

**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 13<sup>th</sup> 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 20<sup>th</sup> century, the Library of Congress started co-operative cataloguing projects and began working on the National Union Catalogue. Thereafter, in the 20<sup>th</sup> 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. 4<sup>th</sup> 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 20<sup>th</sup> 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 20<sup>th</sup> 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 vase 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

<b>Work</b>	<b>Technology (Form Old to New)</b>	
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 files/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**

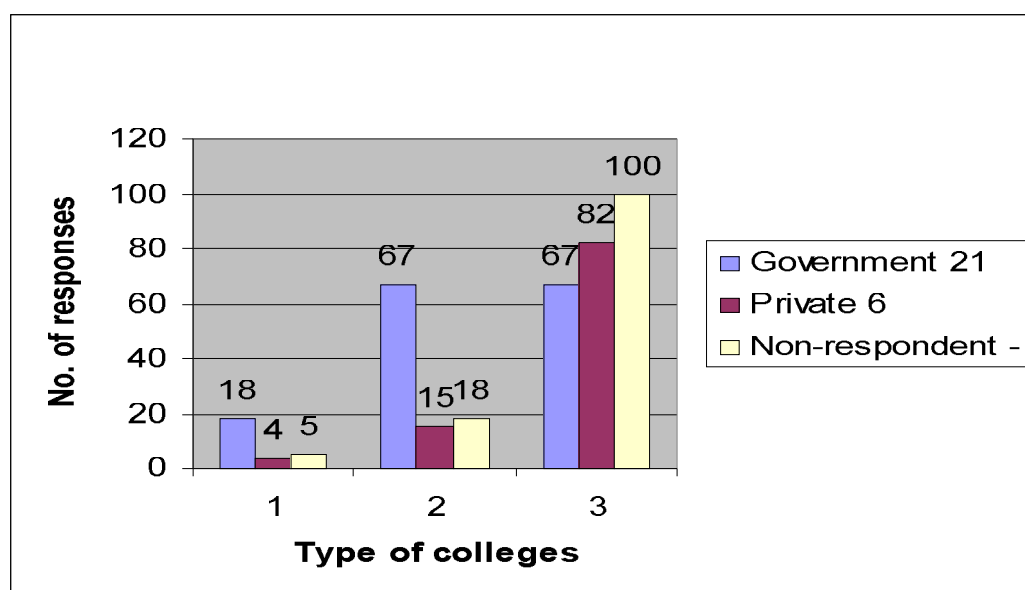
### **6.2 Analysis by number of responses**

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

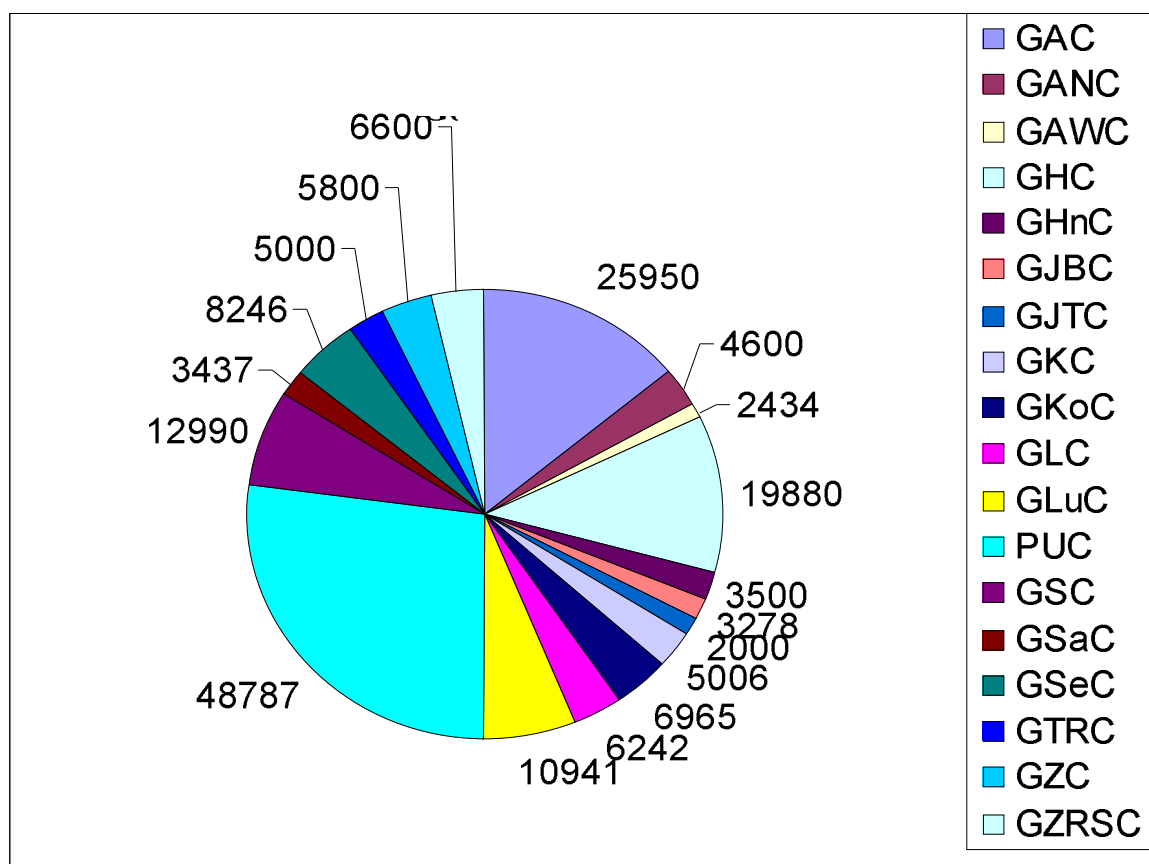
one of the components in the questionnaire which were served to the college libraries under study in Mizoram to find out the information pertaining to the collection development of the respective college. Information regarding to collection development in regards to books and journals of all the 27 colleges 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**

