Application Of Information And Communication Techology In Special Libraries In Aizawl: A Study

A Dissertation submitted to The Mizoram University in partial fulfillment of the requirement for the Degree Of

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by
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2013

DECLARATION

I hereby declare that dissertation entitled **"Application Of Information and Communication Technology in Special Libraries in Aizawl: A Study"** submitted by me has not previously formed the basis for the award of any Degree or Diploma or other similar title of this or any other University or Examining body.

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CERTIFICATE

This is to certify that the dissertation entitled **"Application of Information and Communication Technology in Special Libraries in Aizawl: A Study"** submitted by **R. Lalrohlui** for the award of the Degree of Master of Philosophy in Library & Information Science is carried out under my guidance and incorporates the student's bona fide research. This is the candidate's original work and is worthy of examination.

Date:
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Dated: **(R. LALROHLUI)**

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ABBREVIATIONS

AACR- Anglo-American Cataloguing Rules

ACP - Accelerated Graphics Port

ALU - Arithmetic Logic Unit

AICS - Academy of Integrated Christian Study

AICTE- All India Council for Technical Education

AIR - All India Radio

ATA - Advanced Technology Attachment

ATC - Aizawl Theological College

ATI - Administrative Training Institute

ATLA- American Theological Library Association

BVSc & AH - Bachelor of Veterinary Science & Animal Husbandry

CAS - Current Awareness Service

CCTV- Closed-circuit television

CD - Compact Disc

CD/ROM- Compact Disc-Read Only Memory

CDS/ISIS- Computerized Documentation Service / Integrated Set of Information Systems

DARPA- Department of Defense Advanced Research Projects Agency

DBMS- Database Management System

DDC - Dewey Decimal Classification

DDK - Doordershan Kendra

DDS - Document Delivery Service

DIET - District Institute of Education and Training

DSL - Digital Subscriber Line

DVD - Digital Versatile Disc

EISA - Extended Industry Standard Architecture

FDDI - Fiber Distributed Data Interface

FTP - File Transfer Protocol

GB - Gigabytes

HTML- Hypertext Markup Language

HTTP- Hypertext Transfer Protocol

ICFAI- Institute of Chartered Financial Analysts of India

ICT - Information and Communication Technology

ID - IDentification

IIT - Indian Institutes of Technology

INDEST- Indian National Digital Library in Engineering Sciences and Technology

IP - Internet Protocol

ISA - Industry Standard Architecture

ISBD - International Standard Bibliographic Description

IT - Information Technology

KW - Medium Wave

LAN - Local Area Network

LGBRIMH- Lokopriya Gopinath Bordoloi Regional Institute of Mental Health

LCD - Liquid-Crystal Display

Libsys- Library system Software

LIS - Library and Information Science

MAN - Metropolitan Area Network

MARC - MAchine-Readable Cataloging

MBBS - Medicinae Baccalaureus, Bachelor of Surgery

MCON- Mizoram College of Nursing

MP - Madhya Pradesh

MW - Mega Watt

NASA - National Aeronautics and Space Administration

NIELIT- National Institute of Electronics and Information Technology

NIRMALS- Network Information Resources Management of Academic Library System

NIT - National Institute of Technology

NSF - National Science Foundation

OPAC- Open Access Catalogue

PC - Personal Computer

PCI - Peripheral Component Interconnect

RAID - Redundant Array of Independent Disks

RAM - Random Access Memory

RF - Radio Frequency

RFID - Radio Frequency IDentification

RIPANS- Regional Institute of Paramedical and Nursing Science

RLIN - Research Libraries Information Network

ROM - Read Only Memory

SATA - Serial Advanced Technology Attachment

SCSI - Small Computer System Interface

SCERT- State Council of Educational Research & Training Wing

SMDS- Switched Multimegabit Data Service

SOUL - Software for University Libraries

TCP/IP- Transmission Control Protocol/Internet Protocol

TLSS - Total Library Software Systems

TV - Television

UGC - University Grant Commission

UNESCO- United Nations Educational, Scientific and Cultural Organization

UNICEF- United Nations International Children's Emergency Fund

UPS - Uninterrupted Power Supply

URL - Uniform Resource Locator

USB - Universal Serial Bus

VCD - Video Compact Disc Digital

VIP - Very Important Person

VVIP - Very Very Important Person

WAIS- Wide Area Information Servers

WAN - Wide Area Network

WLN - Washington Library Network

WWW- World Wide Web

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1.1 Introduction

In today environment relevant information is very essential to the development of society and library, the relevant information is also required to keep and prevent very well. Libraries are recognized as custodians of books, information and knowledge. The researcher, teachers, students, administrator, industrial & business manager, artisan, farmers etc. are needed an information to equip themselves better for the fruitful pursuit of their respective vacations. They are depending on library to get their information. Now we are living in Information society where ICT has change the way and dimension of information & its flow. Rapid advances in information and communication technology (ICT) have brought revolutionary changes in library operations and Librarianship. These changes transformed that the role of library professionals from custodian of library books to information solution providers and knowledge manager. The success of ICT implementation depends largely on availability of competent library professionals because library professionals are the key to successful use of any new technology in a library. The ICT has tremendous impact on Librarianship and library user's expectations. The society is becoming more complex and dependent on Science and Technology, the need for timely organization, communication and dissemination of information in increasing day by day. Information is being recognized as an important resource of accelerating to national development. We are in the age of fast technological changes along with information explosion. There has been a growing interest and concern over modernization of library operations and services in India since 1980s. Due to information explosion, automation of library services is imperative for efficiency and effective working of library systems. The expediency of automation and application of ICT is doing by library scientists not only due to copious flow of information and reading materials but also for apparent economic considerations and viability. Hence, efficaciousness and economy of library systems both become more meaningful as a result of ICT application in Library

Dr. APJ Abdul Kalam, Ex-President of India have expressed his opinion on the value and power of knowledge during address to the Nation on Republic day in 2003 as – "Our society is emerging as knowledge society and efficient utilization of his existing knowledge can create comprehensive wealth of nation and also improve the quality of life whether a nation has arrived at the state of knowledge society is judged by the way the country effectively deals with knowledge creation & development in all sectors like IT, industries, agriculture, health care etc".

A Library system based on ICTs will undoubtedly reallocate tasks between libraries professional and beginning it poses new uncertainties. The foundation of librarian's work lays in pursuit of this duty in accordance with the known expectations of society in general and the needs of the users of his library in particular. In the present ICT era, library services have changed in all aspect and we can saw the direct impact of ICT on the library services. Now librarians are also realized its role in libraries and they try to coop with these ICT based technology and they are transferring the traditional library services into modern ICT based services because technology

provides many options & possibilities to enhanced, convenient, value-added and on-demand library services.

In the era of ICTs the libraries have changed in their shape, size, structure and most important in their services. Recently endeavors are being made to establish digital/electronic library in all over the world. By apply recent emerging ICTs and many virtual libraries have been established to facilitate the users to access the knowledge on a mouse click. Therefore, the foundation of librarian works lies in pursuit of his duties in accordance with the known society in general and needs of users in particulars. Now libraries and librarians by their interventions direct the speed and direction of the society and the condensational role does not apply any more. Therefore library professionals have to learn new area of ICTs, intellectual property right and new subject areas to sustain their identity because now their role is not only information providers but they are a catalyst for development.

We are experience the impact of new technology in very facet of information handling. The advent of ICT has opened up the possibilities in information management and it is likely to change the information infrastructure by merging itself with other related technologies. The increasing use of computer systems for the control of management of information has important implications for our thinking about information and this information processing, storage and dissemination with the aid of computer is called Information Technology.

In today environment, Information Communication Technology (ICT) is becoming an indispensable in every organization because it brings about changes in every organization's mode of services. Hence, it plays a vital role in our daily life also and we cannot run out from it. The traditional tools of ICT include TV, radio and telephone whereas modern ICT tools are computer, internet and wireless communication technology, web sites, web tools (blogs, wiki, social networking sites, etc.). It facilitates all our communication systems and we can say that all these technologies have been the driver of knowledge society. It is basically information handling tools which is a set of production, application and services that are used to produce, store, retrieve, deliver, process, organize, distribute, preserve, search, exchange and update of an information.

The widespread use of ICT facilities increased better application of computer network, rapid growth of Internet and it causes great explosion of information quantitatively and qualitatively that forced library to adopt new method of storing, retrieving, preserving, conserving and disseminating of information. According to the American Library Association (1993), the ICT facilities use in the library is "the application of computers and other technology to the acquisition, organization, storage, retrieval and dissemination of information". In the fully-automated-library there are two types of operation works; Library House-keeping Operations and Library Information Handling Operations which are performed with the help of computers. To complete that works, Network Operating System (e.g. Linux, UNIX, Windows NT, Windows XP etc.) and Library Management Software **(**e.g. TLSS, Libsys, SOUL, CDS/ISIS etc.) were used.

All these technologies changed the process of the library systems, it facilitate the communication systems in a library which emphasizes user satisfaction, rapid responses, cost effectiveness, better administration and high quality library operation. Without application of ICT facilities in a large library is like an example of 'working without hand'.

1.2 Special Library

Nowadays, education is very important and is requisites for possessing knowledge. The proliferation of information in modern world causes the needs of a dependable information centre to preserve and provide reliable information to the educator. Therefore, one of the most important tools for the spread of education is information centre/library. A library (from French "librairie"; Latin "liber" = book) is an organized collection of information resources made accessible to a defined community for reference or borrowing. It provides physical or digital access to material, and may be a physical building or room, or a virtual space, or both. A library's collection can include books, periodicals, newspapers, manuscripts, films, maps, prints, documents, microform, CDs, cassettes, video tapes, DVDs, Blu-ray Discs, e-books, audio-books, databases and other formats. Libraries range in sizes from a few shelves of books to several million items (Wikipedia, 2013).

There are three types of library which are Public Library, Academic Library, and Special Library. They all are equally important along their stream. Among them, the Special Library is one of the most important because our modern society needs more specialized instruction in various fields to promote and develop their culture. Special Library is developed for the advancement of the literature of special instruction in any fields oneself. As the above definition we already know that the real meaning of library and then the word 'special' is derived from Anglo-French 'especial' which means 'individual, particular'. The word special is firstly known used in the 13th Century. The Merriam-Webster.Com defined special as "distinguished by some unusual quality..., being other than the usual or designed for a particular purpose or occasion..." Therefore, Special Libraries are 'special' in their collection, users, services and they provide pinpointed, exhaustive and expeditious services to their users.

According to International Organization for Standardization Special libraries are, "those maintained by an association, government, parliament, research institution, museum, business firm, industrial enterprise, chamber of commerce, etc, or other organized group, greater part of their collection being in a specific field or subject, e.g. natural sciences, social sciences, agriculture, chemistry, medicine, economics, engineering, law and history".

According to UNESCO "These libraries may be attached to various bodies, such as parliament or a government department, a scientific or other research institution, a learned society, professional association, museum, industrial association, chamber of commerce, etc. and not coming within any of the categories-national libraries, university libraries and school libraries".

1.3 Information and Communication Technology (ICT)

The post industrial period has brought considerable advances and innovations in technology. As a result of this many new interdisciplinary field have emerged Information communication Technology (ICT) is one of them. It is a advance stage of Information technology. ICT is a recent and comprehensive term, which describes the whole range of process of acquisition, storage, transmission, retrieval, and processing of vocal pictorial, textual and numeric information. Such process is mechanical in nature. The ICT is the science of information handling particularly by computers, used to support the communication of knowledge in technical, economic and social fields.

The development of telecommunication technology is in the sense, a symbol of man's effort of communicate rapidly over great distance. The computer lies at the heart of modern communication systems and communication technologies, which is found very useful for message transmission. The speed and capacity of data transmission are such that vast amount of data are capable of being transmitted across the world in second. The development of Computer network allows for collection, collation, integration and dissemination of information on an unprecedented scale. This new technology (i.e. ICT) has probable and important uses in the home, office, factory, community and in information exchange system.

According to the New Shorter Oxford English Dictionary, information is "the result of processing, gathering, manipulating and organizing data in a way that adds to the knowledge of the receiver". Encyclopedia Britannica defines communication as "interest in communication has been stimulated by advances in science and technology, which, by their nature, have called attention to humans as communicating creatures". Information Technology is according to Compact Oxford Reference Dictionary, "an extensive electronic network such as computers and telecommunications for storing, retrieving, and sending information".

Information and Communications Technology or (ICT), is often used as an extended synonym for information technology (IT), but is a more specific term that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers as well as necessary enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information (wikipedia, 2013).

A broad definition of Information and Communication Technologies (ICTs) ranges from traditional technologies such as the printed word, to the most modern communications and data delivery systems such as terrestrial satellites that can download digital data to a laptop computer hooked up to a cellular network (S. Venkatesh).

ICT refers to technologies that provide access to information through telecommunications. It is similar to Information Technology (IT), but focuses primarily on communication technologies.

This includes the Internet, wireless networks, cell phones, and other communication mediums (techterms.com).

Information and communications technology (ICT) refers to all the technology used to handle telecommunications, broadcast media, intelligent building management systems, audiovisual processing and transmission systems, and network-based control and monitoring functions (techopedia.com).

Some people said that when we are going to define ICT we should also need to define two terms that are Informatics (information science) and Information technology. According to UNESCO (2002), "Informatics as the Science dealing with the design, realization, evaluation, use, and maintenance of information processing systems, including hardware, software, organizational and human aspects, and the industrial, commercial, governmental and political implications of these. Informatics technology is the technological applications (artifacts) of informatics in society. Therefore, ICT is defined as the combination of informatics technology with other related technologies, specifically communication technology".

1.4 ICT Skills for LIS Professional

The implementation of new and advance technologies in the libraries requires competent staffs with different ICT skills. One of the important factors for successful implementation of ICT is the level of competence of the staff working knowledge of ICT skills for library professionals for handling various library functions to make full use of this potential for handling various library functions. To make full use of this potential in library management it is essential that should have adequate professionals who have through knowledge of ICT application in libraries but in practice most of the library professionals do not have adequate skill of ICTs. The knowledge, skill & interest in various aspect of ICT need to be constantly upgraded among the library professionals. The skill is an ability or proficiency in execution or performance, which is required for a person to plan and execute an action designed to achieve some goal or accomplish a particular task. A skill person has the ability to perform any task successfully. The basic goal of library and information profession has always been to provide access to information for those who need it. The activities realizing this goal have evolved and transformed over the years. Information activities have been guided by the developments in the field of information storage, presentation and archiving of knowledge, information explosion and computers in information retrieval and dissemination on one hand and on the other hand the computer specialist who support the LIS professionals are partners in this endeavor. For successful implementation of ICT tool and services in library, It is essential that LIS professionals are well trained and possess, requisite knowledge and technical skills in this respect.

The technical skills means those skills which are required to handle ICT based tolls and routines used for library services like computer operation, knowledge of software, telecommunication media, creation of online databases and content management software, information retrieval

techniques through internet etc. Digital library is nothing but advance application of ICT based tools and techniques in the library. Hence LIS professionals have to familiar with the relevant skills to handle ICT and its application in the present digital environment. Some basic ICT skills which required by LIS professionals to apply these ICT technologies in their libraries are:

- Basics of ICTs
- Networking
- Data Base Management
- Web development
- Management of multiple media
- Metadata skills
- Knowledge of standards such as MARC-21, ISBD, Z39.50, Dublin Core etc.

Library professional should updating themselves at regular intervals via attending at seminar, workshop, training, short term, symposium and conference etc. to handle modern ICT technology. They are acquire to know how create linking data, how to do content management, retrieving, sharing and preserving digital information. Due to the fast changing technological developments continuous in service training for working librarian is essential not only to keep them well informed about the latest development in their fields but also to learn new skill in the use of modern technology.

1.5 Impact of ICT on Library staff Attitude

The library staff attitudes play a vital role for the success of library services in automated environment. Positive attitude and action of staff involved in ICT uses are regarded as crucial inputs for the successful implementation. As per the attitude of library staffs' towards automating library, majority of the staff member are open minded, reasonable and enthusiastic showing genuine interest in learning more and to be included in training & orientation. According to Luquire (1983), "To deal with new technology and maintain balance between human considerations & technology and maintain balance between human consideration and the technology of library automation, better understanding of the complexities of the perceptions and attitudes of people is mandatory.

Klerk and Euster (1989) found that the technical services staff accustomed to the detail and specified required by a computer are adopting easily. Prince and Burton (1998) found that senior academic related staffs was largely unbiased in technology while more recently qualified staff being more positive adopter of innovation.

Jones (1999) conducted a survey on 218 support staff perceptions and opinions about technological changes in three university libraries and received response from 118 respondents (54%). Most have now experienced a high tech work environment. Regarding personal reactions to working with new technologies, out of 118 respondents, 39 respondents checked positive terms (excitement, enjoyment, pleasure, and competency), 22 checked negative terms (frustration, inadequacy, dislike, irritation. Tolerance) while 57 checked a mixture of positive and negatives terms.

1.6 ICT and LIS Education

LIs education has played a very significant role in the growth of information society through its planned effort to incorporate. The LIS education in India has a unique profile as it started as a voluntary vacation by many university libraries Today library education is not more an education for the managers of libraries only but has become an education for consumer of knowledge also. It has change from managing library by librarians to manage the flow of information by one and all and it reached a stage where it is considered as a course to be reckoned with technologically affluent programs and being considered on the agenda of apex bodies offering technical education. It is influenced by ICT component.

LIS education and ICT are indispensable now a day because LIS School put a lot of thing related to ICT in their course. Now, every syllabus of library science included ICT components at each and every semester. The new LIS professionals are very well equipped with ICT tool because they are studding so many ICT thing as a part of their course computer with hardware & software, binary numbers, operating systems, programming language, application software, internet, Web, internet protocols, Web design, URL, Web browser, search engine, e-mail, open source software, digitization, library automation, OPAC, CD-ROM, DVD, telecommunication (data transmission, wireless communication, satellite, radio signal, spectrum, bandwidth, modem, optical fiber, hub etc.), FTP, e-books/journal, e-publishing, databases, networks, consortia, Knowledge mapping, Knowledge society, information society etc.

Thus, The ICT has profound impact on the role of library professionals and offers numerous opportunities for professional and personal carrier development. Library professionals with good ICT skills and expertise will have ample opportunities in profession now. It has become increasingly important for library professionals to acquire and enhance their ICT skill in order to implement new technology in libraries to provide new ICT based library services to users.

1.7 Significance and Scope of the Study

Information and knowledge have become increasingly important in this globalized world; every country, state as well as city necessitate rich collection of information due to highly demand of information that causes need of sufficient information center or library to prevent, protect and provide good collections at an accelerated speed in times of the users need. All types of special libraries were very important because they were promoted to develop our culture, society and our country, and hence they were the real face of our country. The essential purpose of special library is to provide information which will assist its parent organization. When using ICT facilities in a library (that means automated library), it involves working of house-keeping operations *(i.e. acquisition, classification, cataloguing, circulation, stock-taking, serial control)* and information handling operations *(i.e. Information Retrieval, Indexing, Abstracting, Networking, Resource Sharing, Current Awareness Service, Selective Dissemination of Information)* that practices high quality library operations and services to make users satisfaction

because when there is no application of ICT in a library there can be no successful satisfaction of users.

The scope of the present study is limited to Special Libraries in Aizawl with emphasis on the application of Information and Communication Technology in the Library. There are Sixteen Special libraries in Aizawl namely- Assembly Secretariat Library; Doordarshan Kendra Library; All India Radio (AIR) Library; National Institute of Technology (NIT); Presbyterian Hospital Library; Mizoram College Of Nursing (MCON) Library; Regional Institute of Paramedical and Nursing (RIPAN) Library; College of Veterinary Science and Animal husbandry Central Agriculture University Library; Agriculture Farmer's Department Library; State Council of Educational Research and Training (SCERT) Library; Aizawl Theological College (ATC) Library; Academy of Integrated Christian Study (AICS) Library; Administrative Training Institute (ATI) Library; National Institute of Electronics and Information Technology (NIELIT) Library; District Institute of Education and Training (DIET) Library; Polytechnic Library.

1.8 Review of Literature

- Al-Ansari, Husain. Application of Information and Communication Technologies in Special Libraries in Kuwait. http://dx.doi.org/10.1108/02640471111156731. Accessed on 12-01-2013.

He explored the application of information technology in various operation and services in special libraries in Kuwait. He suggested its implications for the development of special libraries in Kuwait. It also indicates existing obstacles, difficulties, suggestion and recommendations for further development of special libraries in Kuwait.

- Thanuskodi S (2012): Use of Internet by the faculty members of Arts and Science Collage in Cuddalore district, Tamilnadu, India: A case study; International Journals of Information Research; Vo.l 2 No.2 2012. Pp 207-225.

This study examines the use of internet by the faculty members of Arts and Science Collages in Cuddalore described by frequency of internet use, purpose of using the internet, use of different internet services and impact of internet on research/teaching. A questionnaire was prepared and sent to 70 faculty members of the collage. The result indicated that 58.62% of respondents access the internet from collage library and 91.37% respondents indicated that research and teaching is the primary purpose for using Internet.

- Upadhyay, N and Prasad, HN (2012): Has the on-line resources changed the traditional services of IITs library? International Journals of Information Research; Vol. 2 No.1 2012. Pp 61-75.

They studied about electronic collections of IITs libraries have been growing steadily in last two decades and it has changed the library services based on print resources. They highlighted the changes in library services and examine the projections of library administrators towards the impact of online resources on the traditional library services.

- Joshi, Purnima (2012); Online Information Sources in law: An Overview; International Journals of Information Research; Vol. 2 No.1 2012. Pp 98-108.

He has given an overview of the diverse legal literature and provided an annoted bibliography of the various types of legal resources available on the internet. She tried to identify and discuss specific resources that offer added features to enhance their usefulness of Indian students and professionals. Various legal information sources available on the internet have been present, examined and classified according to their content and use. She observed that Internet greatly facilitated legal education and research by offering freely available authentic information resources.

- Al-Ansari, Husain (2011). Application of Information and Communication Technologies in Special Libraries in Kuwait. *The Electronic Library*: 29(4): 457-469.

This study explored the application of information technology in various operation and services in special libraries in Kuwait. The author suggested ICT implications for the development of special libraries in Kuwait. It also indicates existing obstacles, difficulties, suggestion and recommendations for further development of special libraries in Kuwait.

- Kamba, Manir Abdullahi (2011). Implication of ICT's in Libraries of Higher Education Institutes: A Panacea Catapulting Library Development in Africa. *Journal of Library & Information Technology*: 31(1): 65-71.

This study revealed that the Implication of ICT's in Libraries of Higher Education Institutes in Africa and exposed the ICT impact on libraries of higher education. The paper has analyzed the efforts made by the higher education's libraries in Africa to recognize, restructure and re-oriented the library facilities and personnel with ICT adoption. In addition, the paper also highlights the various efforts to establish networking and consortia among the libraries, and the implications that could be derived by applying ICT into higher education's libraries. The paper also highlights the reasons why ICT application is taking a snail speed in library development in Nigeria and provides the solutions as a panacea for library development in Africa.

