to College libraries in Mizoram for providing one point solution. There are some efforts done elsewhere, but there is no major effort to make a comprehensive solution to take care of the system studied in this research work.

7.6 Conclusion

In the new millennium the university library position is to advance as a leader among colleges in using IT and library services in providing enriched learning environment. College library must make information technology and library services a pervasive and transparent part of the lives of users. Information resources are pervasive, when they are available as a matter of course to everyone. The resources are transparent when information applications and services are available without delays or limitation imposed by hardware, software, technical support or physical location. Users must experience information resources as seamlessly integrated into their activities.

The global computer network providing access to online bibliographic information and full text delivery of requests will change the way work is performed in the libraries. The most important advantage of the information age for libraries may be that the information is not limited to the world through the World Wide Web. The College library sector in India has to develop an information technology infrastructure and create an Integrated College Library and information System to improve the quality

of collection and information services in the College library. A local area network and wide area network is a part of this integrated system and linked to regional, national and International networks to provide efficient access to resources.

College libraries must provide reliable, cost efficient access to information whether print or multimedia and whether held locally or remotely. The need to provide information services that remove the barriers of distance and time become even more important. In earlier times libraries have always acquired and organized material so that the information is accessible more easily.

Libraries are an integral part of the academic mission of a College. Libraries can enhance College's reputation by providing access to World class information resources and services and can stimulate research by promoting collections and services widely.

Libraries in India are at some stage of development and the concept of one system one library will bring radical change in the way the information is generated, stored, communicated with the use of Integrated College library and information system.

Librarians in India can no longer be silent spectators of IT revolution. Libraries in the industrial and academic environment as well as public libraries in the USA, UK, Japan and other developed countries are making full use of the information technology tools. We, in India, must change with the times and learn from latest trends adopting sophisticated technology in libraries and information centers in order to keep pace with advanced countries.

Modern technology has given an excellent opportunity for library professionals to manage themselves better. Therefore, all librarians should be perfectly familiar with the benefits of modern technology and perform efficiently. The automation and subsequently library networking is

technologically desirable and economically feasible, in the long run, in modern libraries to provide accurate and instant information through resource sharing in optimum way.

Libraries and library networks are making efforts to get over the impediments they are facing. However, while they may be able to solve some of the problems through cooperative efforts among themselves, they would need the help of supporting or funding agencies to solve many other problems, particularly those related to standardization and quality control. For instance, trained manpower is not available for the data conversion job and to develop databases. Also, none of the College departments provide adequate training in this activity. This situation therefore necessitates engaging raw library and information science post-graduates, providing training to them and then using them for the job. The libraries should however not recruit personnel on regular appointment for the creation of databases covering their back collections (retrospective conversion) as the recruits would not have adequate work once they finish. They should prefer to engage external services on contract basis for this job to clear the backlog and the regular library staff should take care of the updating of the databases on a regular basis. Using contract service has the risk of poor quality input, but it could be overcome by enforcing strict quality control measures. But again majority of the libraries do not have funds for creating the databases.

The scholar has submitted the following possible solutions to these emerging problems.

- The library networks should first compile detailed rules and procedures which should be in tune with existing standards for the databases developments as well as network operation and then ensure their proper implementation by the participating libraries.
- Usually many common publications exist in the acquisitions of different libraries. The individual libraries must therefore check,

before filling an input sheet, with the network office/database to see if that title has already been included in the database and if so, download the entry instead of doing it all over again. If such checking is done among the networks themselves, there would be considerable savings in human efforts and expenditure.

- The government and the funding agencies must provide financial support for database creation in libraries and library networks, as the expenditure incurred on this will pay back in terms of rationalization of library acquisitions, resource sharing and increased use of information. It may be possible to have allocation of funds for this purpose in the annual and five year plans of the Government, if the matter is taken up by the library and networks through proper channels.
- As an incentive to large libraries for sharing their resources with small libraries, a system of credits and debits may be introduced. That is, a library would get a credit point by lending a document and a debit point by borrowing a document. These points may be settled in monetary or other acceptable terms at regular intervals.
- The Network managements must organize practical based training programmes as frequently as necessary to train the staff of the participating libraries. It would be good if teachers in library science schools are also trained along with practicing library professionals so that these teachers would, in turn, train their students year after year.
- The network management must also provide common software on a cost-to-cost basis for use in libraries on request. It would be worthwhile to get such software developed, if it is not already available. For such software, through back-up technical support must be ensured either directly by the networks or through some contract arrangement.

- The database development contractor must be encouraged to come up in large numbers to create databases on contract including retrospective conversion. This would speed up the time consuming task of data conversion. Since a large number of libraries and information centers intend to create databases, it will be lucrative business for these contractors for a number of years.

Development and management of library networks involve high commitment and tenacious work, particularly in the Indian environment where majority of the libraries do not have qualified and skilled manpower and also the financial resources to introduce automation and the current information technologies. Co-operation, not only among libraries, but also among library networks is essential for the success of these networks in the country. While the problems and suggested solutions mentioned earlier are only indicative, the network managements have to make considerable efforts for detailed planning, implementation and successful operation of networks. These efforts call for full time work; part-time efforts may not only affect the quality, but also delay the implementation of the networks.