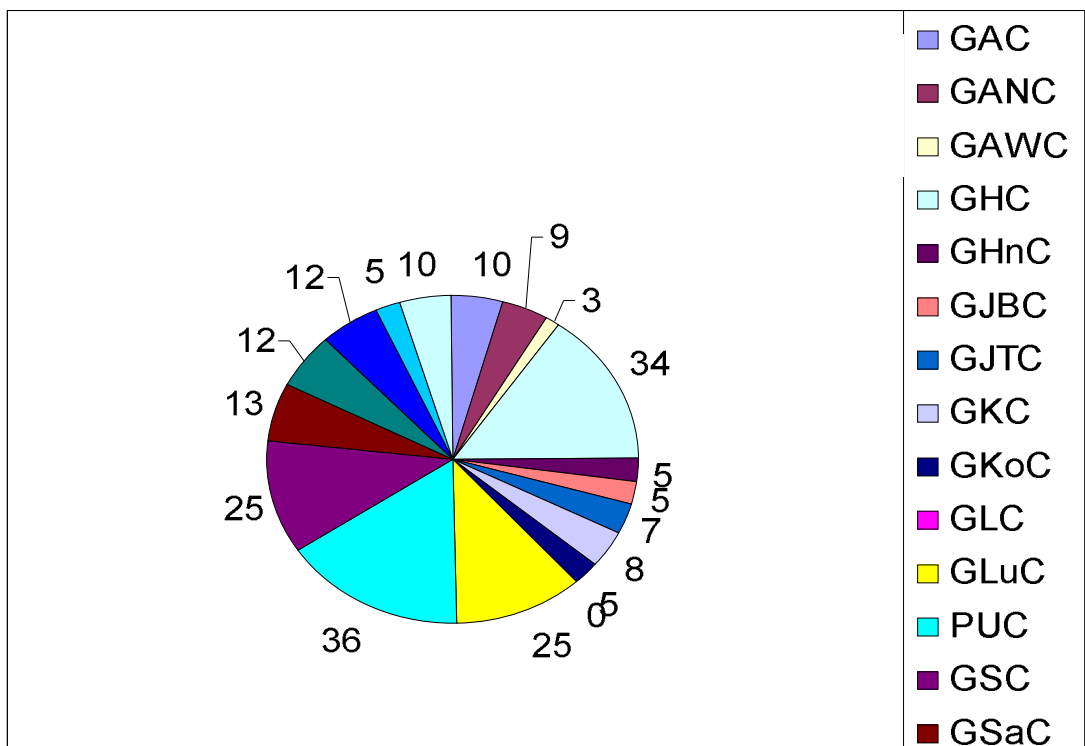
Sl.No	Description of the college	Total No. of books	Total No. of Journals
<b>Government College</b>			
1.	GAC	25950	10
2.	GANC	4600	09
3.	GAWC	2434	03
4.	GHC	19880	34
5.	GHnC	3500	05
6.	GJBC	3278	05
7.	GJTC	2000	07
8.	GKC	5006	08
9.	GKoC	6965	05
10.	GLC	6242	00
11.	GLuC	10941	25
12.	PUC	48787	36
13.	GSC	12990	25
14.	GSaC	3437	13