- Murugesan, N. and Balasubramani, R. (2011). Application of ICT Based Resources and Services in Research and Development Libraries in Tamil Nadu. *European Journal of Social Sciences*: 23(1): 157-164.

This study is conducted to inspect the application of ICT in Library for research and development in Tamil Nadu, India. The study provides recommendations to give priority to digital library initiatives; consortia based subscription to enhance effective and efficient use of ICT in the library for research and development in Tamil Nadu.

- Tiwari, Braj Kishor and Sahoo, K.C. (2011). Infrastructure use of ICT in University Libraries of Madhya Pradesh: Libraries Views. *International Journal of Information Dissemination and technology*: 1(4): 232-240.

The paper studied about the use of ICT Infrastructure in University Libraries of Madhya Pradesh and highlighted the use of ICT has influenced the libraries for its overall betterment. It examines that libraries uses ICT to provide housekeeping operations, user's services, standardization, manage communication facilities and extension of library activities. University libraries of Madhya Pradesh (MP) are in transition stage in the use of ICT. The study is based on librarians' views and attempts to reveal the real scenario of university libraries of MP as regards to its infrastructure, use and problem to develop and maintain the ICT in libraries. Survey method has been used in the study to find out the present ICT infrastructure in University libraries and use of ICT in terms of communication facilities, collection, hardware, software, networking infrastructure, housekeeping operations, user's services, training and problem areas of the university libraries. The paper concludes that university libraries of MP are in developing stage in its infrastructure and use of ICT. Lack of proper planning and supervision and frequent change in ICT are the basic hurdles in successful development of ICT in university libraries in MP.

- Anunobi, Chinwe V. and Edoka, Benson E. (2010). Use of ICT Facilities for Serials Functions in Southern Nigeria Federal University Libraries. *Scholar Website*.

The study revealed that what the serial operation of the southern Nigerian Federal university libraries performed with ICT facilities.

- Kannappanavar, B.U. and K.B, Ravi (2010). *Application of Information and Communication Technologies in Some Selected Special Libraries In Bangalore (Karnataka)*.

This study was conducted to investigate the application of ICT in some selected special libraries in Bangalore (Karnataka). The analyses revealed that though the libraries had hardware, software, and communication facilities to some extent, ICT-based resources and services were not reaching the users to the expected extent. The study provides recommendations to enhance library automation and effective and efficient application of ICT.

- Kumar, B.T. Sampath and Biradar, B.S. (2010). Use of ICT in College Libraries in Karnataka, India: A Survey-Program. *Electronic Library and Information System*: 44(3): 271-282.

The study presents a comprehensive survey about use of ICT in College Libraries in Karnataka. The findings help college librarians, local government and also the UGC, New Delhi to evaluate the collage library status in Karnataka. The purpose of this study is to examine the use of ICT in thirty one college libraries in Karnataka, India by investigating the ICT infrastructure, current status of library automation, barriers to implementation of library automation and also librarian's attitudes towards the use of ICT.

- Mandal, Arub Kumar and Bandyipadhyay, Amit Kumar (2010). Application of ICT by Related Manpower Problems in the College Libraries of Burdwan. *Journal of Library & Information Technology*: 30(4): 44-52.

The study exposed that the application of ICT in academic institutions in West Bengal has increased in the recent years but the computerization work of general degree college libraries of Burdwan Sadar (North and South) is very slow due to certain problems. The train manpower is one of the major causes of slow computerization and ICT application in collage library of Burdwan. They also examines the situation of IT application and related manpower problems in government-aided general degree college libraries of Burdwan Sadar (North and South), West Bengal.

- Devchaudhary, G.B. (2007). ICT and Electronic Library: Management and Delivery within the Traditional Library.

The study revealed that the electronic library is growing fast in parallel to the traditional library. It examines that Libraries are under a lot of pressure to achieve their noble goals much faster than planned, to adopt new technologies, to compete with others in managing the tremendous growth of information and to be able to lead in the area. The management and delivery of information in an electronic library differs from traditional library in many ways. The purpose of this paper is to collect the management and delivery problems rise out of adoption of the electronic library and to present possible solutions in the areas of five basic parts of scientific management-planning, organizing, staffing, directing and controlling.

- Haneefa, Mohamed (2007). Application of Information and Communication Technologies in Special Libraries in Kerela(India). *Library Review*: 56(7): 603-620.

This study provides recommendations to enhance library automation and effective and efficient application of ICT. It is conducted to investigate the application of ICT in special libraries in Kerela, India.

- Islam, Shariful and Islam, Nazmul (2007). Use of ICT in Libraries: An Empirical Study of Selected Libraries in Bangladesh. *Library Philosophy and Practice*

The study presents the needs of ICT and it changed the way of the work of libraries and information centers. The study also stated that Librarians, library patrons and supporters, and, above all, the government, must help develop ICT-based libraries to meet the changing demands of the users.

- Adeyoyin, Samuel Olu (2006). Information and Communication Technology Literacy Among the staff of West African University Libraries: A Comparative Study of Anglophone and Framcophone Countries. *The Electronic Library*: 25(4): 694-705.

The study contained original work that related to differences between English and French-speaking University staff as regards Information and Communication Technology Literacy and as such it will be useful for library technology planners and educators. The aim of this paper is to ascertain the ICT Literacy level among the staff of Anglophone (English-speaking) University library staff and their counterparts in francophone (French-speaking) University Libraries in West Africa.

- Chauhan, Buddhi Prakash. (2006). ICT Enabled Library and Information Service. *Winter School on ICT Enabled Library and Information Service*: 1-10.

This paper presents how conventional Library and Information Services (LIS) can be delivered more efficiently and effectively by using Information and Communication Technologies and it also highlights the new ICT enabled LIS profession particularly in a web based environment. It also discussed about how common ICT tools can be applied to provide new innovative service.

- Haneefa, Mohamed (2006). Information Communication Technology Infrastructure in Special Libraries in Kerala. *Annals of Library and Information Studies*: 53: 31-42.

This study examines information and Communication Technology (ICT) infrastructure and its importance in a modern library or information centre. It also exposed that ICT is the electronic means of capturing, processing, storing and communicating information. It encompasses an array of hardware, software, services and networks that enable access to digital information. This study investigates the current state-of-the art, information and communication technology infrastructure and the extent of the use of electronic information resources in special libraries in Kerala. The special libraries in Kerala have ICT infrastructure (like hardware, software and communication facilities) to some extent even then ICT based resources and services are not reaching to the users up to the expected extent. The findings of this study would assist special libraries in India to develop strategies and policies that could make better use of ICT based resources and services.

- Adeyoyin, Samuel Olu. Information and Communication Technology Literacy Among the staff of Nigerian University Libraries. *Library Review*: 54(4): 257-266.

This paper highlights a representative overview of the attainment level of library staff in an important area of professional competence, and it shows the importance of addressing the gap between the desired levels of Information and Communication Technology Literacy and the actual levels. The aim of this paper is to ascertain the levels of Information and Communication Technology Literacy among library staff in a range of Nigerian University.

1.9 Research Design

1.9(A) Statement of the Problem

The primary aim of any library vested with the providing services and to determine the user's satisfaction. As already discussed that, Information and Communication Technology (ICT) play dynamic role to accelerate the library services in managing information and various library operations and services and its use in the libraries has brought revolutionary changes in the library from collection management to delivery of services still then, the users are not amenable to adequate information for their study and research leading thereby to cause alarm among them. This is more prevalent in special library systems those covered under the study. Further, problems lie with the users regarding their acquaintance to the technologies adopted in the libraries under study.

1.9(B) Objectives of the Study

The objectives of the proposed research work are as to:

- Status of ICT infrastructures in the Special Libraries of Aizawl.
- Ascertain the implications of ICT in special libraries under coverage.
- Identify the limitations of the libraries in using ICT based services.

1.9(C) Research Methodologies

The following methods will be used for data collection and its analysis including interpretation in the study.

- **Questionnaire Method:** Two structured questionnaires will be framed with adequate questions relating to the study out of which, one will be for users to access the services being provided by the library and other for the librarian to ascertain the infrastructures developed by the library to provide the library services. The questionnaire meant for users was distributed randomly among 170 users and 124 (73%) user give their response for this study to elicit the data relating to the study. Further, another set of questionnaire meant for the librarian will be distributed among 16 librarians of special libraries in Aizawl and all libraries (100%) give their response to obtain the library data covered under study. A considerable amount of information on the resources, facilities, and services of this library was collected from their printed brochures, leaflets and web sites.
- **Interview Method:** For the supplement the data, I made a personnel visit to all 16 selected special libraries to gather same data through interview/discussion method relating to the study to know the status of ICT application in the library and to understand their practical problems in utilizing ICT facilities.

On the basis of data collected (through questionnaire and personnel visit) were coded and analysis and interpretation of data was done in keeping the view of objectives of study. The table and graphs are the tools used for data analysis and interpretations.

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2.1 Introduction

Soon after the down of independence, India launched a massive programme of development. Many large projects were undertaken to meet the needs for irrigation, power, and flood control and to establish a basic industrial base for steel, machine tools, fertilizers, transportation, drugs and pharmaceuticals, petrochemicals, power equipment etc. The country hardly had any industrial base or the infrastructure for the task of national building. A policy of planned development adopted. However, one of the major problems faced by the country during the early year of planning was the acute shortage of trained technical manpower. To meet the challenges and development of the society, an ambitious programme of expansion of technical education was undertaken to overcome the situation and establish many special institutions/organizations for education, research and development of the country as well as society.

In this Knowledge Society, every country have been try to build up their specialization in all directions to make popularize itself and to satisfy highly demands of information among citizens. Because of that competitive mind in the developed countries, numbers of specialized organizations or institutions are established in various fields of human activities as it is one of the important characters of the society. All these specialized organizations or institutions require specialization in their own field to carry out their functions, consultancy work, actions, activities, research and development program etc then they establish their own library known as special library to meet their special demand of information. The year 1909 might be the closest date to assign to the beginnings of special libraries in the modern sense and in that same year the Special Library Association which is one of the oldest and largest library advocacy groups specifically concerned with special libraries was also founded.

2.2 The Special Libraries in Mizoram

Mizoram state is situated in most eastern corner of country and under the process of development. The development of state is depend on good quality of technical education and research and to support good education and research, always we need a good library services because library is a centre from where we disseminate knowledge to develop and promote new knowledge for development of the society. Now the concept of libraries has been change and it is not only a center for store the book but it is a service center and with the help of ICT the approach and dimension of libraries has been changed. It is a responsibility of special libraries that with the application of ICT tools and services, they provide best library services to their users to assist in their education, research and development. The ICT has changed the world in a village and networking and resource sharing with the help of internet remove the gap between big and small libraries. With the help of these modern ICT technologies, small libraries can also provide good and satisfactory library services to their users.

In the Mizoram state there are around thirty (30) special institutions/organizations and more than 50% institutions/organizations are situated at aizawl district because it is capital of the state.

Among the special libraries in aizawl, the Aizawl Theological College (ATC) is the oldest organization and was established in 1907 as church organization by missionary where as the youngest library is National Institute of Technology(NIT) which is established in 2011. All these sixteen special institutions/organizations are set up with different aim and objectives for the development of society of the state as well as the Nation. All these special institutions/ organizations have libraries to support these institutions/organizations through providing information and knowledge to their users.

2.3 The Special Libraries in Aizawl

There are 16 special libraries in Aizawl and in all that special institutions/organizations 3(18%) of them are church organizations, 7 (44%) are state government organization 5(32%) are central government organizations and 1(6%) is private sector organization and 2 were established before independence and other are developed after independent (table no.2.2.1).

Table: 2.2.1: Type of Special Libraries

Sl. No.	Name 0f the Institution/Organization	Code name of Institution/	Year of Establishment	Institution/Organisation type
1	Aizawl Theologiical College	ATC	1907	Church Org
2	Synod Hospital	SYH	1928	Church Org
3	District Institute of Education and Training	DIET	1953	State Govt
4	All India Radio	AIR	1966	Central Govt
5	Assembly Secretariat	ASL	1972	State Govt
6	State Council of Educational Research & Training Wing	SCERT	1980	State Govt
7	Mizoram College of Nursing	MCON	1980	State Govt
8	The Administrative Training Institute	ATI	1983	State Govt
9	Doordarshan Kendra	DDK	1995	Central Govt
10	Regional Institute of Paramedical And Nursing Sciences	RIPANS	1996	Central Govt
11	College of Veterinary Sciences & Animal Husbandry	VETY	1998	State Govt
12	Women's Polytechnic	POLY	1998	State Govt
13	Academy of Integrated Christian Studies	AICS	2000	Church Org
14	National Institute of Electronics and Information Technology	NIELIT	2002	A.Central Govt
15	Institute of Chartered Financial Analysts of India	IGFAI	2006	Private Sector
16	National Institute of Technology	NIT	2011	Central Govt

The details of sixteen special libraries under the study are following:

1) **Aizawl Theological College (ATC):** ATC is under the Presbyterian Church organization and was established at 1907. Rev. D.E. Jones was the first missionary to take up the task of establishing a theological school in Aizawl. When Rev. J.M. Lloyd returned to Wales, Rev. C. Pazâwna became the first Mizo Principal of the College. The courses offered by this college are Certificate Course in Christian Studies Bachelor of Divinity, Master of Theology, and Doctor of Theology. Hundreds of pastors and church leaders have received their academic training and ministerial formation under the standards laid down by the Senate of Serampore College ever since its inception in 1907. The library room has three storeys which are attached under the chapel building. They have 9 library staffs which are 2 professionals, 3 semi-professionals, 1 professional with IT competence and 3 non-professionals staff. They have separate library budget that are Rs 12,00,000 for collections. They used DDC classification scheme to classify the collection. They have 44401 general books, 14365 reference books, 158 Indian journal, 93 foreign journal and 268 non-book materials. There are two OPAC computers and twenty computers for internet facilities for the users.

Pic: Aizawl Theological College, Durtlang

2) **Synod Hospital Library:** The Welsh Missionaries started this hospital and Nursing School and was established at 1928 under the Presbyterian church of Mizoram. Dr.John Williams converted the old Theological School building and used it for the hospital with the help of only two trained staff viz: D.Thianga Compounder and Tlawmkungi Staff Nurse. The hospital beds were procured from the old hostel. On the 1st February 1924 the Hospital recruited its first Mizo Doctor- Dr.H K Thanglura.In July Dr.R.K Nghakliana joined after completing his MBBS. The History of the Presbyterian Hospital can be divided into two periods, viz: (1) Under the Welsh Mission (1928-1958) and (2) From the time it was handed over to the Mizoram Presbyterian Church in 1958 to the present. From the beginning there were one Doctor, one Nurse and six beds in 1928 but now it has progressed to 23 Doctors, 12 of whom are Specialists, 114 Nursing Staff and 300 beds. The Presbyterian Hospital Nursing School library was established in the year 1928 at Durtlang, Aizawl. It is situated at about 10 Kilometers away from Aizawl. The library is situated at the first floor of the building with a well ventilated room. They have three library staff (1 professional and 2 non-professional staff). The citing capacity of library is 27 and has no separate library building. They have separate library budget which are Rs 50,000 for two years each. They follow DDC classification scheme to classify the collections and have 4635 general books, 220 reference books, 189 book bank, 11 different types of Indian journal, 1 type of foreign journal, 41 thesis, 20 conference or seminar proceedings and 11 non-book materials. Library all the time is recognized as the pioneer centre for knowledge dissemination. The topic of the present study is related to special library system as the library attached to the Presbyterian Hospital Nursing School proves incentives of knowledge to the students, nurses, doctors etc. and they form a special group of users.

Pic: Synod Hospital, Durtlang

3) District Institute of Education and Training (DIET): It was situated in 1st September 1953 under the central government, at that time Pi Lalziki Sailo was the head of office. But now it is under the state government and there are 70 incumbents in this office. Now it is headed by Pu Pasena Sailo with one Vice-Principal, 14 Lecturers, Superintendent, 2 Hindi Instructors, one Weaving, Knitting Agriculture, Craft and Sewing Instructor each, one inspector of statistics and other fifty one (51) staff. There are 9 trained teacher in Primary and 9 in Middle section. The DIET can accommodate 45 primary teachers 92 Middle teachers and 20 others every year. DIET also looks after practicing school. They have one library professional staff and no other looks after the library. They have no separate library budget and got library fund from student's admission fee. The library has 6309 collections that are general books, 400 text books, 300 reference books and 1 Indian journal. They used open access method for their library and did not follow any classification scheme to classify library books. The citing capacity of library is 15 and has no separate library building.

Pic: DIET, Chaltlang

4) **All India Radio (AIR):** It was started functioning 31st July 1966 under the central government. The radio stations of Aizawl also broadcast in Hindi, English and other languages. The AIR library does not have separate building and no separate budget as well. The All India

Radio, Aizawl has one of the lowest transmitting capacities in the North East Region as compare to other capital stations of the region and was given a 1KW MW transmitter in January 1970. The transmitting strength was raised to 10KW in 1975 and was further raised to 2X10KW MW in 1979 till date. They produced broadcast programs both in Mizo and English languages. They have 3 library staffs which are 1 professional library, 2 staff with IT competence. They classified their collection by using DDC. All their collections are tapes and have no print materials. They have three types of collections like Audio tapes, Analog tapes and Digital audio CD and have no print media collections. The Library has a number of archival value programs such as music, VIP talk, and VVIP talk. All the Digital copies of the library were preserved in external hard disk and in compact disk. The Library provides nine local newspapers and one national newspaper.

Pic: All India Radio, Tuikhuahtlang

5) **Assembly Secretariat Library:** It started functioning on 10th May 1972 with thirty elected and three nominated Members. Mizoram attained Statehood on 20th February 1987 and the first State Assembly was instituted in March, 1987 with a total membership of forty. A new Assembly Building was constructed and was occupied in 1996. Mizoram Legislative Assembly

has been a full-fledged member of the Commonwealth Parliamentary Association since 1987. Mizoram Legislative Assembly has a powerful Committee System. At present it has twenty standing Committees. Excepting the three financial Committees which are constituted for a term of thirty months, the term of all the Committees is one year from the date of constitution. Computerization of the Assembly Library and construction of Mizoram Legislative Assembly Website are the important achievements made recently in the field of Information Technology. Constitution of Budget Committee has a power to determine the size of the Annual Budget of the Assembly Secretariat with the approval of the Speaker. It is a significant milestone in a march towards independence of the Legislature. They have six information Kiosk machine to provide useful information about the House and others. CCTV is also attached at the important area or room to keep good security service.

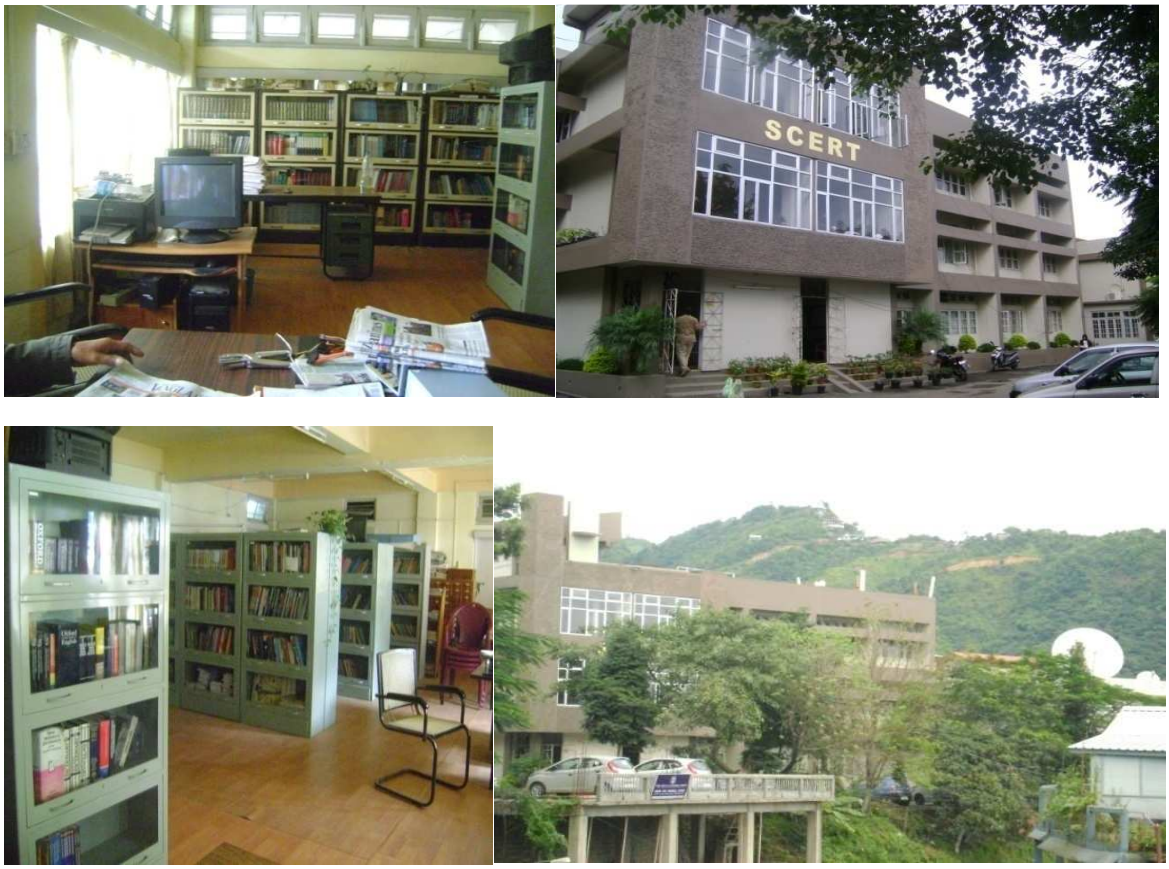
From the very beginning, Mizoram Legislative Assembly has been maintaining a very high degree of decorum in the House and ‘pandemonium' is a term almost unknown in this Assembly. With a view to upkeep, nurture and also to enhance the existing standard of decorum, a Code of Conduct for Members of Mizoram Legislative Assembly was incorporated in the Rules of Procedure, and Committee on Ethics has been constituted to oversee the moral conduct of Members and to examine cases of misconduct of members with reference to the Code of Conduct. Mizoram Legislative Assembly is the first Assembly to telecast live the entire proceedings of the session through local cable TV channels. This practice greatly helps the general public in acquiring firsthand knowledge of the functioning of legislature and the contribution made by each and every member in the shaping of the future of the state. At the same time, it greatly shapes the conduct and behavior of members inside the House immensely contributing to the enhancement of the existing degree of decorum.