Libraries in India are passing through a very crucial period. Except for the four states in the South, Maharashtra, West Bengal and Metropolitan areas which at least have the basic structure, in the rest of the states and UTs the growth is haphazard with no significant and planned development. In the computer age, the important thing to do is computerization of libraries, especially academic and special libraries, for effective and efficient services. Out of 29 States and 6 Union Territories only 10 have enacted public library legislation. This is the state of affairs even after more than 60 years of Independence. Library Networks are mainly concentrated in Metropolitan areas, e.g. DELNET, CALIBNET, ADINET, PUNENET, BONET, MALIBNET, etc. In Rest of India, libraries/information centers need to be well equipped with modern technology and all should be

connected through networks. It is for the library associations to come together and discuss at length the present state of affairs and work out a plan for the betterment of existing services and extension of the same by a system of resource sharing through a network of libraries and information centers.

From the above considerations, it can be said that tomorrow's automated network libraries will cost more than today's automated libraries, but still less than the future cost of single traditional libraries. Initially, a library network needs resources to sustain, but on long run, benefits accrued by the networking will surpass the loss of revenue.

In conclusion, it may be stated that the level of library automation has reached its growing-up stage in India. Though, there has been an upsurge in the usage of information and communication technology in college libraries in the recent past the present study shows that the performance level of the library automated systems in college libraries is not very satisfactory. This situation calls for a serious attention from the library authorities and professionals in India including the interference of the management authorities and the top brass of the Government of Mizoram to work out ways and means of improving the situation. Only well planned concrete and coordinated efforts could lead to a satisfactory solution to the problem.

To sum up, it is necessary to point out the fact that college libraries in Mizoram though well prepared for automation with regard to its infrastructure and technical aspects, are still unable to implement Integrated Library System in a consistent and uniform way across the functions and services in full length. But it is also worth noting that integrated library systems do not exclusively represent the use of information technology in libraries. It also includes other electronic media resources, acquisition policy and processing of holding on a co-operative basis, inter-library lending systems, document supply systems and gateway to electronic resources.

ANNEXURE-I

Adoption of Information and Communication Technologies in the College Libraries of Mizoram: A survey

QUESTIONNAIRE

1. Name of College:.....
 Year of Establishment:.....
 Affiliation to University:.....
 Category of College:.....

2. College Library:
 Total No. of Collections:
 Books:..... Journals:.....
 Budget Allocation:.....

3. Human Resources (Library Staff)
 - (a) Professional Staff:
 - (b) Semi Professional Staff:.....
 - (c) Non Professional Staff:.....

4. College Library Automation and Networking:
 - (a) Availability of Present Infrastructure in the Library
 - (i) Hardware (Computer).....
 - (ii) Library Software Used:.....

(b) OPAC Services:.....

(c) Other House Keeping Operations:.....

(d) Automated Library and Information Services Provided:.....

5. Networking:

Where Library is connected to any Library and Information Networks in the Country?

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6. Digitization:

Have you initiated Proposal for Library Website and Digitization?

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7. Problems Faced in this Regard:

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8. Suggestions for Improvement with Regard to Automation and Networking:

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ANNEXURE-II

Name of the Colleges in Mizoram

Constituent College

1. Pachhunga University College

(A Constituent College of Mizoram University)

Govt. Colleges

1. Govt. Aizawl College, Aizawl
2. Govt. Aizawl North College, Aizawl
3. Govt. Aizawl West College, Aizawl
4. Govt. Champhai College, Champhai
5. Govt. Hnahthial College, Hnahthial
6. Govt. Hrangbana College, Aizawl
7. Govt. J. Buana College, Lunglei
8. Govt. J. Thankima College, Aizawl
9. Govt. Johnson College, Aizawl
10. Govt. Khawzawl College, Khawzawl
11. Govt. Kolasib College
12. Govt. Lawngtlai, Lawngtlai
13. Govt. Lunglei College, Lunglei
14. Govt. Mamit College, Mamit
15. Govt. Saiha College, Saiha
16. Govt. Saitual College
17. Govt. Serchhip College, Serchhip
18. Govt. T. Romana College, Aizawl
19. Govt. Zawlnuam College, Zawlnuam
20. Govt. Zirtiri Residential Science College, Aizawl

Private Colleges

1. Bualpui NG, Bualpui
2. C. Zakhuma College
3. Kamalanagar, Chawngte
4. Mizoram Law College.
5. N.E. Khawdungsei, Khawdungsei
6. Southern College, Lunglei.

ANNEXURE-III**Name of the Colleges in Mizoram visited by Research Scholar
on site****Constituent College**

1. Pachhunga University College

(A Constituent College of Mizoram University)

Govt. Colleges

1. Govt. Aizawl College, Aizawl
2. Govt. Aizawl North College, Aizawl
3. Govt. Aizawl West College, Aizawl
4. Govt. Hnahthial College, Hnahthial
5. Govt. Hrangbana College, Aizawl
6. Govt. J. Buana College, Lunglei
7. Govt. J. Thankima College, Aizawl
8. Govt. Khawzawl College, Khawzawl
9. Govt. Kolasib College
10. Govt. Lawngtlai, Lawngtlai
11. Govt. Lunglei College, Lunglei
12. Govt. Saiha College, Saiha
13. Govt. Saitual College
14. Govt. Serchhip College, Serchhip
15. Govt. T. Romana College, Aizawl
16. Govt. Zawlnuam College, Zawlnuam
17. Govt. Zirtiri Residential Science College, Aizawl

Private Colleges

1. C. Zakhuma College
2. Kamalanagar, Chawngte
3. Mizoram Law College.
4. Southern College, Lunglei.

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