15.	GSeC	8246	12
16.	GTRC	5000	12
17.	GZC	5800	05
18.	GZRSC	6600	10
<b>Private College</b>			
19.	CZC	753	05
20.	KC	500	04
21.	MLC	5437	06
22.	SC	300	05

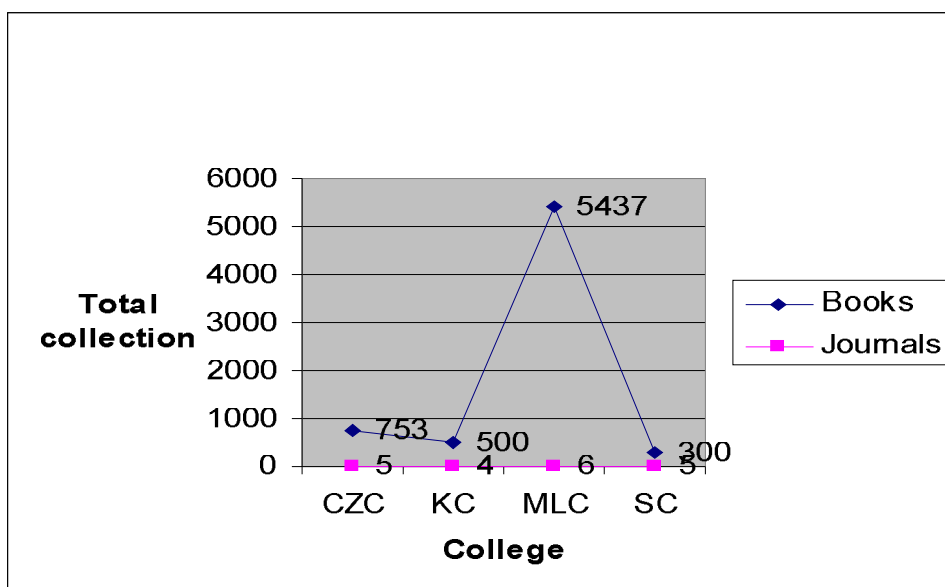
**Graph – 2 (A): Collection Development of Govt. College Libraries**



**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'

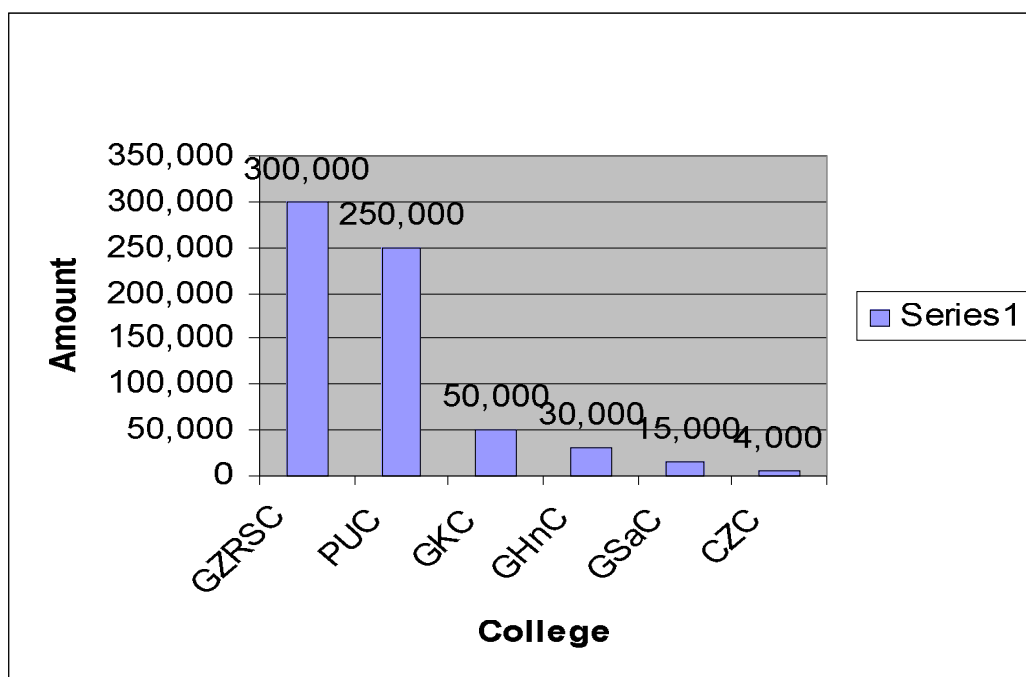
communities. It also helps the librarian to strengthen the library with a sound collection development including other associates services.