Pic: Assembly Secretariat, Treasury



Pic: Assembly Secretariat, Treasury

6) State Council of Educational Research & Training Wing (SCERT): It was set up in January 1980. It is an academic wing of the Directorate of School Education and now is headed by Pi Malsawmthangi, Joint Director with two Deputy Directors. There are 24 Group 'A' Officers, 8 Group 'B' Officers and other 71 staff. SCERT is responsible for qualitative improvement of School Education from Primary to Higher Secondary Schools, Non-Formal Education and Teacher Education. It is also responsible for successful implementation of various education projects sponsored by Central Government, UNICEF as well as State Government. SCERT has its own separate department of ICT and always conducted training on that concern information. They have no proper library staff and have no separate library budget. The total collections of books are 11002 and have 9 different types of journal.



Pic: SCERT, Chaltlang

7) Mizoram College of Nursing (MCON): MCON in the earlier known as GNM Nursing School and was established in 1980 under Health and Family Welfare Department. It has been started since 1980 with a capacity of 20 intake students for General Nursing & Midwifery course. About 500 students have passed out from this institution. The institution was upgraded to College of Nursing on 11 October 2005 to conduct Bachelor of Science in Nursing 4 years course. The institution has gained the following facilities like Library, Computer Lab, Nursing Lab, Class room, Hostel, Mental Health experience at LGBRIMH, Tezpur, Spoken Hindi Class and English Voice enhancement Skills. At present the college offers BSc Nursing course.

The library of MOCN was established in the year of 1981and had no separate building and no separate budget as well. They have no proper library staff and only one library in charge that is semi-professional took care of the whole library services. The library collections are arranged according to their subject wise. They have 530 general books, 2500 text books, 10 Indian journals, 12 foreign journals, 25 government publications and 50 conference/seminar proceedings. They have no proper classification scheme.

8) **The Administrative Training Institute (ATI):** It was established in 1983 under the state government. As the premier training institute of the State, it conducts Foundation Courses for various levels of Government servants including the State Civil Service Officers. It also conducts orientation and refresher courses for all categories of Government servants of the State. The Institute's Campus is divided into four Blocks such as Administrative Block, Lecture Hall & Library Block, IT & Disaster Management Block and Auditorium. It has five Lecture Halls and two Computer Labs furnished with modern presentation equipments. The Institute's Library is also furnished with reading rooms and more than 8,000 volumes of books on various subjects. They have 2 library staff (1 professional and 1 non-professional). They have no separate library building and have no separate library budget as well. They used DDC classification scheme to classify the collections.

Pic: ATI, New Capital Complex

9) Doordarshan Kendra (DDK): It was established in 1995, around 156 people are working in the department but there are only 2 library in-charges for the library. There are so many sections in this station such as editing room, news room, production control room, engineering room etc. There are two types of library like tape library and books library. They

have no separate library building and no separate library budget. Air condition is used to prevent library collections. Actually it is a tape library and has no professional staff to keep that library.


Pic: DDK, Durtlang

10) **Regional Institute of Paramedical And Nursing Sciences (RIPANS):** RIPANS was established in 1996 with the project fund of Rs.2315.39 lakhs during the 9th Five Year Plan. To provide the need of basic paramedical health care facilities in the health institution of the North Eastern Regions, RIPANS was finalized by the North Eastern Council in 1992-93 with the approval of the government of India. All the allotted seats of that institute are distributed as per quota fixed for to the beneficiary states. Since the inception, a Medical Laboratory Technology certificate course of 1-1/2 year duration was started. Formerly the name was Regional Paramedical and Nursing Training Institute (RP&NTI) and was renamed as Regional Institute of Paramedical and Nursing (RIPAN). But later the word 'sciences' was added and the institution was named Regional Institute of Paramedical and Nursing Sciences (RIPANS). It is planning to start a 100-seat MBBS and BDS seat learning center for which project estimate has been submitted and the RIPANS is affiliated to Mizoram University.


Pic: RIPANS, Zemabawk

Pic: RIPANS, Zemabawk

11) **College of Veterinary Sciences & Animal Husbandry**: It is one of the constituent colleges of the Central Agricultural University and became functional with the admission of first batch of students to BVSc & AH degree course in the 1997. Lalnuntluangi Hmar is now the in charge dean of the faculty. The library was situated in 1998 and has a good collection reading materials in the form of books, journals, bulletins etc. It subscribes 52 National Journals and 15 International Journals. Library procures the latest edition of books or publications from different sources. There are 4 library staffs (2 professionals and 2 non-professional) and have separate library budget. They used DDC classification scheme for classifying the collections. They have 225 general books, 6216 text books, 3005 reference books, 43 thesis/dissertation, 52 government publications, 112 conference/seminar proceedings and 205 soft copies.

Pic: College of Veterinary Science & Animal Husbandry, Selesih

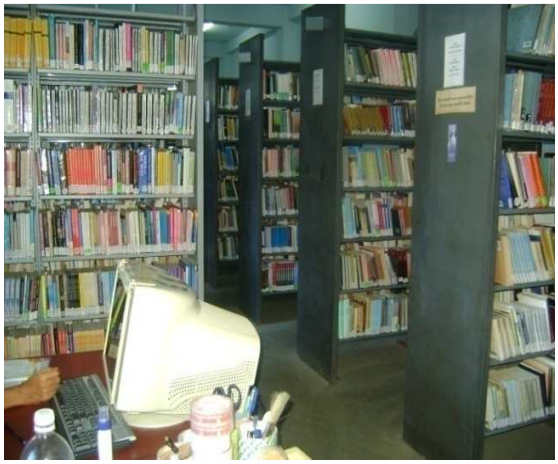
Pic: College of Veterinary Science & Animal Husbandry, Selesih

12) Women's Polytechnic: The Government of Mizoram established Women Polytechnic on the 7thSeptember 1998 with approval from All India Council for Technical Education (AICTE). It is under the administration of the Directorate of Higher & Technical Education, Govt. of Mizoram. It is set up with the objectives of making available facilities for technician education, quality improvement and training in specific fields of technology specially designed for women. The library has 3 staffs (2 professional and 1 non-professional). They have no separate library building and no separate budget as well. The citing library capacity is 50 and used DDC classification scheme of classifying collections. They have 7342 general books, 786 reference books, 11 Indian journals, 25 conference/seminar 718 and 770 non book form of library materials.

Pic: Women's Polytechnic, Durtlang


Pic: Women's Polytechnic, Durtlang

13) Academy of Integrated Christian Studies: It is situated in 2000. It is affiliated to the Senate of Serampore College (University). It is affiliated to the Senate of Serampore College (University). The College is operated by the Baptist Church of Mizoram. AICS offers the following Academic programs are Diploma in Church Music, Bachelor of Divinity, Master of Divinity, Masters in Development Studies. They have 3 non-professional staff and have no professional staff in the library and the library has 70 citing capacity. They have no separated library building but have separate library budget. They introduced library open access method. They have collections of 18,000 books, 60 Indian journals, 50 foreign journals and 120 thesis/dissertation. They used DDC classification scheme to classified collections.




Pic: AICS, Tanhril

14) National Institute of Electronics and Information Technology (NIELIT): It was established in 2002 and is one type of autonomous central government. They have only one

professional staff and have no other library staff. They have no separate library building and citing capacity of library is 45. The collections are 6636 general books, 719 reference books, 17 Indian journals and 1 conference/seminar proceedings. They used DDC classification scheme to arrange collections.

Pic: NIELIT, Zuangtui

15) Institute of Chartered Financial Analysts of India: It is one kind of private sector and was established in 2006. They have no separate library building and no separate library budget. They have 2 staffs (1 professional and 1 no-professional). They have 1500 general books, 10,000 text books, 500 reference books, 7 Indian journals, 21 magazines, around 50 thesis/dissertation and 500 soft copies. They have DDC classification to classified collections.

Pic: ICFAI, Durtlang

Pic: ICFAI, Durtlang

16) National Institute of Technology (NIT): It was established in 2011 and is under the central government. They have no separate library building and no separate library budget. There are two library staffs (2 professional and 1 non-professional staff). They have 4500 general books, 500 text books, 200 reference books, 20 conference/seminar proceedings and 200 soft copy materials. They also subscribe 1300 Indian e-journals and 200 foreign e-journals and databases of AICTE- Indest consortium. They used DDC classification scheme.

Pic: NIT, Chaltlang

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3.1 Introduction

The last two decade in the global arena has witnessed a tremendous growth in the area of computer technology. Rapid advances in the technologies for communication media like television, computer, internet, printing and publishing has enable us to get prompt access to required information. The computer is the most versatile machine man has ever made. The use of computer at home has become reality and the use of computers at work place is very common. Now all most all government departments, commercial organizations and educational institutions are using computer and have accepted the computer as a major tool to renovate their function. Computer are being used in multiple areas ranging from solving intricate scientific problems to art, cultural, historical, accounting, financial, medical and even domestic sectors. Information technology has made a significant impact on all dimensions of our day to day life eq. reservation of air and railway tickets, buying and selling items on internet, electronic market, bank, hotel reservation, entertainment, education and communication etc. Information technology has replaced the conventional methods to solve technical and problem by introducing a much faster and more convenient method which is based on its ability to access larger and complex pool of data.

The world is changing at a very fast pace. The changes can be seen in every aspect of life. One of the most factors of changes is technology. The world "technology" originated from Greek word- *tecne* and *logic* where *tecne* means skill and *logia* means study of science. Technology is the knowledge generated for the purpose of development of new systems to help in solving the practical problem. Using the technology, information can be easily gathered about various fields such as weather forecasting, space exploration and much more. For the development of technology, information is essential. Information is the collections of facts gathered through various means of communication (for example- people, news paper, television etc) and play a important role in drawing a conclusion. At the same time technology makes information gathering fast and easy. Information along with technology has created a new branch called- ***Information Technology (IT)*****.** IT involves the processing of information by computer and it is possible through the use of hardware, software, services and supporting infrastructure to manage and deliver information. Now the term IT was replaced by ICT which is a broader term because now IT combined with telecommunication and networking to communicate information. **Information Technology refers to the basic level of involvement in the use of computer technology while Information Communications Technology (ICT) equipment is networked together allowing communication with others on the network and in the outside world via e-mail and the internet.** The composition of Information and Communication Technology (ICT) includes computers hardware & software satellite wireless technology, RFID and Internet and these different components of ICT work together and combine to form "Networked World" and reach every corner of globe.

The notion of information and communications technology (ICT) incorporates the networking together of computers. This allows computers to do stand-alone type tasks more effectively,

insofar as it potentially makes available a wider range of shared software held centrally on servers and can make management of the system easier and more efficient. The key to ICT, however, is in the possibilities for communication, both within and between institutions The software added into the mix by the move from IT to ICT includes communications software, such as Microsoft Outlook, browser software (such as Internet Explorer and Netscape) and web authoring packages (such as Dreamweaver). The capability to produce and maintain a college web site or its internal equivalent and an intranet opens new opportunities for communications. The people skills involved can be classified as user/receiver (browsing, reading e-mail) or creator/sender (web authoring, sending e-mail).

The ICT is an acronym for information communications technology. ICT is concerned with the storage, retrieval, manipulation, transmission or receipt of digital data. The data is transferred or communicated to people over long distances electronic means ICT is much more than computers and the Internet or even telephony, even though the digital divide and issues of Internet governance were much of the focus of WSIS. Applications of ICT can be divided under two broad categories. The first are those largely dependent on traditional telecommunications networks (including internet) that enable on-demand communications to provide information tailored to the user's convenience and needs. How that information is processed, whether it is used at all, and whether it is transformed into knowledge is left to the human user who asked for that information in the first place. The second group of ICT applications, for want of a more appropriate name, we shall call Human Independent, where information is processed and decisions are arrived on the basis of preset criteria without human intervention at the time of decision making. These can be nearly passive systems, or part of a larger system (embedded ICT). Examples include sensor-based networks that determine automated climate control for buildings today, or, in the near future, sensor networks for malarial larvae detection. Many of the more-discussed applications of ICT for SD are of the first category, ranging from distance education programs, e-commerce, or e-governance, while the second class of applications remains largely unrealized. A major challenge is how to design both ICT and other complex engineering or societal systems such that the two can be integrated.

The development of ICT in a library have greatly changed the methods of information handling as it comprised the tool and procedure methods to facilitates acquisition, circulation, generation, dissemination, transmission, organization, searching, viewing, updating, storing and retrieval of information. Applications of ICT in a library are the uses of e-resources, workstation facilities, server, library automation, internet facility, bibliographic databases, library networking and resource sharing, digital library, library networks etc.

3.2 History of Application of ICI in a Library

The American pioneers of library automation were outlasted more than other countries. In 1930s, Herman Hollerith of the US Census Bureau invented Punch Card technology with the help of Dr.

Jolul Show Billings, the efforts of library automation system was began at that time. In 1936, Ralph Parker installed Hollerith punch card system at the University of Texas for circulation control of the library and in the mid of 1940s the system was also experimented in the serial record control. In 1950, the Library of Congress introduced a book catalogue using punched cards. In 1960s the first library automation was developed in US. In the 1970s, integrated computer chip and storages devices were also developed and RLIN and WLN was started the online library networks. Some libraries using microcomputers of their organizations to started automation during that decade. In 1980s, the use of computers in libraries increased greatly. The more user friendly and lower cost microcomputers were rapidly developed. Many library automation packages came into the market and in the late 1980s CD-ROMs that contained databases, information and software were also introduced. In 1990s the development of computer networking was started. The overwhelming explosion of technology with the latest one penetrate the library automation system till date that started using high technology services and security system in the library to facilitate information protection, sources and services. Library automation in India was first started at Hyderabad whereas Aizawl Theological College (ATC) was begun their library computerized in 2002 and is the first library automation in Mizoram.

It seems like all the pioneer library automation were comes out mostly from USA and others from British because they firstly started library automation and ICT application in the library. The ex-Librarian of British Library Maurice B. Line said about the pioneer of library automation in his article that 'Forty years of library automation: a personal reflection' said that "While I was in Newcastle one of the first major conferences on library automation took place at Brasenose College Oxford. Most of the British and American pioneers of library automation were present; they included Fred Kilgour, Henriette Avram, Richard De Gennaro, Jack Wells and John Jolliffe. Also present were such figures as Sir Frank Francis, Douglas Bryant, Sir Peter Swinnerton-Dyer and Peter Laslett. Most of the papers were given by Americans, who were a few years ahead of the British. For myself, the main benefit was the contacts I made there, notably Dick De Gennaro and Fred Kilgour, whose contributions to library automation outlasted most of the others".

3.3 Library Automation

Library automation is the application of machines to carry out the library operation or activity. Computer is one of the most important tools to automate library, it enhances the activities of libraries in automating the operations. The computer technology coupled with telecommunication and multimedia technology has developed the new possibilities in handling and transfer of information. Library automation is important to provide more and very high speed information accession, to minimize staff requirements, it facilitates handling of huge data or information and it increases library uses. Because of that new technology application, Libraries are now able to offer services that are more effective. The basic requirements for automating library are the selection of computers with right hardware and software, computer

skilled professional, conversion and standardization of data, resources and services. Some popularly used library automation software is follows:

- Libsys [LIBSYS Ltd, Gurgoan (www.libsys.co.in)
- SOUL [INFLIBNET, USA (http://www.vtls.com)
- SLIM [Mr. Madhusudan Gaikaiwari & Mrs. Meera Gaikaiwari (Algorhythms), Pune (http://www.slimpp.com/slim21site/default.htm)]
- E-Granthalaya [NIC, New Delhi (http://egranthalaya.kar.nic.in)]
- TLSS

3.3.1 Computer infrastructure requirements for complete automation

1. **Hardware and software**: The two components of computer are hardware and software; hardware is the collections of physical elements that build a computer system. It refers to the physical parts of computer such as monitor, keyboard, computer data storage, hard drive disk, mouse, system unit (graphic cards, sound cards, memory, motherboard and chips), etc. all of which are physical, objects that can be touched. Software has no physical substance and is untouchable. Software exists as ideas, application, concepts and symbols.
2. **Processor:** Sometimes it is also known as microprocessor. It is a small chip that resides in computers and other electronic devices. The basic job of processor is to receive input and provide the appropriate output. It can handle trillions of calculations per seconds. It is the logic circuitry that responds to and processes the basic instructions that drive a computer.
3. **Central Processing Unit (CPU):** It is the hardware within a computer that carries out the instructions of a computer program by performing the basic arithmetical, logical input and output operations of system. It contains ALU (arithmetic logic unit) which performs arithmetic and logical operations, and, Cu (Control Unit) which extracts instructions from memory, it decodes and executes them, calling on the ALU when necessary.
4. **Power Supply:** At the bottom it has its own cooling fan. A power supply unit converts alternating current electric power to low-voltage DC power for the internal components of the computer.
5. **Motherboard:** It is the main component inside the case. It is a large rectangular board with integrated circuitry and connects the other parts of the computer. The components directly attached to the motherboard includes-
    - CPU
    - The Chipset
    - RAM
    - ROM
    - Buses [that connect the CPU to various internal components and to expansion cards for graphics and sound. For example; **PCI Express** *(for expansion cards like graphic, sound, network interfaces, TV tuners),* **PCI** *(For other expansion cards),* **SATA** *(For disk drive),* **AGP** *(Superseded by PCI Express),* **VLP** *(Superseded by AGP),* **ISA** *(expansion card slit format obsolete in PC),* ATA, EISA]

- Ports [for external peripherals. For example USB, Memory Cards, Fire Wire, SCSI, Serial Port, Parallel Port, Game Port].

6. Expansion Cards: It also known as expansion board, adapter card or accessory card. In computing the expansion card is a printed circuit board that can be inserted into an expansion slot of a computer motherboard or backplane to add functionality to a computer system via the expansion bus.

7. Secondary Storage Devices: Computer data storage, often called storage of memory, refers to computer components and recording media that retain digital data.

- **Fixed Media;** Hard Disk drives**,** Solid-State Drives**,** RAID array controller
- **Removable Media;** Optical Disk drives (Compact Disk such as CD-ROM, DVD, DVD-RAM and Blu-ray Disk)**,** Floppy Disk Drives**,** Zip Drives**,** USB Flash Drive Plug**,** Memory Card Readers**,** Tape Drives.

8. Computer Output: Output devices display information in human readable form. It includes Computer Monitor, speaker, Printer (laser printer, Inkjet printer, Dot Matrix Printer, Thermal Printer).

9. Computer Input: Input devices allow the user to enter information into the system, or control its operation. It includes Text input devices (keyboards), Pointing devices (mouse, trackball, touch screen), Gaming devices (joystick, game pad, game controller), Image or Video Devices (image scanner, web cam), Audio Devices (microphone).

10. Barcode Reader: It is a simple machine readable codes that the computers can reproduce directly into the bit streams 0's and 1's. It is a series of black bars and white spaces of varying breadths. The code is read by a scanning device which send message to the computer that determines the code from the width of bars and spaces. The basic requirements are Data entry terminal, Decoder (inbuilt/external), Scanning device, printer, collection database, membership database, labels, communication software, and software for generating barcode.

11. Radio Frequency Identification (RFID): It is a combination of radio frequency based technology and microchip technology. The information contained on microchips in the tags that is affixed to the library materials is read using radio frequency technology. RFID uses RF to identify "tagged" items. The data is collected and transmitted to a host system using an RF Reader. The data transmitted by the tag may provide identification or location information, or specifics about the product tagged, such as price, colour, date of purchase, etc. The RFID gates at the library exit may be as wide as three feet because the tags can be read at a distance of up to two feet by each of two parallel exit gate sensors.

3.3.2 Areas of Library Automation

In the fully-automated-library there are two types of operation works; Library House-keeping Operations and Library Information Handling Operations which are performed with the help of computers. Library automation encompasses the house keeping operations which are performed by computers. The house keeping operations brings acquisition, cataloguing, circulation and serial control, this is also called the core functions of library.

- **Acquisition :** It plays a vital role in a library, it builds up information resources by ordering and purchasing of books or non-print items. The activities of acquisition in a library comprises budget management, Book/non-print material selection, preparation of order list, sending orders to the publishers, duplicate checking, payment of bills, stamping, accessioning, updating record file and control of book budget.
- **Cataloguing :** It is a list of documents which it includes whole information about document like call number, accession number, author, title, publisher, publishing place and year etc. The activities of cataloguing includes preparation of main entry, added entry, authority files, index files/subject heading list, arrangement of catalogue, centralized and shared cataloguing possible, provision of access points in a variety of ways and in an appropriate physical form, OPAC Database and report.
- **Circulation :** It is one of the most important roles in the library, it is regarded as the centre of activities in the library. The works of circulation involves making bar-coded at the member ID cards, bar-coding of the library materials, issue and return, reservation, renewal, reminder, recall, collection of overdue charges, inter library loan, library gate control system, withdrawal, stock verification and binding.
- **Serial Control :** Serial control is recording and maintenance of data regarding serials subscribed by a library. Computerization of serial control leads to effective and efficient control over subscription, claiming, reminders and cancellations (Thapa2007). The activities of serial control includes selection and approval, acquisition, inputting of serial data, ordering of new journals, renewal of subscription, receipt and control, accessioning, invention of lists of serials/data files, indexing article, interface with union catalogue.

3.4 Internet Facilities

Internet is a network of networks and is a global network connecting millions of computers. It carries wealth information and always called as super highway of information that work as a World Wide Web channel of communication. It allowed sharing of data, an interaction between computer-networks can be done due to the telecommunication technology and having a common language among them. There are three most common ways to connect internet which are Dial-up connectivity (a temporary internet connections generally over a telephone line using a modem), Dedicated connectivity (a direct internet connection via a router) and Broadband (The term broadband includes a broad range of technologies, all of which provide higher data rate access to the Internet. These technologies use wires or fiber optic cables in contrast to wireless broadband described later).

Some important terms of internet are IP address (every computer connected to the internet must have a different identifier number for not to get any sending mismatched, no two computer can have same IP address or number), Domain name, URL/web address, Internet service provider, packet, website, web server, protocol, web, Host.

The protocol is needed to run internet, it is a common framework of routines and rules to allow computers to communicate with each other. It is a set of rules and is required in the computer networks to follow when two computers communicate each other. The most popular protocol used in the internet is TCP/IP (Transmission Control Protocol/Internet Protocol).

There are internet services which are World Wide Web (it is a system of interlinked hypertext documents accessed through internet. It can send documents or pages to internet user who navigates from server to server by means of web-browser software. Web document contains text, sound, image video, other multimedia and they can be interactive). E-mail (It is transmission of electronic massages over the internet). Search Engine/Meta Search engine (It assist us in locating information on the web and internet). File Transfer Protocol/FTP (It can transfer computer files from the remote computers to the personal computers by a program in internet). Telnet (It is a facility by which one can log on to a remote computer or network. It runs over TCP/IP protocol and can be used to access commercial databases such as DIALOG). Wide Area Information Server/WAIS (it is a tool that allows user to search indexed texts or textual materials from the remote databases. It connects the user directly with indexed document). Hypertext Markup Language/HTML (It defines several aspects of web page including heading levels, bold, italics, images, paragraph breaks and hypertext links to other resources. It helps to bring together other Internet Protocols and services available through the web like ftp, Gopher, Usenet, e-mail, WAIS, Telnet and HTTP). Discussion Group (It includes variety of services like mailing list, news group and chat groups). Usenet (It is user network, and largest discussion forum throughout the world. Thousands of discussion groups make Usenet), Veronica, Gopher etc.