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.
<b>Government College</b>		
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

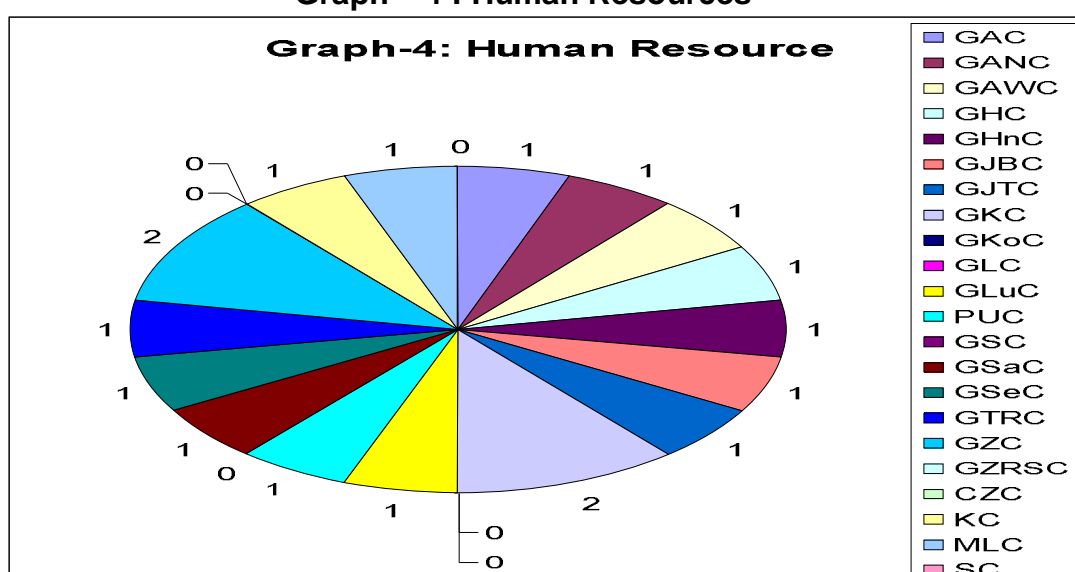
Human Resource especially with technical qualification is the real backbone of any library system. Manpower is imminent in view of completing the multifarious works in the library which includes, circulation, cataloguing, classification etc. including data inputs in computer, searching of information 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