There are also networks which are not connected to the internet allowing easy exchange of data at home or in an office environment. All the computer information is stored digitally and the information transmitted over telephone lines is transmitted in the form of analog waves, a modem converts between these two forms. A Modem is very important device that converts a computer’s digital signals (binary numbers) into specific frequencies to travel over telephone or cable television lines. At the destination, the receiving modem demodulates the frequencies back into digital data. The computer use modem to communicate with one another over a network.

At the earlier time a person could work just only on computer but later on LAN technology was developed that connected some computers in the same area with the help of a cable system and then able to access information available on other connected computers while a person working on his computer. For further advancement in internet technology WAN (Wide Area Network) was developed to locate far away connected connections by means of computer through cable or satellite systems. There is another great development on the internet is World Wide Web (WWW) that links computers on the internet like a spider web. And then, we can access and used information that is available on internet at anywhere in the world.

Internet has become an important tool to transfer fast information and offers a variety of services to create, browse, access, search, communicate and views information. Internet also plays an important role to enhance library services in providing better information service. The information services available on the internet are e-journal, e-book, Library index, library catalogue, technical reports, online-databases, online-OPAC, e-mail based information services, reference services, content page of journal, Online bibliographic databases, etc. All these services provide wealth and useful information that can be access through telnet, gopher, web and search engines (example of search engine: Google, AltaVista, Yahoo, Infoseek, Hot Bot, etc.). There are so many e-publications on the internet which are very fresh, useful and latest edition for the library user. Therefore we can say that internet has become a great tool for the researcher and is a very good part of academic work.

3.5 Library Resource Sharing and Networking

Library resource sharing and library networking have same meaning and can be said that sharing of library resources like books, periodicals and other materials by means of electronic device and other software. The sharing of library resources started with the concept of inter library loan, under which a library can get a document from another library on loan for a certain period. It was followed by the term "Library Cooperation", but now in its revised and improved form it is called as "Resource Sharing". Today, it is called "Library Network" or "Library Consortia", which is one of the cooperative ways of sharing online resources (netugc.com). Networking can provide a powerful communication media among widely separated people in different areas or countries of the world. Network is a collections of computers and communication hardware and software linked together for sharing of the provide resources and facilities among the participating library.

3.5.1 Types of Network

The term Network is used between a systems of computers connected by transmission channel. There are three types of network such as LAN, MAN and WAN which are groups of computers and network devices connected together.

a) LAN (Local Area Network): It is a computer network within the same building. A LAN connection is high speed and relatively inexpensive. It is useful for sharing resources like files, printers, games or other applications. Most LANs are built with relatively inexpensive hardware such as Ethernet cables, network adapters, and hubs.

b) MAN (Metropolitan Area Network): It is a network design for a town or city. Some technologies used for this purpose are Asynchronous Transfer Mode (ATM), FDDI, and SMDS. These technologies are in the process of being displaced by Ethernet-based connections (e.g., Metro Ethernet) in most areas. MAN links between LANs have been built without cables using microwave, radio, or infra-red laser links.

c) WAN (Wide Area Network): It is the computers connected by telephone lines or radio waves. The world's most popular WAN is the Internet. Many WANs are corporate or research networks that utilize leased lines.

3.5.2 Network Topology

The term topology refers to the way a network is laid out, either physically or logically. It means that the way to connect the computers logically to each other for communication. It is a geometric representation of the relationship of the computer links. There are basically five type of network topology as stated below:

a) Star Topology: In this network topology all the computers and peripheral devices are linked to the central unit. The central unit in the network is called Hub. The computers cannot be direct communication between the devices. If one of them wants to send a data to the other devices, it will send to the hub first which then relays the data to the other connected devices. If one terminal link is failed that will not affect other link and all other link remained active but when the server fails the entire network is held up.

b) Ring Topology: Each device is connected to the other devices in this topology forming a ring. There is no central file server messages are passed around the ring they reaches the correct destination. In this topology if one internal link is failed then the entire network is unable.

c) Bus Topology: It is a single communication channel routed along a path in which various devices can be attached. Each device handles its own communication control. There is no host computer as the information process along the bus.

d) Mesh Topology: It have multiplicity of paths from one computer to another computer, it permits any two devices to communicate directly within a network. If one link becomes disable it down the entire network.

e) Tree or Hierarchical Topology: It is a combination of linear and star topology character. It consists group of star configure work stations connected to a linear bus cable server computer that is located at the highest order of hierarchy.

3.5.3 The Switching Techniques for Data Routing

Switching is a technique that can determine how connection between computers is made and how data transmission is handled on a network because an individual computer would not be normally be communicating with every other computer on a network. Sometimes most of the lines would be unused in a fully connected network. Therefore, to increase the utilization of connection circuits, their number is reduced and the switching technique is introduced within the network. There are three type of switching techniques, which generally used in networking:

a) Message switching: This characteristic is known as store and forward because the process by which data transmissions were stored until a proper circuit is available so that they can be forwarded. It means that if the entire network's resources are engaged or the network becomes blocked, the message switched network stores and delays the message until ample resources become available for effective transmission of the message.

b) Packet Switching Network: It move data in separate small blocks (packets) based on the destination address in each packet. When received packets are reassembled in the

proper sequence to make up the message. It uses two different technologies for sending messages and data from one point to another.

c) Circuit switched networks: It require dedicated point-to-point connections during calls. Circuit switched networks were used for phone calls and packet switched networks handled data. It uses two different technologies for sending messages and data from one point to another. In modern circuit switched networks, electronic signals pass through several switches before a connection is established and no other network traffic can use those switches during a call. The resources remain dedicated to the circuit during the entire data transfer and the entire message follows the same path.

3.5.4 Network Devices

The networks are becoming more complicated and more pervasive day by day. The term like switch, router, repeaters, bridge etc have become part of our language. Every network has route to transmit data between two remote machines that is called routing. These devices interconnect individual computers and ensure that they communicate efficiently. The different types of network devices are listed below which are very commonly used in networking:

a) Repeaters: It receives the incoming signal and then repeats it, it strengthened that signal and retransmit the transformed signal. It is necessary when the transmission lines run over long distances, it also amplify any noise that has been introduced into the digital message.

b) Bridges: It is a device and is used to connect two networks to be performed as one. It makes partition of one large network into two networks which subsequently increases the performance of the network.

c) Routers: It shows the right path for the data what it sends to the other network. It means routers enable a computer to share files with other computer in the network or internet and it protected a computer against unauthorized external access at the same time.

d) Gateways: It is software that complicated interconnection device. It helps two machines that have different operating system or transport protocol to transfer data between themselves.

3.5.5 How to Make Library Resource Sharing

A librarian, when he heard the term resource sharing, many questions come in mind like- How to share resources and information through networking? What other resources that can be shared; what is the need of networking; what are computer software and hardware requirements and it should be consider at first because library resources sharing can be implemented only after analysis and then designing the system. Actually the computer, hardware, software and networks cannot work independently and it needed systematic coordination with each other. The library professional needs to know the basics of computer and networking tools and techniques. For library resource sharing, first we have to computerize (automate) our library with library

management software and store all the records on server and connect this server with intranet/internet. For the resource sharing we need a network- if we want to share library resources within campus then we need campus LAN and if we want to share library resources all over the world, then we connect it through internet. For supporting library consortium requirements computer with high speed internet connection is required.

3.5.6 Infrastructure Required for Networking

Computer server (i7, Speed 450 MZ), Computer memory (16 MB expandable up to 128 MB), Operating System Software, Hard Disk (20 GB or more), Server Network Interface Card, Network-Compatible applications programs, Usage monitoring software, Virus protection software, Uninterrupted power supply (UPS), CD-ROM/DVD-ROM Drive, Network Cards, Cable and connectors, Wiring hubs, signal boosters, Web server, multimedia kit, modems, scanner, operating system, web browsing tool, Optical Character Recognition (OCR) Software and good internet connectivity.

3.5.7 Areas of Resource Sharing and Networking

The network should be able to access some areas over the internet like electronic online catalogue, indexes, Inter library loan, Cooperative procurement, Co-operative technical operation, preparation of union catalogue, co-operative storage, browsing privilege of cooperative members, cooperative in documentation, exchange of experts, cooperative inter-library loans, Document delivery service, consortia, collection development etc.

3.5.8 The Objectives of Library Resource Sharing and Networking

The main objectives of library resource sharing and networking are:

- By exchanging library resources and information for the user that will help the user to access the resources which are not available in their own library.
- To facilitates the maximum utilization of resources.
- To avoids duplication in resources.
- To make overall improvements of library services.
- To provide better library services with less budget and safe the times of user.
- To develop sharing policies for inter library loan and reciprocal agreements for special collections.

Nowadays the cost of reading materials like books, journal etc are increased in day by day so that libraries are facing difficulties to acquire collections. The published duration of print materials take a long time so that print materials may not relevant enough in compare with soft copy which is available on the web. The soft copy can be access rapidly on the web at anywhere and then the emphasis is now shifting hard copy to soft copy to provide immediate information service. Therefore, library resource sharing and networking is very important in present ICT era.

3.6 Digital Library

The first use of the term digital library in print may have been in a 1988 report to the Corporation for National Research Initiatives. These draw heavily on As WE May Think by Vannevar Bush in 1945, which set out a vision not in terms of technology, but user experience. The term virtual library was initially used interchangeably with digital library.

A distinction is often made between content that was created in a digital format, known as born-digital, and information that has been converted from a physical medium, e.g. paper, by digitizing. It should also be noted that not all electronic content is in digital data format. The term hybrid library is sometimes used for libraries that have both physical collections and electronic collections.

The term digital library was first popularized by the NSF, DARPA, NASA Digital Libraries Initiative in 1994 with the funds of $24.4 million from the US federal. This funding came through a joint initiative of the National Science Foundation (NSF), the Department of Defense Advanced Research Projects Agency (DARPA), and the National Aeronautics and Space Administration (NASA). That US federal funds would be distributed for 'digital library' research among six universities which were Carnegie Mellon University, the University of California-Berkeley, the University of Michigan, the University of Illinois, the University of California-Santa Barbara, and Stanford University.

A digital library is a type of information retrieval system. It is a combine use of digital computing, storage, and communications machinery together with the contents like multimedia database, information mining, information warehouse, information retrieval, on-line information repositories, electronic library, imaging database, world-wide web (WWW), and wide area information services (WAIS). Software is also needed to reproduce and extend the services like collecting, cataloging, finding, and disseminating information

In this system, a collection of information is stored in a digital format in computer memories and accessible via computers that are available on the Internet or on DVD-ROM disks. On DVD-ROM, the amount of data is limited up to 4.5 gigabytes whereas dual DVD-ROM capacity is up to 17 gigabytes (GB), but the access is generally much faster than on an Internet connection. It can either be stored on local computer or accessed remotely via computer networks, a user may be able to access magazine articles, books, papers, images, sound files, and videos. Some traditional libraries have begun the task of converting classic books to electronic format for distribution on the Internet. Some files can be viewed directly in HTML format while others can be downloaded in PDF format and printed.

The use of a digital library on the Internet is enhanced by a broadband connection such as cable modem or DSL. To access plain-text documents and some documents containing images Dial-up connections can be used. But for the complex files and those files with animated video content, a downstream data speed of at least several hundred kilobits per second (Kbps) can make the user's

experience less tedious and more informative for them. Internet based digital library can be updated on a daily basis that is one of the greatest advantages of this emerging technology.

Electronic version of intellectual and artistic property has authors, agents and publishers which might be possibility of copyright infringement. It is much easier to copy or download or make unauthorized copies of an electronic book and DVD-ROM than the bound volumes and they are easy to distribute them illegitimately. Fundamental changes in copyright law protected all the materials from illegal use.

An agreement on a variety of metadata standards is a necessary prerequisite for interoperability of digital collections. The implementation of interoperability also requires a set of architectures and a common approach to making that metadata available to other collections, middleware, and end users. In this section we will discuss two philosophical approaches to metadata, as well as methods for sharing metadata with applications and individuals outside the designer's home collection.

Libraries have traditionally employed the MARC/AACR2 philosophical approach to metadata. This approach employs a single overarching schema to cover all types of works and all groups of users. As new types of works arise, new fields are added to the MARC/ AACR2 framework, or rules for existing fields are changed to accommodate these new works. And as communities emerge with new metadata needs, these are also incorporated into the existing schema. The MARC/AACR2 philosophy maintains that one big schema should serve all user needs for all types of works. Critics of this approach point out that the schema has become so overly complex that only highly trained specialists (library cataloguers) are able to assign metadata using it, and that the system is too slow to adapt to emerging types of works. They also claim that groups of users often have sets of metadata needs that the controllers of MARC/AACR2 are unwilling to accommodate.

In recent years, a rival philosophy has emerged from within the Dublin Core community. This philosophy, based upon the Warwick Framework, relies upon interlocking containers and packages of metadata, each maintained by a particular community. According to this philosophy, each community can support the packages of metadata it needs for its own particular uses, while still interoperating with the metadata packages from other communities. Under this philosophy, the Dublin Core serves as a unifying set of metadata to allow discovery across all communities. And even within the Dublin Core (DC), certain communities can employ qualifiers that meet their own detailed needs, while still providing useful metadata to other communities. (For example, the library community could use qualifiers to reflect the nuances of differences between main title, alternate title, transliterated title, and translated title, while other communities could find any of these as part of a search under unqualified title.) This philosophy supports metadata packages that are modular, overlapping, extensible, and community-based. Advocates believe that they will aid commonality between communities while still providing full

functionality within each community. This approach is designed for a networked set of communities to interrelate to one another. The traditional library model was to export MARC records to a bibliographic utility (like OCLC or RLIN) and to have all external users search through that utility. While this works fine for MARC-based records, increasingly users want to search across a much wider base of information from a world not circumscribed by bibliographic records (such as web pages and sites, PDF documents, images, databases, etc.).

Therefore, most digital collections are beginning to consider how to export reduced records into a space where they can be picked up by Internet search engines. For records following the MARC/AACR2 approach, this means extracting simple records (probably in DC format) from complex MARC records, and exporting these. For both the Warwick and the MARC/AACR2 approaches, this means developing methods for metadata harvesting that allow the appropriate exported records to be found by Internet search engines. A number of projects are currently under way to test metadata harvesting.

3.7 Changing Role of LIS Professionals in ICT Application in Libraries

The development of Information and Communication Technologies (ICTs) and their application in Library and Information centres (LICs) has changed the nature of collections; the needs of users; the library environment and the roles of LIS professionals. The old concept of book centred librarianship has changed to the user-centred librarianship. ICTs have paved path to new roles for LIS professionals. The LIS professionals as Creators, communicators, leaders, mentors, and life-long learners are monitoring the trends in technology continuously to provide global information instantaneously to end-users through ICTs.

In the web environment, every day changing in technology, options of sources and format of information and flow of information ha great impact on the role of libraries and library and informational professionals. In development of collection tools, techniques and approaches has increasingly entered in the field of library services globally. It force to change the way they are functioning in providing the information needs of their users. These new roles require different personalities for librarians as well as different skills and knowledge. The focus is on power to draw together different forms of communication, smoothly integrating them within a digital environment and providing access to the stored information using computer systems via telecommunications which are fast, friendly and interactive. The globalization of ICTs has posed various challenges before the LIS professionals in the nature of collections, the information environment and the radical change in the expectations and needs of the users. In digital environment, LIS professional’s competence lies in-

- Speeding up access to information
- Speeding up spread of information
- Filtering material chosen by users
- Organizing user information sources in standardized keyword and classification schemes

- Developing expert vocabulary

Before adapting to any changes in libraries, the LIS professionals have to analyze the organizational conditions, to what extent both higher officials and team members are willing and prepared to accept these changes. When creating a new role within the digital library, the LIS professionals must have the curiosity, adaptability, flexibility, confidence and ability to interact with users outside the library, a passion to educate, can do attitude with team-oriented spirit, and ability to think globally. Creativity is required to deal with the changes in collections, services, and users.

The LIS professionals in libraries will become agents of accessibility and integration, linking users to a range of digital information available through licensing agreements or other means. LIS professionals have been working to re-tool library services in order to make them more useful for patrons to find organize, and interact with information in a way that has infinite potential for user customization. These new types of services are a shift from "isolated information silos" to "interlinked computing platforms".

Smith (2006) proposes nine important factors which are key elements to achieve successful and sustained change by any LIS professional. They are; Ensure readiness for change; Plan for change; Lead change; Manage change; Support change; Deal with resistance to change; Communicate effectively; Follow through, evaluate, learn; and Attend to the human factor. Ashcroft (2004) suggested the qualifications for a modern librarian to be a mix of old and new ones and that synthesis derives from the need to organize documents and information in a hybrid environment. He identified six basic skill categories:

- Professional
- Marketing and promotion
- Evaluation
- Communication – negotiation – collaboration
- Censorship
- Personal transferable skills

As new technologies come along Library and Information Science (LIS) professionals experiment and try to find ways to employ the new tools in their libraries. Technology has posed a challenge and given an opportunity to re-design library organization. Technological developments enabled networking, file storage and graphic user interfaces. This challenge has paved the way for serious thinking on the capabilities to compensate for reduced budgets. LIS professionals need to adapt to the new mindset of users linking new technologies, information, and patrons. The essence of being a library liaison has been defined as one who ‘connects users with their information needs, whatever the format and whatever the technology’.

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4.1 Introduction

The application of ICT with an emphasis on advance computers in the upkeep of library functions such as acquisition, processing (classification & cataloguing), circulation (membership, issue & return of books, CDs etc), periodical management and other maintenance jobs may be termed as library automation. In its strictest sense, it is a device of collecting, storing, processing and transmitting recorded information in print and non print format by using computers and communication technology. Dr Ranganathan stated that a library is a community center, intellectual center, social center and essential part of the society. The better infrastructure like independent library building and comfortable furniture are essential so as to encourage the using of library documents. The interest of users, working hours are also set taking into consideration and professionally qualified staffs and trained library staff who are cooperative and service oriented with the users but in present ICT era only these things are not enough to satisfied the users demand because information has become a resource and it is available in different form and format. In such a situation, the challenges before the libraries are:

- Changes of information needs of the users as they needs of the users as they need information current and fast.
- Change in information habit of the users as the younger users are more comfortable with digital resources than the printed ones.
- Openness of libraries to people, particularly with open public access catalogue, website, blogs, twitter etc so those libraries become more visible "without wall".
- Networking has made possible to expand access to resources.

To cope with above challenges, the libraries now apply the ICT technology and libraries have progresses over the years as a result of PC revolution, high speed LAN, growth of Internet and Internet based services. Keeping above fact in mind, the proper application of ICT in Special Libraries is also essential. An attempt is being made to evaluate the Application of ICT in Special Libraries in Aizawl.

4.2 Data Analysis

The analysis and interpretation of data has been done for the purpose of analyzing the data and arriving at meaningful findings. The analysis has been done in two groups:

1. Application of ICT Technology in Library (Library data);
2. Users view and satisfaction towards ICT application in selected libraries.

Group-A: Application of ICT technology in library (library data)

Table- 4.1.1: Library Collections (Printed Form)

Sl.No	Name 0f the Institution/Organisation	LIBRARY COLLECTION							Total
		Book	Journal		Thesis/ Dissertation	Govt. Publication	Conference Proceedings	Seminar Proceedings	
			Indian	Foreign					
1	ATC	58,766	263	158	93	-	-	-	59,280
2	SYH	5,044	11	11	1	41	0	20	5,128
3	DIET	7,009	-	1	-	-	-	-	7,010
4	AIR	6483	-	-	-	-	-	-	6483
5	ASL	17,000	-	-	-	-	-	645	17,645
6	SCERT	11002	-	9	-	-	-	-	11,011
7	MCON	3030	-	10	12	0	25	50	3,127
9	ATI	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
10	DDK	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
11	RIPANS	13553	-	25	15	-	-	-	13,593
12	VETY	9446	205	52	15	43	52	112	9,925
13	POLY	8138	770	11	-	-	1	25	8,945
14	AICS	18000	-	60	50	120	-	-	18,230
15	NIELIT	7355	-	17	-	-	-	1	7,373
16	IGFAI	12000	500	21	-	50	-	-	12,571
17	NIT	5200	200	-	-	-	-	20	5,420

Table 4.1.1 shows about print collection of selected special libraries. Almost all the library has book collection except 4 libraries (AIR, ATI, DDK, RIPANS). 62% libraries are subscribing Indian journals and 31% libraries are subscribing foreign journals while 38% libraries are not subscribing any journals. 4 (25%) libraries(MCON, College of Veterinary & Polytechnic) having Thesis/ Dissertations, 2 (13%) libraries have Govt. Publications and 50% libraries having Conference/Seminar Proceedings in their print collection.

Table- 4.1.2: Staff Category

Sl. No	Name 0f the Institution/Organisation	STAFF CATEGORY				Total
		Professional	Semi-Profnl	Profnl With IT Competence	Non-Profnl.	
1	ATC	2	3	1	3	9
2	SYH	1	-	-	2	3
3	DIET	1	-	-	-	1
4	AIR	1	-	2	-	3
5	ASL	1	-	-	2	3
6	SCERT	1	-	-	-	1
7	MCON	-	-	-	1	1
8	ATI	1	-	-	1	2
9	DDK	-	-	-	2	2
10	RIPANS	2	-	1	2	5
11	VETY	2	-	-	2	4
12	POLY	2	-	-	1	3
13	AICS	-	-	-	3	3
14	NIELIT	1	-	-	-	1
15	IGFAI	1	-	-	1	2
16	NIT	2	-	-	1	3
17	Total	19	4	4	22	49

Table 4.1.2 exposes the category of library staffs in selected libraries. It resolves that all special libraries don't have sufficient library staff. 50% libraries have only one professional library staffs while 18% library (MCON, DDK and AICS) don't have any professional library staff. Only 5 (31%) libraries (NIT, Polytechnic, College of Veterinary, RIPANS & ATC) have two library professional staffs. In selected libraries only 18% library have Professional with IT Competence.

Table-4.1.3: Parent Organization of the Institution/Organization

Type of Parent Org.	Total Numbers
State Govt.	7 (43.75%)
Central Govt.	4 (25%)
Autonomous Central Govt.	1 (6.25%)
Private Sector	1 (6.25%)
Church Organization	3 (18.75%)
Total	16

Table: 4.1.3 reveals the various types of special libraries in Aizawl are owned by different types of organization and government. A large number of libraries are under the state government there are 7 libraries, 3 libraries are under the church organizations, 5 are central government organizations and 1is private sector organization. Out of these 16 libraries, 2 libraries are established before independence and other are developed after independent.

Table-4.1.4: Staff Qualification

Staff Qualification		
Mlisc	12	75%
BLib	1	6.25%
BA	3	18.75%

Table: 4.1.4 explain that most of the library has professional to take library in-charge, it means that the entire professional are not working as a librarian and some of them are working as assistant librarian or library assistant. Like in The ICFAI University there is no librarian but has library assistant and there is no other library staff. The MCON Library has no librarian, but there is a library in-charge who is appointed from teaching staff or non-teaching staff. A table is given below to show that librarian or library in-charge qualification.

Table-4.1.5: Library Budget

Number of Library	Separate Library Budget
4	Yes (23.53%)
13	No (76.47%)

Figure-4.1.1: Library Budget

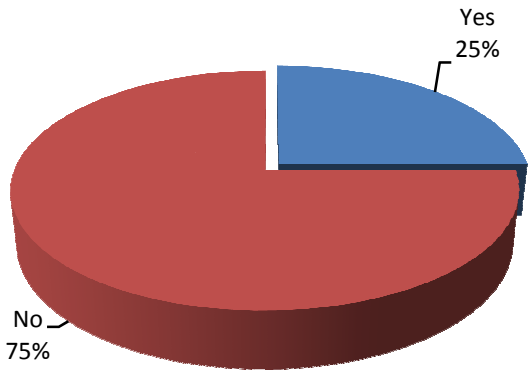

Table: 4.1.5 and figure 4.1.1 shows the Aizawl special libraries have been facing the same problem which is lack of sufficient budget and most of them have no separate library budget. Only 5 libraries such as Aizawl Theological College, Synod Hospital Libraries, Academy of Integrated Christian Studies (AICS), College of Veterinary Sciences & Animal Husbandry (VETY) Library and Assembly House Secretariat Library have separated library. Three of them are under the church organization, one of them is under Central Government and another one is under the State Government that exposes the state government does not pay good attention at library.

Table: 4.1.6: Library collections (non-book materials)

Sl.No	Name 0f the Institution / Organisation	Non-book materials					
		E-book	E-journal		Databases	Audio/ Video cassettes/CDs	Microfilm/ Fiche
			Indian	Foreign			
1	ATC	No	No	No	No	263	52
2	SYH	No	No	No	No	11	No
3	DIET	No	No	No	No	No	No
4	AIR	No	No	No	No	10469	No
5	ASL	Yes	No	No	No	No	No
6	SCERT	No	No	No	No	No	No
7	MCON	No	No	No	No	No	No
8	ATI	No	No	No	No	No	No
9	DDK	No	No	No	No	3500	No
10	RIPANS	No	Yes	Yes	No	715	No
11	VETY	No	Yes	Yes	No	205	No
12	POLY	No	No	No	No	No	No
13	AICS	No	No	No	No	No	No
14	NIELIT	No	No	No	No	No	No
15	IGFAI	No	No	No	No	500	No
16	NIT	No	Yes	Yes	AICTE-INDEST Consortium	200	No

Table 4.1.6 shows about non-book materials of selected special libraries. About 50% of selected special libraries have no collection of non-print materials. Only one library (Assembly Secretariat) has e-book, three libraries (RIPANS, VETY and NIT) have some e-journals. All other special libraries are lacking e-resources. Two libraries (AIR & DDK) are very rich in audio/video cassettes/CDs collection and some other libraries are also having audio/video cassettes/CDs collection and one library (ATC) has microfilm/fiche collection.

Table-4.1.7: Purpose of library consultation by users (N=16)

Sl. No	Name 0f the Library	Transaction of Materials	Reading News-paper	Reading Periodical	Preparing Notes	General Reading	Photo-copying Service	Reference Services	Using Internet	Searching Online Database
1	ATC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	SYH	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
3	DIET	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
4	AIR	Yes	No	No	No	No	No	No	No	No
5	ASL	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	SCERT	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
7	MCON	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
8	ATI	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
9	DDK	Yes	No	No	No	No	No	No	No	No
10	RIPANS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
11	VETY	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
12	POLY	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No
13	AICS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
14	NIELIT	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
15	IGFAI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
16	NIT	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No

Table 4.1.7 shows about the purpose of library consultation by users in selected special libraries. Generally the users of selected libraries visited libraries for transaction of book, reading news papers, reading periodical and preparation of notes. 8 (50%) libraries reported that uses also came for internet and 4 (12.5%) libraries reported that users also visited library for searching online databases.

Table-4.1.8: Search method of books in library (N=16)

Method of books search	No. of libraries	
	Yes	No
Catalogue Card	4	12
OPAC	3	13
Direct Search on Shelves	10	6
Taking Help of Library Staff	5	10

Figure-4.1.2: Searching methods used by users

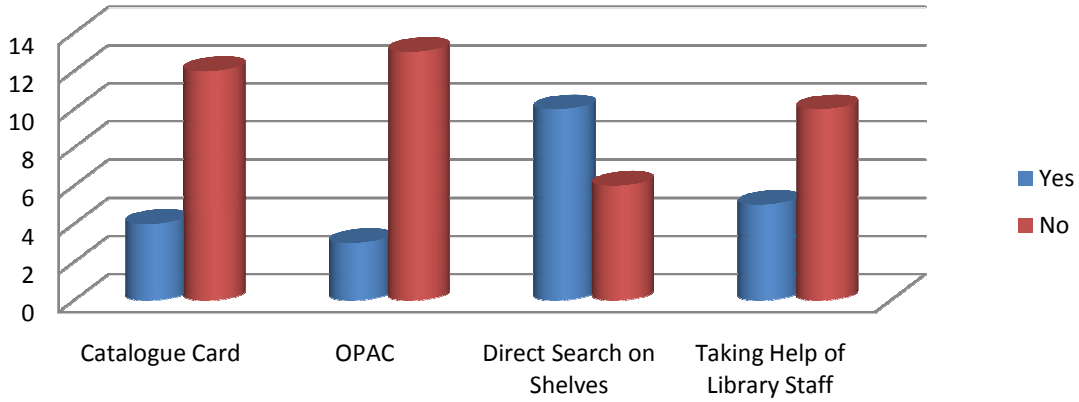

Table 4.1.8 and figure 4.1.2 shows the way of book searching in selected libraries and it was found that only 3 (18%) libraries' users using OPAC for book search because only these libraries are computerized and OPAC services are available for book search. In other libraries, users are searching their book through catalogue card, direct search on shelves and taking the help of library staffs.

Table-4.1.9: Services offered by libraries

Library services	No. of libraries	
	Yes	No
Inter Library Loan	-	16
CAS	3	13
SDI	-	16
Bibliographic Services	-	16
Lending of Periodicals	5	11
Photocopying Service	6	10
Reference Service	8	8
Literature Search	3	13

Figure-4.1.3: Services offered by library

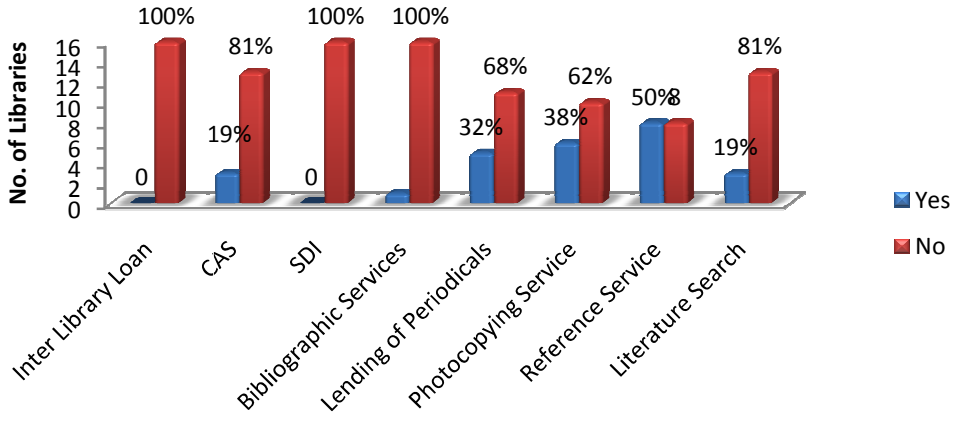

Table-4.1.9 and figure 4.1.3 shows the services offered by selected special libraries under study**.** It was found that no libraries are providing inter library loan services, SDI and bibliographic services; only 18% libraries provided CAS and literature search services and 32% and 38% libraries providing lending of periodicals and photocopy services respectively while only 50% libraries are giving reference services to their users.

Table-4.1.10A: Library automated

Automated library	No. of libraries
Yes	7
No	9

Figure-4.1.4A: Computerizations of library

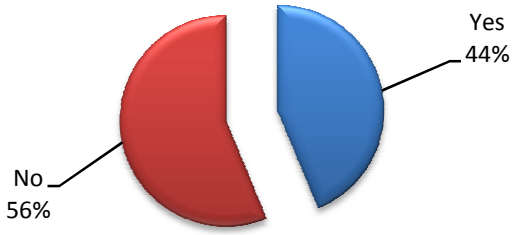

Table-4.1.10B: Level of computerizations (N=7)

Level of computerizations	No. of libraries
Fully Computerized	3
Partially Computerized	3
In Process of Computerizations	1

Figure-4.1.4B: Level of computerizations in library

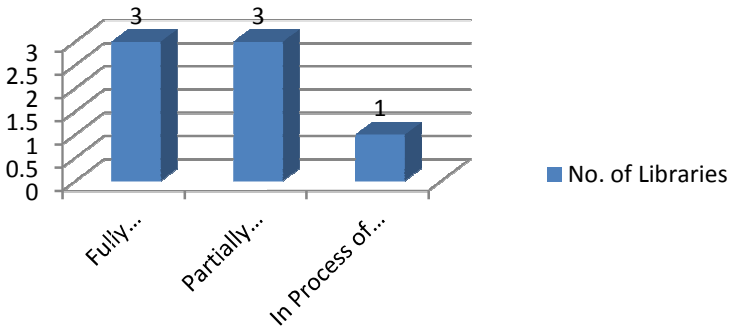

Table 4.1.10A & B and figure 4.1.4A & B show the status of library automation in selected special libraries. If resolved that only 7(44%) libraries are automated and 56% libraries are not automated under selected libraries. Under automated libraries, only 3 libraries are fully automated and 3 libraries are partially automated while one library's automation is going on.

Table-4.1.10C: Sections computerized under partially computerized condition (N=7)

Sections under partial computerization	No. of libraries
Acquisition	4
Circulation	7
Serials	0
Cataloguing	3
OPAC	3

Figure- 4.1.4C: Section computerized (N=7)

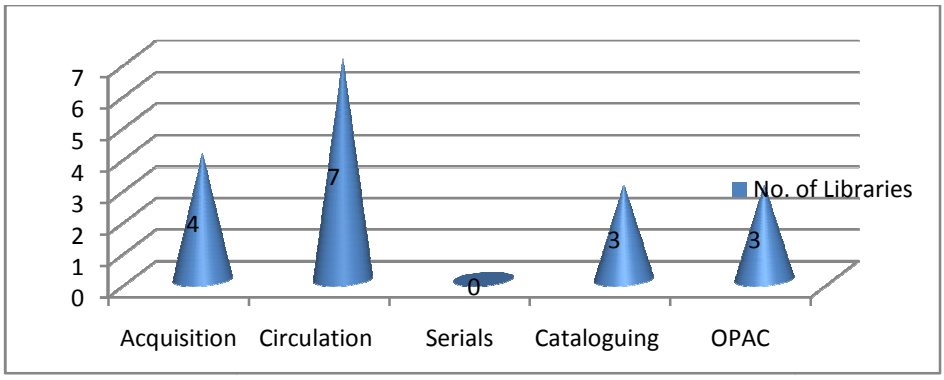

Table-4.1.10C and figure 4.1.4C shows the sections of libraries which are automated. It resolved that under automated libraries(7), all libraries (100%) automated their circulation section, 57% libraries have automated their acquisition section, and 43% libraries make automated cataloguing and OPAC both sections while no any libraries automated their serial section**.**

Table- 4.1.11: ICT facilities used in libraries

Sl. No	Name 0f the library	Introduced barcode technologies	Function activated with barcode technology		Using RFID	Any plan to adopt RFID
			Annual stock verification	Circulation		
1	ATC	Yes	No	Yes	No	Yes
2	SYH	No	-	-	No	Yes
3	DIET	No	-	-	No	No
4	AIR	No	-	-	No	No
5	ASL	No	-	-	No	No
6	SCERT	No	-	-	No	No
7	MCON	No	-	-	No	No
8	ATI	No	-	-	No	No
9	DDK	No	-	-	No	No
10	RIPANS	Yes	No	Yes	Yes	-
11	VETY	No	-	-	No	Yes
12	POLY	No	-	-	No	No
13	AICS	No	-	-	No	No
14	NIELIT	No	-	-	No	Nil
15	IGFAI	No	-		No	Yes
16	NIT	No	-	-	No	Yes

Table 4.1.11 shows that selected special libraries in Aizawl are very unfortunate in regard to use of ICT infrastructure in their library. Only 2 (12.5%) libraries (ATC & RIPANS) are using barcode technology for circulation purpose, while only one library (RIPANS) has RFID technology in library. 31 % librarians shows their interest to use RFID technology in future.

Table-4.1.12A: Internet facilities in the library (N=16)

Internet connection	No. of libraries
Yes	9
No	7

Figure- 4.1.5A: Internet facilities in the library

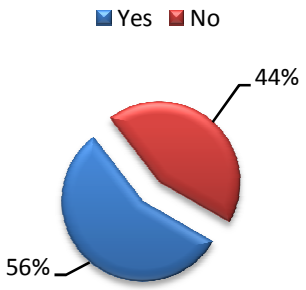

Figure- 4.1.5B: Availability of campus LAN

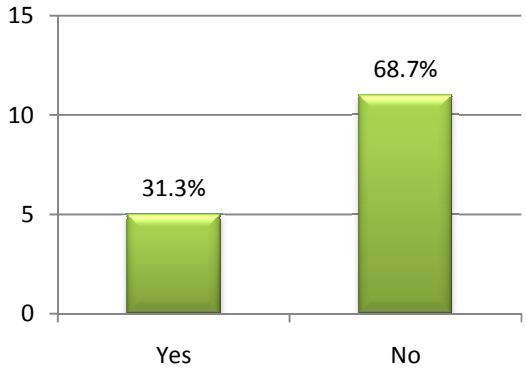

Table-4.1.12A & figure 4.1.5A shows the internet facilities in selected special libraries and it was found that only 56% libraries have internet facilities and 44% of libraries don't have internet connection at all. Figure 4.5B illustrated about availability of LAN facilities and found that only 5(31.3%) libraries have campus LAN facilities but no single library is providing their library resources/databases on LAN. It shows that special libraries in Aizawl are not using ICT tool and services and still they are managing by manual systems.

Table-4.1.13: Membership of library network

Membership of library network	No. of libraries
Yes	0
No	16

Table -4.1.14: Participate in library consortia

Member of library consortia	No. of libraries
Yes	2
No	14

Table- 4.13 and 4.14 shows the status of membership of library network and participation in library Consortia. After analysis it was found that no single library under study are participating in any library network while only 2(12.5%) library are participated in library consortium (ATC library- ATLA, Glob ethics consortium and NIT Library- AICTE-INDEST Consortium).

Table- 4.1.15: Opinion about resource sharing

Is resource sharing essential to minimize the cost of library material?	No. of libraries
Yes	10
No	6

Figure- 4.1.6: Opinion about resource sharing

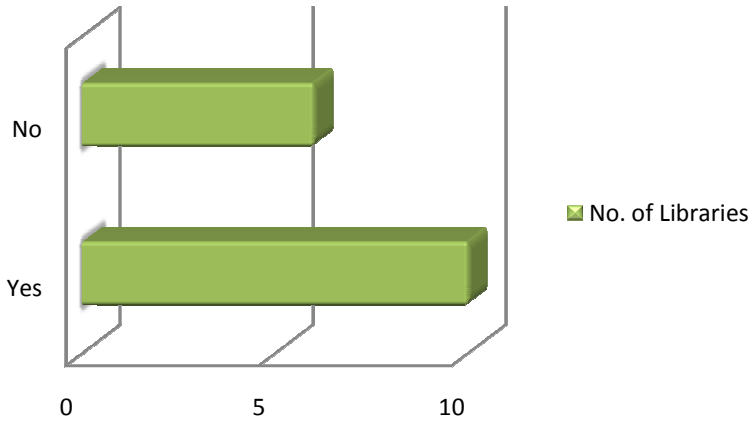

Table-4.1.15 & figure-4.1.6 illustrated the opinion of librarians of selected special libraries about resource sharing. It was found that majority of the librarians (62.5%) feel that resource sharing is essential to minimize the cost of library materials and it is also essential to fulfill the demand of users even then they are not participating in any library network.

Table- 4.1.16: Opinion about ICT application in library

Is library service improved due to ICT application	No. of libraries
Yes	12
No	4

Figure- 4.1.7: Opinion about ICT application in library

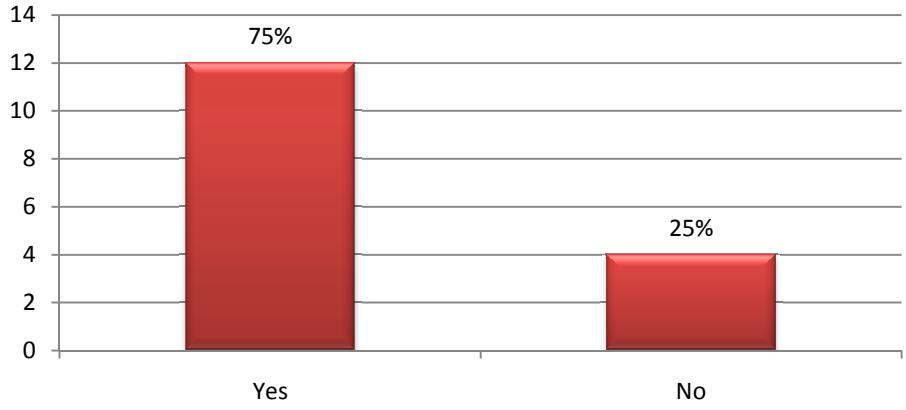

Table-4.1.16 and Figure-4.1.7 illustrates the opinion of librarians of selected special libraries about ICT applications in libraries. Majority of the librarians (75%) feel that only ICT can improve the library services in all aspect. Now a day, we cannot aspect good library services without ICT applications, networking and participation in library consortia even then they are not applied these technology in their library due to some regions.

Table-4.1.17: Awareness program for users

Arranging awareness program for users	No of library	Percentage
Yes	4	25%
No	12	75%

Figure-4.1.8: Awareness program for users

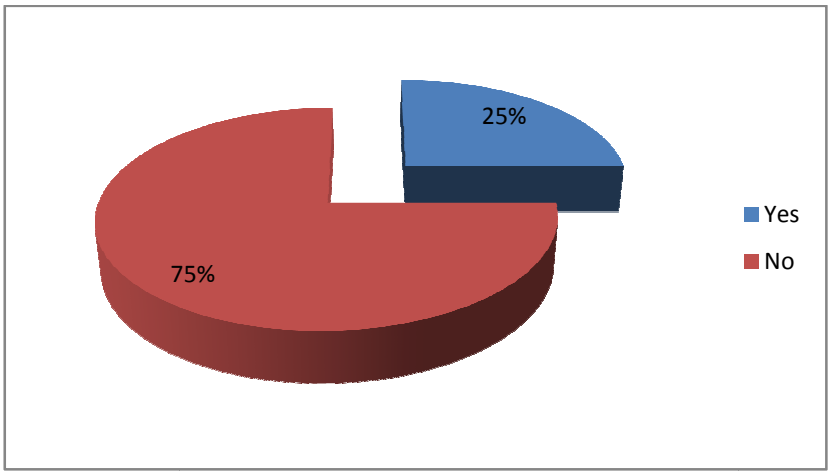

Table 4.1.17 and figure 4.1.8 shows the status of selected special libraries about arranging the awareness program for users so that they and use library resources in appropriate way. Only 24% libraries (ATC, Synod Hospital, DIET and NIT) are providing awareness program for their users at the beginning. Rest other libraries are not providing such type of services to their users.

Table-4.1.18: Training of library staff about latest development in ICT

Training of library staff	No of library	Percentage
Yes	3	19%
No	13	81%

Figure-4.1.9: Training of library staff about latest development in ICT

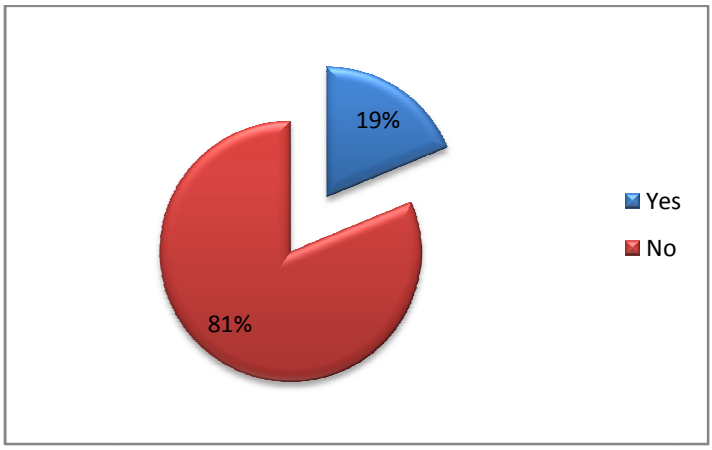

Table 4.1.18 and Figure 4.1.9 show about library staffs training for their awareness and skill development in ICT. It was found that only 3(19%) libraries (Synod Hospital, IGFAI & NIT) have providing the facility to their library staffs to participate different training & workshops, These library also allow their staffs to go outside for different tanning, workshop & seminars etc. to learn about latest ICT technology. Rest other libraries don't have such/facility to their staffs.

Table-4.1.19: Satisfaction with present ICT infrastructure of library

Satisfaction with present ICT infrastructure	No of library	Percentage
Yes	0	0%
No	16	100%

Figure-4.1.10: Satisfaction with present ICT infrastructure of library

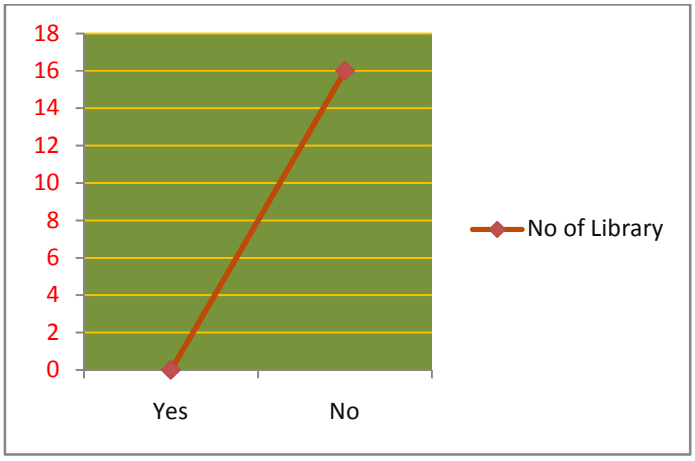

Table.4.1.19 and figure 4.1.10 shows the satisfaction of library staffs towards present ICT infrastructure available in library. It was found that all librarians are not satisfied with present ICT infrastructure available in library. Some librarians were saying that there were no ICT infrastructures in their libraries and they are managing library somehow with manual system.