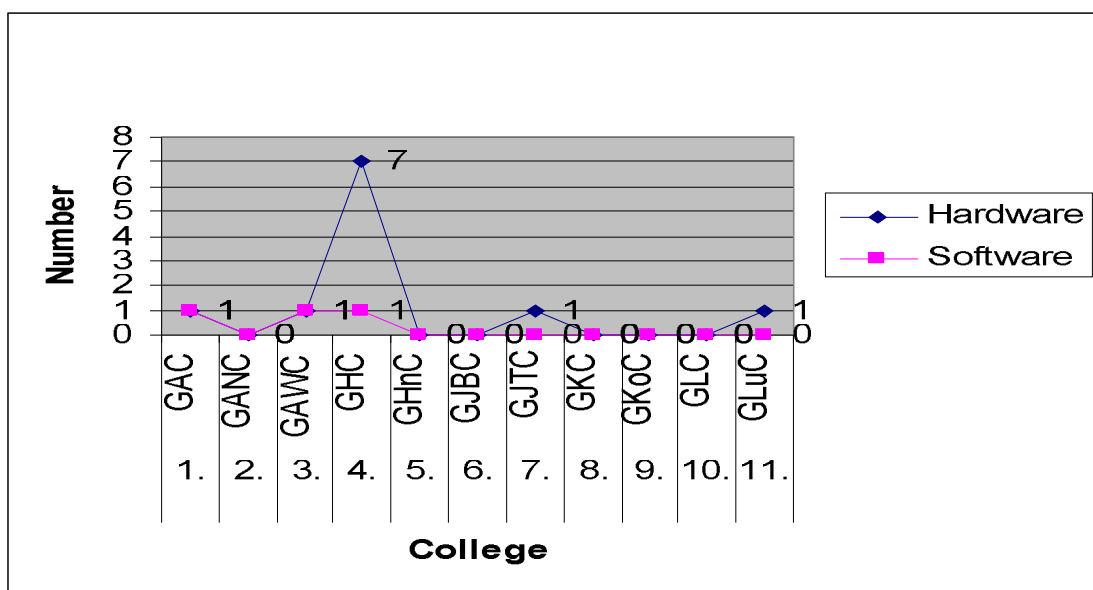
information. The data, however, reflects only to the Hardware and Software being used in the respective college libraries as no other areas such as OPAC services or House Keeping Operations were being introduced in the college libraries.

**Table-12: Library Automation and Networking**

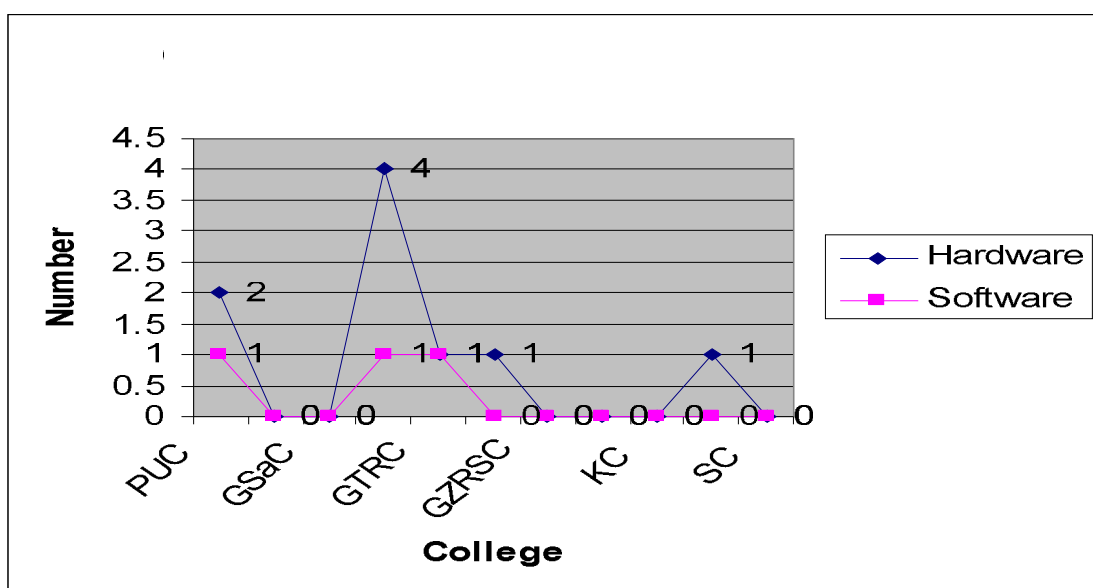
Sl.No	Name of the college	Hardware	Software
1.	GAC	01	01
2.	GANC	00	00
3.	GAWC	01	01
4.	GHC	07	01
5.	GHnC	00	00
6.	GJBC	00	00
7.	GJTC	01	00
8.	GKC	00	00
9.	GKoC	00	00
10.	GLC	00	00
11.	GLuC	01	00
12.	PUC	02	01
13.	GSC	00	00
14.	GSaC	00	00
15.	GSeC	04	01
16.	GTRC	01	01
17.	GZC	01	00
18.	GZRSC	00	00
19.	CZC	00	00

20.	KC	00	00
21.	MLC	01	00
22.	SC	00	00

Graph – 5 (A) : Hardware &amp; Software



Graph – 5 (B) : Hardware &amp; 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](http://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 need 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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