Group-B: Users view and satisfaction towards ICT application in selected libraries

Table–4.1.20: Users age groups

User age group		
Age	Total	Percentage
15-20	44	35.48%
21-26	41	33.06%
27-32	21	16.94%
33-38	4	3.23%
Above 39	8	6.45%
Nil	6	4.84%
Total	124	100%

Figure-4.1.11: Users age groups

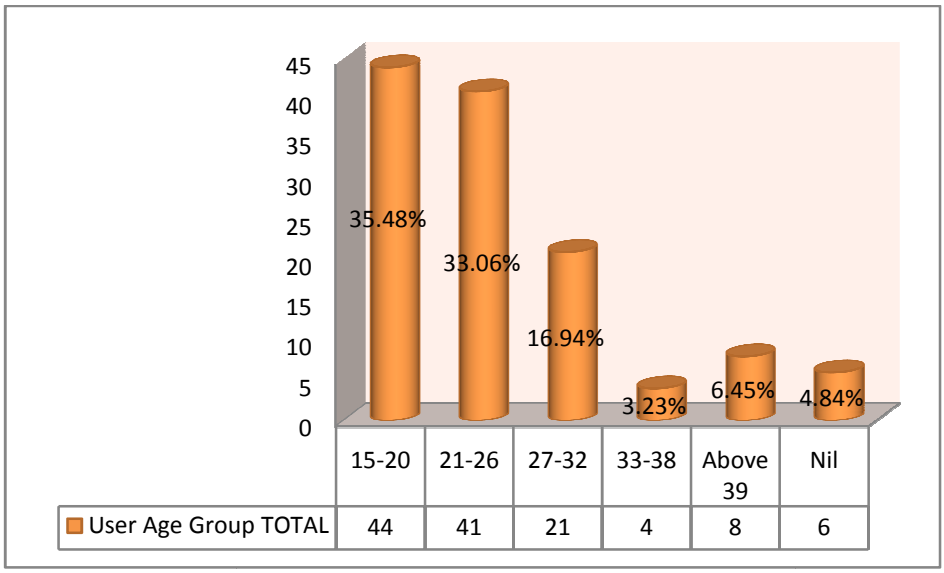

Table 4.1.20 and figure 4.1.11 shows about users age groups of selected special libraries. It was found that maximum users are fallen under the age group of 15-22 years (35.48%), 33.06 % users are between the age group of 21-26, 17% are between 27-32 years. Only 6.45 % library users in selected special library are above than 39 years while 5% users were not provide data related to their age. It shows that selected special libraries users are very young.

Table-4.1.21: Gender-wise distribution of respondents

User gender		Percentage
Male	60	48%
Female	64	52%
Total	124	100%

Figure-4.1.12: Gender-wise Distribution of Respondents

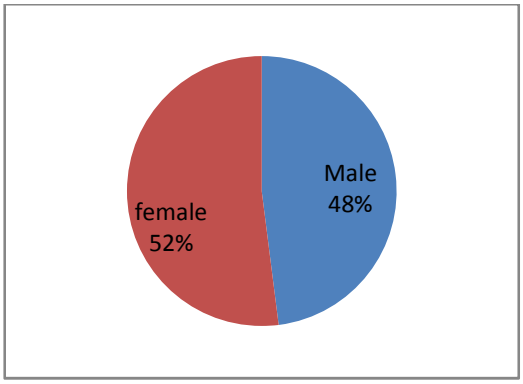

Table 4.1.21 & figure 4.1.12 are listed the gender wise distribution of users in selected special libraries who has been taken for the study and it was found that 54% of respondents are male and 46% are female.

Table-4.1.22: Frequency of library visit of users

Frequency to visit library	No of users	Percentage
Daily	46	37.10%
Weekly	45	36.29%
Monthly	5	4.03%
Occasionally	25	20.16%
Nil	3	2.42%
Total	124	100%

Figure-4.1.13: Frequency of library visit of users

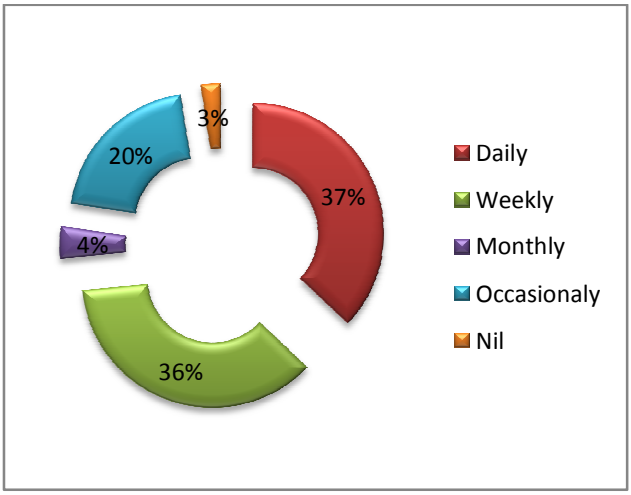

Table 4.1.22 and figure 4.1.13 shows the frequency of library users in selected special libraries. It was found the 37% library users are regular users of the library and 20% users are occasionally visited the library. 36% user visited library weekly and 4% uses monthly visited their library, while 3 % users are not giving their frequency to library visit. It shows that selected users are not visited their library regularly.

Table-4.1.23: Opinion of users about library resources

Adequate Resources	No. of Users
Yes	68
No	51
Data not given	5
Total	124

Figure-4.1.14: Opinion of users about library resources

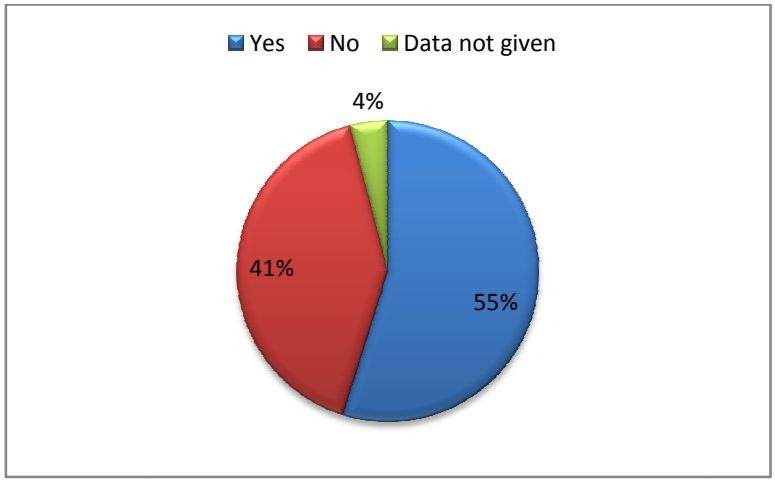

Table 4.1.23 and figure 4.1.14 shows the opinion of users about library resources. It was found the 55% library users are satisfied with library resources while 41% library users are not satisfied with present library resources and they feel that resources should be improve. This is may be the one reason that 60% of library users are not visited their library regularly.

Table-4.1.24: Way of getting information

Ways of Getting Information	No. Of Users
Internet	49
Intranet	0
Some Other Library	4
Personal Collections & Efforts	53
Data Not Given	18
Total	124

Figure-4.1.15 Way of getting information

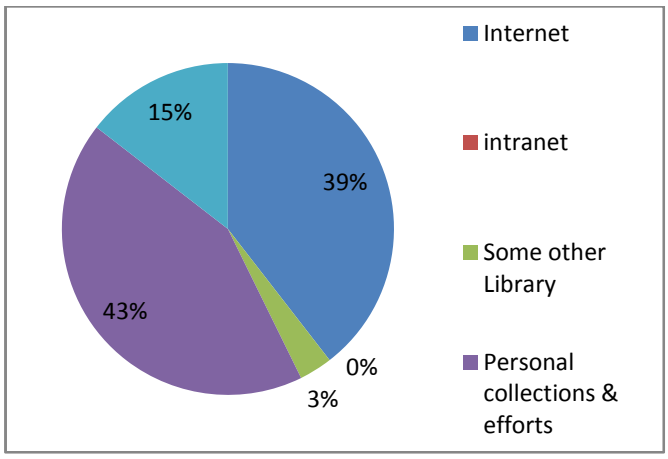

Table 4.1.24 and figure 4.1.15 reveals the way of getting the information if users are not visited library or they feel that there are no sufficient resources. After analysis it was found that majority of the users (43%) are getting the information from their personal collections or efforts while 39% users getting the information from internet which shows their interest towards internet and 3% users visited some other library to get their information.

Table- 4.1.25: Type of resources used by users in library

Resources Used by the Users	No
Print sources	92
Print sources, Online Sources	7
Online Sources, Web Sources	2
Print Sources, Online Sources, Web Sources	8
CD/DVD/Cassettes'	8
Data not given	7
Total	124

Figure-4.1.16: Type of resources used by users from library

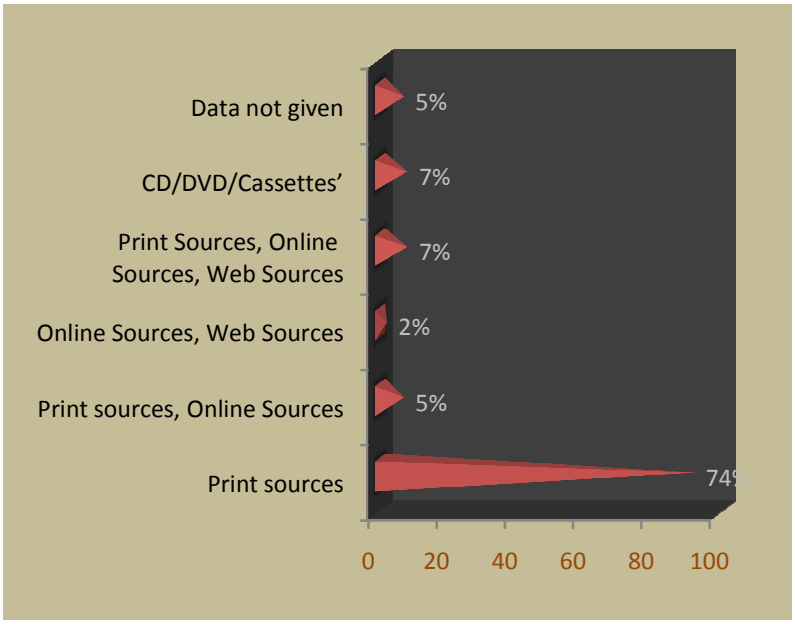

Table.4.1.25 and figure 4.1.16 shows the type of resources used by users. It was found that majority of the users (74%) are using print resources only to fulfill their information need from library. The main motive behind it that majority of special libraries in Aizawl having print resources only and they were not automated and don't have ICT based e-resources. Only 2% users are using online web based resources and7% users are using print as well as online resources (these users were belong to only two libraries i.e. ATC & NIT). 7% users are used CD/DVD/cassettes for their information needs (these users were belong to only two libraries i.e. DDK & AIR).

Table-4.1.26: Uses of OPAC/web OPAC facilities by users

Using OPAC/web OPAC	No. of users	Percentage
Yes	20	16%
No	104	82%
Data not given	2	2%
Total	124	100%

Figure-4.1.17: Uses of OPAC/web OPAC facilities by users

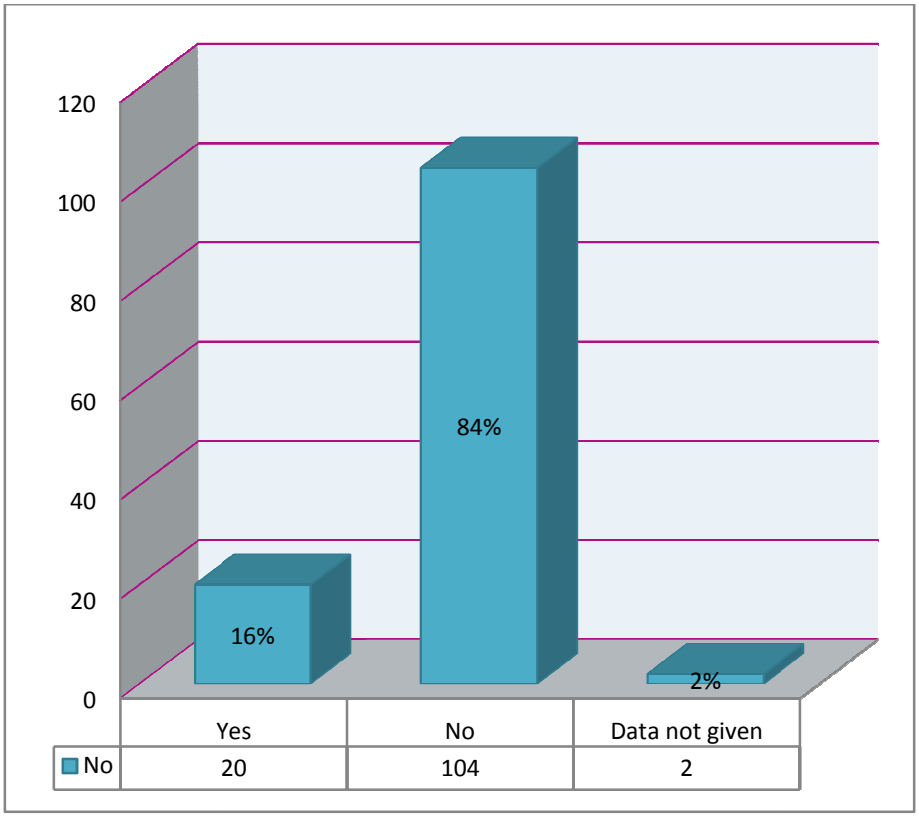

Table 4.1.26 & figure 4.1.17shows the uses of OPAC/web OPAC facilities to search their information. It was found that only 16% of users used OPAC facilities to search library materials while 82% users were not used such facilities. The reason behind it was that the maximum selected libraries are not automated till date.

Table- 4.1.27: Availability of Internet services

Availability of Internet services	No. of users	Percentage
Yes	17	14%
No	107	86%
Total	124	100%

Figure- 4.1.18: Availability of Internet services

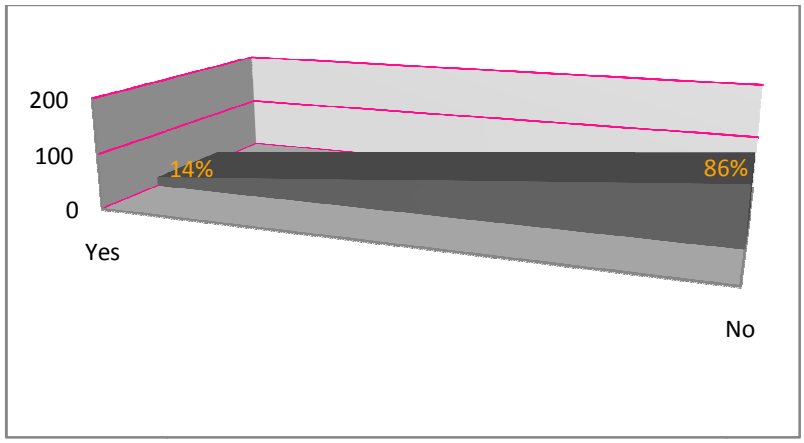

Table 4.1.27 and figure 4.1.18 shows the availability of Internet for users. It was found that only 14% of users said that internet is available for them and 86% uses said that internet facilities are not available for them and they used internet facilities outside the library if it required. The reason behind it was that the maximum selected libraries have no internet connection till date.

Table-4.1.28: Satisfaction with Internet facilities (N=17)

Satisfied	No	Percentage
Yes	3	18%
No	14	82%
Nil	17	100%

Figure-4.1.19: Satisfaction with Internet facilities (N=17)

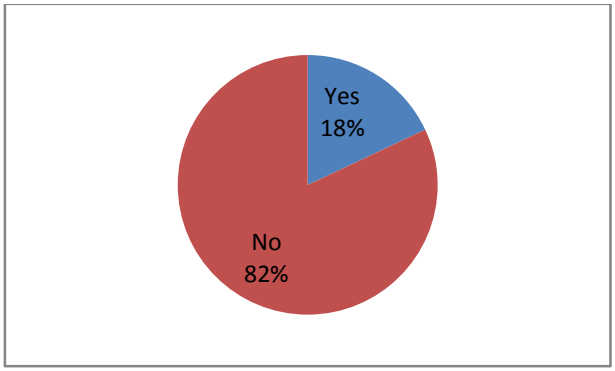

Table 2.1.28 and Figure 4.1.19 show the level of satisfaction with internet services provided by selected special libraries under study. It was found that majority of the users (82%) are not satisfied with Internet due to slow speed, less number of terminals, provided limited time for access etc. On the basis of that, we can say that special libraries don't have good internet services for users.

Table-4.1.29: Availability of e- resources

Availability of e-resources	No	Percentage
Yes	15	12%
No	109	88%
Total	124	100%

Figure-4.1.20: Availability of e- resources

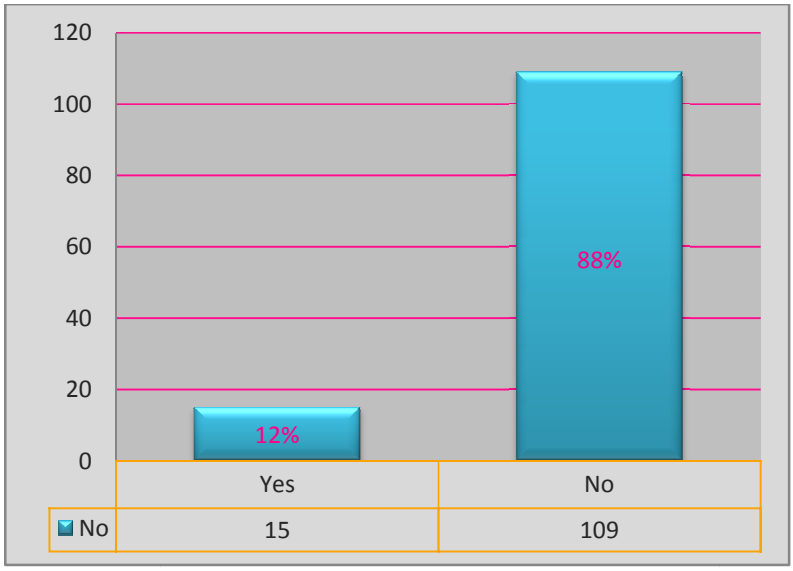

Table 4.1.29 & figure 4.1.20 show the opinion of users about availability of e-resources (e-book, journals & databases) in selected special libraries and it 88% user reported that their libraries don't have any e-resources. Only 12% users are reporting that their libraries have e- resources and these users are belong to only two libraries i.e. NIT & Veterinary.

Table-4.1.30: Training program regarding use of e-resources

Getting Training Program	No.
Yes	0
No	124

Table-4.1.30 shows users opinion about training program regarding use of e-resources for users and it was found that all special libraries under the study were not providing any training program for use regarding use of e-resources. Regions are behind it that almost all libraries don't have e-resources.

Table-4.1.31: ICT infrastructure with libraries

Adequate ICT Infrastructure	No.	Percentage
Yes	6	5%
No	118	95%
Total	124	100%

Table-4.1.31 shows the users opinion about availability of ICT Infrastructures of libraries and 95% users reported that their library are lacking adequate ICT infrastructure and they are managing library services without using ICT tools and services.

Table-4.1.32: ICT infrastructures should be improved in libraries?

Opinion of Users	No.	Percentage
Yes	121	98%
No	3	2%
Total	124	100%

Table-4.1.32 shows the users opinion about improvement in ICT Infrastructures of libraries and 98% users feel that ICT infrastructures should be improve in library so that they will get good library services.

Table-4.1.33: Suggestion To improve ICT service in library

Sl. No.	Users suggestion to improve ICT service in library	No.
1	Internet facilities	115
2	Fully computerization	92
3	E-learning facilities	90
5	Sufficient Collection	94
6	Sufficient trained staffs	108
9	More ICT Facilities	119
10	Photocopying Service	97
11	More Computer	109
12	Training Program on ICT facilities	112
14	Training Program regarding e-resources	116

Table 4.1.33 shows the users opinions and suggestions about improvement of ICT applications in their libraries and it was found all most all library's users want that their library should improve in computerization of library, Internet facilities, e-learning facilities, more ICT facilities, more computers and proper training program about ICTs facilities and use of e-resources. These opinions and suggestions shows that users of special selected libraries are very much familiar with ICTs but there were no applications of these ICTs in their libraries and they hope that in near future it may be apply in his library and situation will be change.

4.2 Findings

The study was started with intention to find out the application of ICT in special libraries in Aizawl. To achieve the objectives the whole study was divided in two parts (1) Findings from Libraries about ICT application in their libraries and (2) Findings from users about ICT uses in their libraries. The data for study was collected using questionnaires as a tool and after analysis important findings of the study are listed below:

(2) Findings from Libraries about ICT application in their libraries

- All the special libraries were facing huge problem regarding library staffs. Almost all the libraries were lacking professional library staffs and only very few libraries have one or two staff/s that were also not very much outfitted with ICT tools and even some libraries were running without any professional library staff.
- Maximum libraries were also facing huge problem regarding library budget. They don't have separate library budget and they depend upon the parent organization leniency for fund to manage their routine activity. For automation and networking they required extra fund, which was not given by parent organizations.
- From the analyzed data it can be concluded that all special libraries of Aizawl were using print collections (like books, journals etc) and even many libraries were not subscribing journals too. It means that they were not keeping the primary source of information. Only very few libraries having thesis/dissertation and government publications. It shows that special libraries don't have proper ICT based collections.
- Special libraries of Aizawl are very much deprived in non-print collections. It is observed that only NIT Mizoram has e-journals and databases through INDEST consortium, Assembly Library has 10 e-books and AIR and DDK libraries have large number of audio/video cassettes/CDs as their collection while some other libraries have only few audio/video cassettes/CDs as a non print document.
- The maximum users came to library for only transaction of books, reading newspapers, photocopy services, reference service etc. because libraries were providing only these traditional services.
- Only 24% libraries (ATC, Synod Hospital, DIET and NIT) were providing awareness program for their users at the beginning to maximize the use of library resources. Rest other libraries were not providing such type of services to their users.
- The services provided by special libraries were appeared very traditional. The library services like internet and online databases were provided by very few libraries. Even the internet connection was available at some libraries but internet based services were not given to the users. Only 5 libraries have campus LAN facilities but no single library is providing their resources/databases on LAN. It shows that special libraries in aizawl were not using ICT tool and services and still they were managing by manual systems of library management only.

- Approximately 56% libraries were not automated and manage by manual system. Only 3 libraries were fully computerized, 3 were partially computerized and one library was under automation process. Under automated libraries (7), all were using automated circulation section, 4 have automated acquisition, and only 3 have automated cataloguing and OPAC system which show their very unfortunate response towards automation.
- The selected special libraries in aizawl were not in good position in regard to use of ICT infrastructure in their libraries. Only 2 libraries (ATC & RIPANS) are using barcode technology for circulation purpose, while only one library (RIPANS) has RFID technology.
- No single library under study was participating in any library network while only 2 libraries were participated in library consortium. The majority of the librarians (62.5%) believe that resource sharing is essential to minimize the cost of library materials and it was also essential to fulfill the demand of users even then they were not participating in any library network.
- Majority of the librarians (75%) feel that ICT improve the library services in all aspect. Now a day we could not aspect good library services without ICT applications, networking and participation in library consortia even then they are not applied these technology in their library due to some reason.
- It found that only 3(19%) libraries (Synod Hospital, IGFAI & NIT) were providing the facility to their library staffs to participate different training, workshops, These libraries also allow their staffs to go outside of state for different tanning, workshop, seminars etc. to learn about latest ICT tools & technology. Rest other libraries were not providing such facility to their staffs.
- It was found that all librarians were not satisfied with present ICT infrastructure available in library. Some librarians told that there were no ICT infrastructures in their libraries and they are managing library somehow with manual system.

(2) Findings from users about ICT uses in their libraries

- From the users data analysis it was found that users were very young in selected special libraries and they were fallen under the age group of 15-22 years (35.48%), 33.06 % users are between the age group of 21-26, 17% are between 27-32 years. Only 6.45 % library users in selected special library were above than 39 years. They were very much familiar with ICT tools and services and they were willing to use ICT based library services even then presently they were not able to use these tools.
- Only 37% of library users were regular users and came to library regularly and rest 63% users were not regular users because all selected libraries have only traditional documents and maximum users came for issue and return of books. If libraries want to make them regular then they have to provide better ICT based library services so that they can attract toward library.

- About 50% users were not satisfied with their library resources. This may be the one cause that 60% of library users were not visited the library regularly. They feel that resources should be improved and electronic resources should be added in collection so that they can get update information in their field.
- Majority of the users (74%) were using print resources only to fulfill their information need from library. The main reason behind it that majority of special libraries in Aizawl were not automated and they did not have e-resources. Only 2% users were using online web based resources and 7% users were using print as well as online resources. 7% users were used CD/DVD/cassettes for their information needs.
- About 43% of the users got the latest information related to their study from their personal collections or efforts; 3% users visited some other libraries and 39% users get the information from internet which shows the interest of users toward ICT while maximum libraries did not provide Internet services.
- Only 16% of users used OPAC/web OPAC facilities to search their information in selected libraries. The ground behind it was that the maximum selected libraries were not automated yet.
- Majority of the users (86%) said that internet facilities were not available for them and they used internet facilities outside the library if they required. The explanation behind it was that the maximum selected libraries have no internet connection till date.
- In seven selected libraries where internet service were given to users, majority of the users (82%) were not satisfied with Internet services due to slow speed, less number of terminals, provided limited time for access etc. On the basis of this, it can summarize that special libraries have no good internet services for their users.
- The selected special libraries were lacking the training program regarding use of e-resources for users and were not providing any training program for user regarding better use of e-resources of libraries.
- About 95% users feel that their library were lacking adequate ICT infrastructure and library were managing library services without ICT tools and services and 98% users demanded that ICT infrastructures should be improve in library so that they will get good library services.

5.1 Conclusion

The special libraries are the energy of their parent organizations/ institutions likewise those special organizations/institutions are the core organizations to the socio-economic development of the state as well as country. So, it should be given very much importance and cannot be neglected for any where because it is a part of our faces regarding development. It means that special libraries are developed for our society with aim and objective of their parent organizations to lift up our culture and improve our socio-economic status to share their abilities with the world through providing special and technical knowledge. The main purpose of special libraries are to provide up-to-date right information to the people who are associated with these library to support their education and research and assist to accomplish the aim and objectives of organizations because special institutions are setup with special aim and objectives. The main goal of libraries is to provide an effective combination of print, non-print and electronic resources and integration of the use of these resources in learning and research process of organizations. Application of ICT in libraries has become inevitable in an era of information explosion and widespread use of digital information resources. Effective applications of ICT in libraries help in performing their operations and services effectively and efficiently. Special libraries have wide range of opportunities and variety of challenges offered by rapid development and wide application of ICT. As the new technology provides librarians with new choices, new opportunities and new challenges and there has a phenomenal progress in the use of ICT applications in libraries in rest part of country as well as world. The success of automation and application of ICT in libraries is mainly depending upon the availability of competent library professional in using new technology.

Library professional should be provide adequate training to have through understanding and knowledge of the ICT skills but unfortunately the special libraries were lacking these aspect because they have no ICT trained library staffs. Almost all libraries are running without proper trained library staff and some are running without library staffs. Without suitable manpower, we cannot assume good services.

The ICT based library services are not reaching to the users of special libraries and in very few libraries, which are automated and providing ICT based services are also did not expected extent and unsatisfactory. Maximum libraries under the study are still not automated and run through manual system due to inadequate finance, inadequate infrastructure and inadequate trained library professionals. Most of the special libraries were struggling to introduce to introduce ICT based library resources and services in their libraries. Some libraries had very inadequate IT infrastructure and ICT based electronic resources and still they were dealing with only print collections and their services were limited up to issue and return of books. Due to limitation of library services to issue and return of book only, the library users were also did not visited their libraries regularly.

The majority of special libraries in Aizawl use traditional method to run library management and services. Majority of the users said that internet facilities were not available for them in the library and they used internet facilities outside the library if they required because the maximum selected libraries have no internet connection. No single library under study was participating in any library network while only 2 libraries were participated in library consortium while it believe that resource sharing is essential to minimize the cost of library materials and it is also essential to fulfill the demand of users in present ICT era.

Thus, it can be concluded that ICT based sources and services of the majority of libraries were vey poor and inadequate many of librarians and almost all users were not satisfied with application of ICT in their libraries and indicated inadequate ICT infrastructure and lack of electronic resources and lack of ICT trained library staffs as their main reason for dissatisfaction. The findings of this study have provided useful insights for special libraries in aizawl to take appropriate strategies in a rational and systematic manner to increase the use of ICT for library operations and services.

5.2 Suggestion

The study includes sixteen special libraries in Aizawl and they are not completely adequate in the application of ICT in their libraries. There are many things to be improved and to be put step forward in case of ICT application and library management. Based upon the study, the following suggestions are recommended:

- Libraries should have separate building with sufficient separate reading rooms. It should have separated library budget also to provide sufficient library and information services.
- Professionally trained library staffs may appointed in all special libraries with technical supporting staff so that they can develop library in professional way.
- All libraries should be computerized to enhance the library services and all resources should be available on OPAC/web OPAC so that users can easy search their information and library personnel need to be well acquainted with latest ICT techniques.
- Libraries need better funding to give more productive and effective information resources and services. In order to access electronic resources like e-journals, e-book and databases, sufficient amount of money is needed. Therefore adequate funds should be made available by the authorities for procurement of digital resources and improvement in library collection by application of ICT.
- Libraries should participate in some Library network (like- DELNET, INFLIBNET) for resource sharing and they can also participate in some library consortia (like INDEST, UGC-INFONET, CSIR etc) to enhance their e-resources in minimum cost.
- Libraries should have state-of-the art infrastructure including hardware, software, and human resources. They should adopt sufficient hardware like servers, computer terminals, printers, scanners, barcode scanners, data capture unit, CD-writers, DVD drives, VCD players, UPS, etc. and should be maintained properly.

- All libraries should connect with high speed internet connection and appropriate number of terminals may be provided to users for use of internet.
- Campus of the organization should be connected through LAN and all library resources should be available on LAN so the users can easily access information from any corner of institute.
- Library professionals should also have skills to handle ICT products, particularly library management software, operating system, telecommunication products, DBMS, data and file management, word processing, etc. They should have skills to apply ICT for service management in general and information processing, search and retrieval.
- In fast changing ICT environment, there is a need of training and professional development attitude. Therefore, all library staffs should go on proper library training/workshop in definite interval to keep them update.
- Libraries should promote ICT awareness program by organizing workshops, seminars, conferences, and special lectures to the users so that they can aware about better use of ICT in getting their information.

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APPENDIX

A. Questionnaire For the Staff

APPLICATION OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN SPECIAL LIBRARIES IN AIZAWL: A STUDY

Sir/Madam,

I am pursuing Mphil in Library & Information Science, Mizoram University, Aizawl. As a component of the syllabus, I have to submit my dissertation on the above mentioned topic under the guidance of Dr. Manoj Kumar Verma. You are requested to fill up the questionnaire, which will be used for academic purpose only.

(Please answer the question or tick mark in the box provided against each question)

R. Lalrohlui
Mphil Scholar
Mizoram University

A. General Information

- Name of the correspondent_____
- Designation of the correspondent_____
- Sex: Male ( ) Female ( )
- Age:_____
- Name of the institution/organization_____
  _____
- Year of establishment:_____
- Which type of institution/organization?
  a) State Government ( ) b) Central Government ( ) c) Semi Government ( )
  d) Autonomous [State Govt.] ( ) e) Autonomous [Central Govt.] ( ) f) Public Sector ( )
  g) Private Sector ( ) h) Others_____

B. Information about Library

- Do you have Library Website: Yes ( ) No ( )
- Does library have separate library building? Yes ( ) No ( )
- Citing capacity of Library:_____
- Working hours of Library:_____
- Name of The Librarian/In charge: Dr./Professor/ Mr/Ms/Mrs_____

Qualification: a) Academic_____

b) Professional/technical_____

- No of Staffs in Library:

Sl.No	Category of staffs	Total No
1.	Professional	
2	Semi- Professional	
3	Professional with IT Competence	
4	Non -professional	

C. Budget (Annual)

- Is your library having a separate budget? Yes/No

If yes, please give the details:

Year	Total Library Budget	Breakup of Library Budget under various heads						
		Books	Journals		Non Book Materials including AV	IT Equipments	Furniture/ other equipments	Others
			Printed	Electronic				
2012-13								
2011-12								
2011-10								

D. Status of Library Collection and Services:

- **Book form (please give the number only):**
  - **a)** Books
    - i) General books_____ ii) Text books_____
    - iii) Reference books_____ iv) Book bank_____
  - **b)** Journals
    - i) Indian_____ ii) Foreign_____
  - **c)** Thesis/ Dissertations_____
  - **d)** Government publications_____
  - **e)** Conference/Seminar proceedings_____
  - **f)** Standards_____
  - **g)** Patents_____
  - **h)** Manuscripts_____
- **Non book materials**

  a) Audio/Video cassettes/CDs _____ b) Microfilm/Fiche_____

- **E- materials:**

  a) E-books_____ b) E-journals: i) Indian_____ ii) Foreign_____

  c) Databases (kindly attach a list) _____

E. Library Services

- Methods of access the library: Open ( ) closed ( )
- Does your Library stock is arranged according to class number? Yes ( ) No ( )
  If yes, which classification scheme is followed: DDC ( ) UDC ( ) CC ( )
- User consults your Library for (please put tick mark):
  a) Transaction of books: Yes ( ) No ( )
  b) Reading news papers: Yes ( ) No ( )
  c) Periodicals/journals: Yes ( ) No ( )
  d) Preparing the notes: Yes ( ) No ( )
  e) General reading: Yes ( ) No ( )
  f) Photocopy services: Yes ( ) No ( )
  g) Reference services: Yes ( ) No ( )
  h) Internet use: Yes ( ) No ( )
  i) Searching on-line databases: Yes ( ) No ( )
- How users search the books in your library? (please put tick mark):
  a) Through Catalogue card ( ) b) Through OPAC ( )
  c) Direct search on Shelves ( ) d) Search with the help of Library staff ( )
- Library circulation system (please put tick mark):
  a) Computerized ( ) b) Manual ( ) c) Both method ( )
- Services offered by your library (please put tick mark):
  a) Inter library loan: Yes ( ) No ( )
  b) CAS: Yes ( ) No ( )
  c) SDI: Yes ( ) No ( )
  d) Bibliographic services: Yes ( ) No ( )
  e) Lending of periodicals: Yes ( ) No ( )
  f) Photocopy services: Yes ( ) No ( )
  g) Reference services: Yes ( ) No ( )
  h) Literature search: Yes ( ) No ( )
- Is your library using FRID technology? Yes ( ) No ( )
  If no, is there any plan to adopt FRID technology In future? Yes ( ) No ( )

E. Library Automation and Resource Sharing

- Your library is Automate: Yes ( ) No ( )
  If yes, which software do you used?

  _____

  Year of automated_____

If no, what is the
reasons_____
_____
_____
_____

- Level of Computerization:
  a) Fully ( ) b) partially ( ) c) in Process of Computerization ( )

  If your answer is b, then which section is computerized?

  a) Acquisition ( ) b) Circulation ( ) c) Serial Control ( )
  d) Cataloguing ( ) e) OPAC ( )

- Whether your library has introduced barcode technology? Yes ( ) No ( )

  If yes, please mention the functions activated using barcode technology (please put tick mark)
  a) Annual stock verification ( ) b) Circulation ( ) c) Any other ( )

- For Library Automation which funding agency provide financial support:-
  _____
  _____

- Does your library have internet connection? Yes ( ) No ( )
  If yes, Internet connection is used for:
  a) Office work ( )
  b) Searching information by students ( )
  c) Searching online databases ( )
  d) Resource sharing ( )
- No. of PC's having internet connection in the library: _____
- Type of internet connection:
  a) Dial-Up ( ) b) Leased line ( ) c) V-set ( )
  d) Cable network ( ) e) wireless network ( )
- Internet connection speed_____
- Do you charge any amount from users for internet services? Yes ( ) No ( )
  If yes, how much?
  _____
- Does your Institute have campus LAN? Yes ( ) No ( )
  If Yes, All e-resources/databases are available on LAN? Yes ( ) No ( )
- Is your Library a member of any library networks? Yes ( ) No ( )

If yes, (please specify):

a)_____

b)_____

c)_____

- Does your library participate in any library consortia for resource sharing?
  Yes ( ) No ( )

  If yes, (please specify):

  a)_____

  b)_____

  c)_____

- Do you feel a consortium is very much useful for resource sharing? Yes ( ) No ( )

  If yes, how?

  a)_____

  b)_____

  c)_____

- Do you feel that resource sharing is essential to minimize the cost of library material?
  Yes ( )No ( )
- Do you feel that your library services have been improved due to IT applications?
  Yes ( ) No ( )

F. Human Resource Development and Library Management

- Do you arrange any awareness programme for users about library? Yes ( ) No ( )
- Do you feel that the library staffs are skilled enough to meet the user's needs in present IT Environment? Yes ( ) No ( )

  If no, why? a) _____

  b) _____

  c) _____

- Do you have any programme to train the library staff about the latest development in IT?
  Yes ( ) No ( )

  If yes, how?

  a) By sending them outside ( )

  b) Organizing a workshop/ training inside the Institute ( )

- Are you satisfied with the application of ICT in your library: Yes ( ) No ( )
  If no, give any reasons _____
  _____
  _____
  _____
  _____
  _____
- Future plan for ICT based application services in your library
  _____
  _____
  _____
  _____
  _____
  _____
- Any suggestion in implicating ICT to improve your library
  _____
  _____
  _____
  _____
  _____

Thank you for your kind cooperation.

Signature with date

[Note: Please use separate sheet if you want to give any more relevant information about your library]

B. Questionnaire for the User

APPLICATION OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN SPECIAL LIBRARIES IN AIZAWL: A STUDY

Sir/Madam,

I am pursuing M. Phil in Department of Library and Information Science, Mizoram University, Aizawl. As a component of the syllabus, I have to submit my dissertation on the above mentioned topic under the guidance of Dr. Manoj Kumar Verma. You are requested to kindly fill up this questionnaire, which will be used for only academic purpose.

(Please answer the question or tick mark in the box provided against each question)

R. Lalrohlui
Mphil Scholar
Department of Library & Information Science
Mizoram University, Aizawl

A. GENERAL

- Name of the Respondent…….....
- Designation……
- Affiliation…….…….
- Age……
- Sex: Male ( ) Female ( )

B. Library & Its Collection

- How long are you using the library? Please mention the year……..
- Do you feel the library has adequate resources? Yes ( ) No ( )
- Frequency of visit the library

  a) Daily ( ) b) Weekly ( ) c) Monthly ( ) d) Occasionally ( )

- If you do not visited the library at all then please mention the way to access the resources

  a) Intranet ( ) b) Internet ( ) d) Department Library ( )

  Others (if any)……

- Purpose of visiting the library:

  a) To borrow books ( ) b) To study ( ) c) To read Periodicals ( )

  Others (pl. Specify)……..

- How useful do you find the library:

  a) Useful ( ) b) Very Useful ( ) c) Not at all ( )

- What kind of sources you frequently use from Library:

  a) Print sources ( ) b. On-line sources ( ) c) Web sources ( )

  d) CD-ROM ( ) e) DVDs ( ) f) Bulletin Board ( )

  g) Others (pl. specify)…….

C. ICT Application in Library Services & Collection

- Is the Library Automated? Yes ( ) No ( )
  If Yes, Then status-
  a) Fully ( ) b) Partial ( ) c) In process of computerization ( )
- How does the Automation Process help you in getting required information/ resources?

  a) Adequate ( ) b) Not adequate ( ) c) Manageable ( )

  If no, specify the reasons.

  a) ……
  b) ……
  c) ……
- Does the library provide OPAC /Web OPAC services? Yes ( ) No ( )
- Do you have computerized security system in the library? Yes ( ) No ( )

  If yes, please mention the type of security…….

- Does the library provide internet facilities for the users: Yes ( ) No ( )
- Are you satisfied with internet services provided by the library? Yes ( ) No ( )
  If No, Specify the regions
  a) ……
  b) ……
  c) ……

- Does the library provide e-resources service? Yes ( ) No ( )

If yes, please mention the type of e-resources

a) e-book ( ) b) e-journal ( ) c) e-encyclopedia ( )
d) e-report ( ) e) any other……..

- Does the library provide consortia services? Yes ( ) No ( )
  if yes, please mention the name of consortia
  a) ……
  b) ……
  c) ……
- Which awareness are you approaches to e-resources?

  a) Through membership ( ) b) Through Library website ( )

  c) Through information broacher of Library ( ) d) Through friends/colleagues ( )

  e) Through library staff ( )

- Do you encounter any problem in accessing the resources or handling the equipment? Yes ( ) No ( )
  if yes, do you get sufficient support from the library staffs Yes ( ) No ( )
- Do you feel that library possess adequate Information and Communication technology (ICT) infrastructures? Yes ( ) No ( )
- Do you get sufficient ICT services from the library? Yes ( ) No ( )

Any suggestions do you like to improve the ICT service in the library

……
……
……
……
……
……
……....

Thank you for your kind cooperation.

Signature

ABSTRACT

ON

Application Of Information And Communication Techology In Special Libraries In Aizawl: A Study

A Dissertation submitted to The Mizoram University in partial fulfillment of the requirement for the Degree Of Master Of Philosophy

in

Library And Information Science
(School of Economics, Mnagement and Information science)

by
R. Lalrohlui
(Regn No: MZU/M.Phil/131 of 21.05.2013)

Supervisor

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Mizoram University

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2013

1. Introduction

In today environment Information Communication Technology (ICT) is becoming an indispensable in every organization because it brings about changes in every organization's movement. The traditional tools of ICT include TV, radio and telephone whereas modern ICT tools are computer, internet and wireless communication technology, it facilitates all our communication systems we can say that all these technologies have been the driver of knowledge society. It includes uses of internet, computerization, networking, digitization etc. It is basically information handling tools which is a set of production, application and services that are used to produce, store, retrieve, deliver, process, organize, distribute, preserve, search, exchange and update of an information. The widespread use of ICT facilities increased better application of computer network, rapid growth of Internet and it causes great explosion of information quantitatively and qualitatively that forced library to adopt new method of storing, retrieving, preserving, conserving and disseminating of information.

When the telegraph was invented in 1844 the first application of ICT was begun and then during the 20th century the ICT tools were growing so fast till date. These technologies are most popular in our daily lives such as; what we use of internet, e-mail, facebook, twitter, cellular phones, multimedia, databases, programming languages, Xerox machine, printer, and design and analysis method, satellite, telephones, television etc. and in the workplace sometimes linked to all facets of society like institution, education, transportation, communication, business, scientific exploration, entertainment, knowledge management etc.

According to the American Library Association (1993), the IT (ICT) facilities use in the library is "the application of computers and other technology to the acquisition, organization, storage, retrieval and dissemination of information". In the fully-automated-library there are two types of operation works; Library House-keeping Operations and Library Information Handling Operations which are performed with the help of computers. To complete that works Network Operating System (e.g. Linux, UNIX, Windows NT, Windows XP etc.) and Library Management Software **(**e.g. TLSS, Libsys, SOUL, CDS/ISIS etc.) were used. All these technologies changed the process of the library systems, it facilitate the communication systems in a library which emphasizes user satisfaction, rapid responses, cost effectiveness, better administration and high quality library operation. Without application of ICT facilities in a large library is like an example of 'working without hand'.

1.1 Special Library

The word 'special' is firstly known used in the 13th century. It is derived from Anglo-French 'especial' which means 'individual, particular'. Whereas library is "a place, as a building or set of rooms, containing books, recordings, or other reading, viewing, or listening materials arranged and cataloged in a fixed way" (Thefreedictionary.com).

According to S.R. Ranganathan special library is “specialization in subject to be the characteristic that makes a library a special library”.

Special libraries can be divided into various types which are government libraries, research institute libraries, industrial libraries, News paper libraries, autonomous libraries, prison libraries, hospital libraries, children libraries, mobile libraries, handicapped libraries, blind libraries.

1.2 Information and Communication Technology (ICT)

Information is according to The New Shorter Oxford English Dictionary, “the result of processing, gathering, manipulating and organizing data in a way that adds to the knowledge of the receiver”. Encyclopedia Britannica defines Communication as “interest in communication has been stimulated by advances in science and technology, which, by their nature, have called attention to humans as communicating creatures”. Information Technology is according to Compact Oxford Reference Dictionary, “an extensive electronic network such as computers and telecommunications for storing, retrieving, and sending information”.

Information and Communications Technology or (ICT), is often used as an extended synonym for information technology (IT), but is a more specific term that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers as well as necessary enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information (en.wikipedia.org).

A broad definition of Information and Communication Technologies (ICTs) ranges from traditional technologies such as the printed word, to the most modern communications and data delivery systems such as terrestrial satellites that can download digital data to a laptop computer hooked up to a cellular network (S. Venkatesh).

2. Significance and Scope of the Study

Information and knowledge have become increasingly important in this globalized world; every country, state as well as city necessitate rich collection of information due to highly demand of information that causes need of sufficient information center or library to prevent, protect and provide good collections at an accelerated speed in times of the users need. All types of special libraries were very important because they were promoted to develop our culture, society and our country, and hence they were the real face of our country. The essential purpose of special library is to provide information which will assist its parent organization. When using ICT facilities in a library (that means automated library), it involves working of house-keeping operations *(i.e. acquisition, classification, cataloguing, circulation, stock-taking, serial control)* and information handling operations *(i.e. Information Retrieval, Indexing, Abstracting, Networking, Resource Sharing, Current Awareness Service, Selective Dissemination of*

Information) that practices high quality library operations and services to make users satisfaction because when there is no application of ICT in a library there can be no successful satisfaction of users.

The scope of the present study is limited to Special Libraries in Aizawl with emphasis on the application of Information and Communication Technology in the Library. There are Fifteen Special libraries in Aizawl namely- Assembly Secretariat Library; Doordarshan Kendra Library; All India Radio (AIR) Library; Presbyterian Hospital Library; Nursing Library (Civil Hospital Library); Mizoram College Of Nursing (MCON) Library; Regional Institute of Paramedical and Nursing (RIPAN) Library; College of Veterinary Science and Animal husbandry Central Agriculture University Library; Agriculture Farmer's Department Library; State Council of Educational Research and Training (SCERT) Library; Aizawl Theological College (ATC) Library; Academy of Integrated Christian Study (AICS) Library; Administrative Training Institute (ATI) Library; National Institute of Electronics and Information Technology (NIELIT) Library; District Institute of Education and Training (DIET) Library; Polytechnic Library: National Institute of Technology.

3. Review of Literature

- Al-Ansari, Husain(2011). Application of Information and Communication Technologies in Special Libraries in Kuwait. *The Electronic Library*: 29(4): 457-469.

This study explored the application of information technology in various operation and services in special libraries in Kuwait. The paper suggested its implications for the development of special libraries in Kuwait. It also indicates existing obstacles, difficulties, suggestion and recommendations for further development of special libraries in Kuwait.

- Kamba, Manir Abdullahi (2011). Implication of ICT's in Libraries of Higher Education Institutes: A Panacea Catapulting Library Development in Africa. *Journal of Library & Information Technology*: 31(1): 65-71.

This study revealed that the Implication of ICT's in Libraries of Higher Education Institutes in Africa and exposed the ICT impact on libraries of higher education. The paper has analyzed the efforts made by the higher education's libraries in Africa to recognize, restructure and re-oriented the library facilities and personnel with ICT adoption. In addition, the paper also highlights the various efforts to establish networking and consortia among the libraries, and the implications that could be derived by applying ICT into higher education libraries. The paper also highlights the reasons why ICT application is taking a snail speed in library development in Nigeria and provides the solutions as a panacea for library development in Africa.

- Murugesan, N. and Balasubramani, R. (2011). Application of ICT Based Resources and Services in Research and Development Libraries in Tamilnadu. *European Journal of Social Sciences*: 23(1): 157-164.

This study is conducted to inspect the application of ICT in Library for research and development in Tamilnadu, India. The study provides recommendations to give priority to digital library initiatives; consortia based subscription to enhance effective and efficient use of ICT in the library for research and development in Tamilnadu.

- Tiwari, Braj Kishor and Sahoo, K.C. (2011). Infrastructure use of ICT in University Libraries of Madhya Pradesh: Libraries Views. *International Journal of Information Dissemination and technology*: 1(4): 232-240.

The paper studied about the use of ICT Infrastructure in University Libraries of Madhya Pradesh and highlighted the use of ICT has influenced the libraries for its overall betterment. It examines that libraries uses ICT to provide housekeeping operations, user's services, standardization, manage communication facilities and extension of library activities. University libraries of Madhya Pradesh (MP) are in transition stage in the use of ICT. The study is based on librarians' views and attempts to reveal the real scenario of university libraries of MP as regards to its infrastructure, use and problem to develop and maintain the ICT in libraries. Survey method has been used in the study to find out the present ICT infrastructure in University libraries and use of ICT in terms of communication facilities, collection, hardware, software, networking infrastructure, housekeeping operations, user's services, training and problem areas of the university libraries. The paper concludes that university libraries of MP are in developing stage in its infrastructure and use of ICT. Lack of proper planning and supervision and frequent change in ICT are the basic hurdles in successful development of ICT in university libraries in MP.

- Anunobi, Chinwe V. and Edoka, Benson E. (2010). Use of ICT Facilities for Serials Functions in Southern Nigeria Federal University Libraries. *Scholar Website*.

The study revealed that what the serial operation of the southern Nigerian Federal university libraries performed with ICT facilities.

- Kannappanavar, B.U. and K.B, Ravi (2010). *Application of Information and Communication Technologies in Some Selected Special Libraries In Bangalore (Karnataka).*

This study was conducted to investigate the application of ICT in some selected special libraries in Bangalore (Karnataka). The analyses revealed that though the libraries had hardware, software, and communication facilities to some extent, ICT-based resources and services were not reaching the users to the expected extent. The study provides recommendations to enhance library automation and effective and efficient application of ICT.

- Kumar, B.T. Sampath and Biradar, B.S. (2010). Use of ICT in College Libraries in Karnataka, India: A Survey-Program. *Electronic Library and Information System*: 44(3): 271-282.

The study presents a comprehensive survey about use of ICT in College Libraries in Karnataka. The findings help college librarians, local government and also the UGC, New Delhi to evaluate the collage library status in Karnataka. The purpose of this study is to examine the use of ICT in thirty one college libraries in Karnataka, India by investigating the ICT infrastructure, current status of library automation, barriers to implementation of library automation and also librarian's attitudes towards the use of ICT.

- Mandal, Arub Kumar and Bandyipadhyay, Amit Kumar (2010). Application of ICT by Related Manpower Problems in the College Libraries of Burdwan. *Journal of Library & Information Technology*: 30(4): 44-52.

The study exposed that the application of ICT in academic institutions in West Bengal has increased in the recent years but the computerization work of general degree college libraries of Burdwan Sadar (North and South) is very slow due to certain problems. The train manpower is one of the major causes of slow computerization and ICT application in collage library of Burdwan. They also examines the situation of IT application and related manpower problems in government-aided general degree college libraries of Burdwan Sadar (North and South), West Bengal.

- Devchaudhary, G.B. (2007). ICT and Electronic Library: Management and Delivery within the Traditional Library.

The study revealed that the electronic library is growing fast in parallel to the traditional library. It examines that Libraries are under a lot of pressure to achieve their noble goals much faster than planned, to adopt new technologies, to compete with others in managing the tremendous growth of information and to be able to lead in the area. The management and delivery of information in an electronic library differs from traditional library in many ways. The purpose of this paper is to collect the management and delivery problems rise out of adoption of the electronic library and to present possible solutions in the areas of five basic parts of scientific management-planning, organizing, staffing, directing and controlling.

- Haneefa, Mohamed (2007). Application of Information and Communication Technologies in Special Libraries in Kerela(India). *Library Review*: 56(7): 603-620.

This study provides recommendations to enhance library automation and effective and efficient application of ICT. It is conducted to investigate the application of ICT in special libraries in Kerela, India.

- Islam, Shariful and Islam, Nazmul (2007). Use of ICT in Libraries: An Empirical Study of Selected Libraries in Bangladesh. *Library Philosophy and Practice*

The study presents the needs of ICT and it changed the work of libraries and information centers. The study also stated that Librarians, library patrons and supporters, and, above all, the government, must help develop ICT-based libraries to meet the changing demands of the users.

- Adeyoyin, Samuel Olu (2006). Information and Communication Technology Literacy Among the staff of West African University Libraries: A Comparative Study of Anglophone and Framcophone Countries. *The Electronic Library*: 25(4): 694-705.

The study contained original work that relating to differences between English and French-speaking University staff as regards Information and Communication Technology Literacy and as such it will be useful for library technology planners and educators. The aim of this paper is to ascertain the ICT Literacy level among the staff of Anglophone (English-speaking) University library staff and their counterparts in francophone (French-speaking) University Libraries in West Africa.

- Chauhan, Buddhi Prakash. (2006). ICT Enabled Library and Information Service. *Winter School on ICT Enabled Library and Information Service*: 1-10.

This paper presents how conventional Library and Information Services (LIS) can be delivered more efficiently and effectively by using Information and Communication Technologies. And it also highlights the new ICT enabled LIS, Particularly in a web based environment, and how common ICT tools can be applied to provide new innovative service.

- Haneefa, Mohamed (2006). Information Communication Technology Infrastructure in Special Libraries in Kerala. *Annals of Library and Information Studies*: 53: 31-42.

This study examines information and Communication Technology (ICT) infrastructure and its importance in a modern library or information centre. It also exposed that ICT is the electronic means of capturing, processing, storing and communicating information. It encompasses an array of hardware, software, services and networks that enable access to digital information. This study investigates the current state-of-the art information and communication technology infrastructure and the extent of the use of electronic information resources in special libraries in Kerala. Though the special libraries in Kerala have hardware, software and communication facilities to some extent, ICT based resources and services are not reaching the users to the expected extent. This has severely affected the provision of ICT based resources and services. The findings of this study would assist special libraries in India to develop strategies and policies that could make better use of ICT based resources and services.

- Adeyoyin, Samuel Olu. Information and Communication Technology Literacy Among the staff of Nigerian University Libraries. *Library Review*: 54(4): 257-266.

This paper highlights a representative overview of the attainment level of library staff in an important area of professional competence, and it shows the importance of addressing the gap between the desired levels of Information and Communication Technology Literacy and the actual levels. The aim of this paper is to ascertain the levels of Information and Communication Technology Literacy among library staff in a range of Nigerian University.

4. Research Design

4.1 Statement of the Problem

The primary aim of any library vested with the providing services and to determine the user's satisfaction. As already discussed that, Information and Communication Technology (ICT) play dynamic role to accelerate the library services in managing information and various library operations and services and its use in the libraries has brought revolutionary changes in the library from collection management to delivery of services still then, the users are not amenable to adequate information for their study and research leading thereby to cause dismay among them. This is more prevalent in special library systems those covered under the study. Further, problems lie with the users regarding their acquaintance to the technologies adopted in the libraries under study.

4.2 Objectives of the Study

The objectives of the proposed research work are as to:

- ✓ Status of ICT infrastructures in the Special Libraries of Aizawl;
- ✓ Ascertain the implications of ICT in special libraries under coverage;
- ✓ Identify the limitations of the libraries in using ICT based services;

4.3 Research Methodology

The following methods will be used for data collection and its analysis including interpretation in the study.

- **Questionnaire Method:** Two structured questionnaires will be framed with adequate questions relating to the study out of which, one will be for users to access the services being provided by the library and other for the librarian to ascertain the infrastructures developed by the library to provide the library services. The questionnaire meant for users will be distributed randomly among 200 users for the present study to elicit the data relating to the study. Further, another set of questionnaire meant for the librarian will be distributed among 16 librarians of special libraries in Aizawl to obtain the library data covered under study.
- **Interview Method:** To supplement the data, the researcher will make a personnel visit to the respective library to gather data through interview method relating to the study to know the

status of ICT application in the library and to understand their practical problems in utilizing ICT facilities.

Under the study the data collected from both the users and the librarian after receipt will be scrutinized, tabulated and analyzed for inference. Statistical inferences will be drawn by using Excel spreadsheet which is data analysis software.

5. Tentative Chapterization

The following are the tentative chapters for the present study.

Chapter 1 - Introduction

Chapter 2 - Special Libraries in Aizawl: An Overview

Chapter 3 - ICT and Its Application in Special Library

Chapter 4 – Data Analysis and Findings

Chapter 5 - Conclusion and Suggestion

Bibliography

6. Data Analysis

The analysis and interpretation of data has been done for the purpose of analyzing the data and arriving at meaningful findings. The analysis has been done in two groups:

1. Application of ICT Technology in Library (Library data);
2. Users view and satisfaction towards ICT application in selected libraries.

6.1 Application of ICT technology in library (library data)

- **Type of Special Libraries**

There are different types of special libraries some of them are under the church organization, some others are under state organization and the others are under the central government and private sector. In the Table-1 the selected special libraries in Aizawl and their basic information are given and most of the tables have been supported with graphs in the main dissertation to make it clear vision.

Table: 1: Type of Special Libraries

Sl. No.	Name 0f the Institution/Organization	Code name of Inst/Org.	Year of Establishment	Institution/ Organization type
1	Aizawl Theological College	ATC	1907	Church Org
2	Synod Hospital	SYH	1928	Church Org
3	District Institute of Education and Training	DIET	1953	State Govt
4	All India Radio	AIR	1966	Central Govt
5	Assembly Secretariat	ASL	1972	State Govt

6	State Council of Educational Research & Training Wing	SCERT	1980	State Govt
7	Mizoram College of Nursing	MCON	1980	State Govt
8	The Administrative Training Institute	ATI	1983	State Govt
9	Doordarshan Kendra	DDK	1995	Central Govt
10	Regional Institute of Paramedical And Nursing Sciences	RIPANS	1996	Central Govt
11	College of Veterinary Sciences & Animal Husbandry	VETY	1998	State Govt
12	Women's Polytechnic	POLY	1998	State Govt
13	Academy of Integrated Christian Studies	AICS	2000	Church Org
14	National Institute of Electronics and Information Technology	NIELIT	2002	A.Central Govt
15	Institute of Chartered Financial Analysts of India	IGFAI	2006	Private Sector
16	National Institute of Technology	NIT	2011	Central Govt

There are 16 special libraries in Aizawl and in all that special institutions/organizations 3(18%) of them are church organizations, 7 (44%) are state government organization 5(32%) are central government organizations and 1(6%) is private sector organization and 2 were established before independence and other are developed after independent.

- **Library collections (non-book materials)**

The selected libraries have different types of collections and what their types of non book material collections they possessed are given in the Table-2 as the research topic indicates application of ICT.

Table: 2: Library collections (non-book materials)

Sl.No	Name 0f the Institution/ Organisation	Non-book materials					
		E-book	E-journal		Databases	Audio/ Video cassettes/CDs	Microfilm/ Fiche
			Indian	Foreign			
1	ATC	No	No	No	No	263	52
2	SYH	No	No	No	No	11	No
3	DIET	No	No	No	No	No	No
4	AIR	No	No	No	No	10469	No
5	ASL	Yes	No	No	No	No	No
6	SCERT	No	No	No	No	No	No

7	MCON	No	No	No	No	No	No
8	ATI	No	No	No	No	No	No
9	DDK	No	No	No	No	3500	No
10	RIPANS	No	Yes	Yes	No	715	No
11	VETY	No	Yes	Yes	No	205	No
12	POLY	No	No	No	No	No	No
13	AICS	No	No	No	No	No	No
14	NIELIT	No	No	No	No	No	No
15	IGFAI	No	No	No	No	500	No
16	NIT	No	Yes	Yes	AICTE-INDEST Consortium	200	No

Table 2 shows about non-book materials of selected special libraries. About 50% of selected special libraries have no collection of non-print materials. Only one library (Assembly Secretariat) has e-book, three libraries (RIPANS, VETY and NIT) have some e-journals. All other special libraries are lacking e-resources. Two libraries (AIR & DDK) are very rich in audio/video cassettes/CDs collection and some other libraries are also having audio/video cassettes/CDs collection and one library (ATC) has microfilm/fiche collection.

- **Search method of books in library**

He library search methods is essential for knowing what the library situation. To know the library search conditions the detailed search method of the selected libraries are given under the Table-3.

Table: 3: Search method of books in library

Method of books search	No. of libraries	
	Yes	No
Catalogue Card	4	12
OPAC	3	13
Direct Search on Shelves	10	6
Taking Help of Library Staff	5	10

Table 3 shows the way of book searching in selected libraries and it was found that only 3 (18%) libraries' users using OPAC for book search because only these libraries are computerized and OPAC services are available for book search. In other libraries, users are searching their book through catalogue card, direct search on shelves and taking the help of library staffs.

- **Services offered by libraries**

The services offered based on ICT application by the libraries are shown in the Table-4 to know how much the library contribution about ICT application to the users.

Table: 4: Services offered by libraries

Library services	No. of libraries	
	Yes	**No**
Inter Library Loan	-	16
CAS	3	13
SDI	-	16
Bibliographic Services	-	16
Lending of Periodicals	5	11
Photocopying Service	6	10
Reference Service	8	8
Literature Search	3	13

Table 4 shows the services offered by selected special libraries under study**.** It was found that no libraries are providing inter library loan services, SDI and bibliographic services; only 18% libraries provided CAS and literature search services and 32% and 38% libraries providing lending of periodicals and photocopy services respectively while only 50% libraries are giving reference services to their users.

- **Library automated**

From the selected library how many library automation are there and what is that the level of the automation among the automated libraries are given under the Table-5A&B.

Table-5A: Library automated

Automated library	No. of libraries
Yes	7
No	9

Table-5B: Level of computerizations

Level of computerizations	No. of libraries
Fully Computerized	3
Partially Computerized	3
In Process of Computerizations	1

Table 5A & B show the status of library automation in selected special libraries. If resolved that only 7(44%) libraries are automated and 56% libraries are not automated under selected libraries.

Under automated libraries, only 3 libraries are fully automated and 3 libraries are partially automated while one library's automation is going on.

- **Sections computerized under partially computerized condition**

To fulfill library automation there are some types of sections which should be computerize in the library but if it is not and cannot be said that it is automated library. Table-5C shows what section they computerize among the automated library.

Table-5C: Sections computerized under partially computerized condition

Sections under partial computerization	No. of libraries
Acquisition	4
Circulation	7
Serials	0
Cataloguing	3
OPAC	3

Table-5C shows that the sections of libraries which are automated. It resolved that under automated libraries(7), all libraries (100%) automated their circulation section, 57% libraries have automated their acquisition section, and 43% libraries make automated cataloguing and OPAC both sections while no any libraries automated their serial section**.**

- **ICT facilities used in libraries**

In using ICT facilities the selected special libraries were not advanced enough. The conditions of ICT facility applications in the library are given in the Table-6.

Table- 6: ICT facilities used in libraries

Sl. No	Name 0f the Inst/Org.	Introduced barcode technologies	**Function activated with barcode technology**		Using RFID	Any plan to adopt RFID
			Annual stock verification	Circulation		
1	ATC	Yes	No	Yes	No	Yes
2	SYH	No	-	-	No	Yes
3	DIET	No	-	-	No	No
4	AIR	No	-	-	No	No
5	ASL	No	-	-	No	No
6	SCERT	No	-	-	No	No
7	MCON	No	-	-	No	No
8	ATI	No	-	-	No	No
9	DDK	No	-	-	No	No
10	RIPANS	Yes	No	Yes	Yes	-

11	VETY	No	-	-	No	Yes
12	POLY	No	-	-	No	No
13	AICS	No	-	-	No	No
14	NIELIT	No	-	-	No	Nil
15	IGFAI	No	-		No	Yes
16	NIT	No	-	-	No	Yes

Table 6 shows that selected special libraries in Aizawl are very unfortunate in regard to use of ICT infrastructure in their library. Only 2 (12.5%) libraries (ATC & RIPANS) are using barcode technology for circulation purpose, while only one library (RIPANS) has RFID technology in library. 31 % librarians shows their interest to use RFID technology in future.

- **Internet facilities & campus LAN in the library**

Internet facility application in the library is very essential to provide user satisfactions. The used of internet facilities and about having campus LAN in those libraries are exposed in the Table-7A&B.

Table-7A: Internet facilities in the library

Internet connection	No. of libraries
Yes	9
No	7

Figure- 7B: Availability of campus LAN

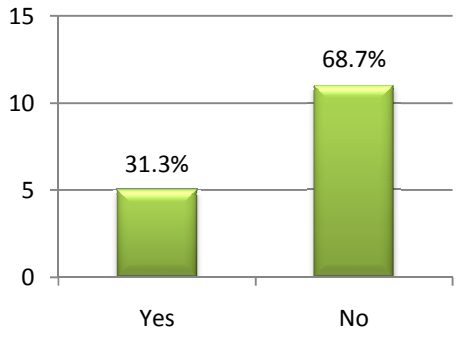

Table-7A shows the internet facilities in selected special libraries and it was found that only 56% libraries have internet facilities and 44% of libraries don't have internet connection at all. Figure 7B illustrated about availability of LAN facilities and found that only 5(31.3%) libraries have campus LAN facilities but no single library is providing their library resources/databases on

LAN. It shows that special libraries in Aizawl are not using ICT tool and services and still they are managing by manual systems.

- **Participate in library consortia**

The library consortia gets more benefits for the usersThe libraries which are participate in the Library consortia are shows in the Table-8

Table -8: Participate in library consortia

Member of library consortia	No. of libraries
Yes	2
No	14

Table-8 shows participation in library Consortia. After analysis it was found that only 2(12.5%) library are participated in library consortium (ATC library- ATLA, Glob ethics consortium and NIT Library- AICTE-INDEST Consortium).

- **Satisfaction with present ICT infrastructure of library**

To know the situation about the application of ICT, staff's opinions were taken about their satisfaction at ICT application in the library which will be exposed in the Table-9.

Table-9: Satisfaction with present ICT infrastructure of library

Satisfaction with present ICT infrastructure	No of library	Percentage
Yes	0	0%
No	16	100%

Table-9 shows the satisfaction of library staffs towards present ICT infrastructure available in library. It was found that all librarians are not satisfied with present ICT infrastructure available in library. Some librarians were saying that there were no ICT infrastructures in their libraries and they are managing library somehow with manual system.

6.2 Users view and satisfaction towards ICT application in selected libraries

For the fulfillment of the required information the user's opinion is also required, from the under Table we exposed user's opinion and expectation about ICT application in the library.

Table-10: Opinion of users about library resources

Adequate Resources	No. of Users
Yes	68
No	51
Data not given	5
Total	124

Table-10 shows the opinion of users about library resources. It was found the 55% library users are satisfied with library resources while 41% library users are not satisfied with present library resources and they feel that resources should be improve. This is may be the one reason that 60% of library users are not visited their library regularly.

Table-11: Way of getting information

Ways of Getting Information	No. Of Users
Internet	49
Intranet	0
Some Other Library	4
Personal Collections & Efforts	53
Data Not Given	18
Total	124

Table-12 reveals the way of getting the information if users are not visited library or they feel that there are no sufficient resources. After analysis it was found that majority of the users (43%) are getting the information from their personal collections or efforts while 39% users getting the information from internet which shows their interest towards internet and 3% users visited some other library to get their information.

Table-12: Type of resources used by users in library

Resources Used by the Users	No
Print sources	92
Print sources, Online Sources	7
Online Sources, Web Sources	2
Print Sources, Online Sources, Web Sources	8
CD/DVD/Cassettes'	8
Data not given	7
Total	124

Table-12 shows the type of resources used by users. It was found that majority of the users (74%) are using print resources only to fulfill their information need from library. The main motive behind it that majority of special libraries in Aizawl having print resources only and they were not automated and don't have ICT based e-resources. Only 2% users are using online web based resources and7% users are using print as well as online resources (these users were belong to only two libraries i.e. ATC & NIT). 7% users are used CD/DVD/cassettes for their information needs (these users were belong to only two libraries i.e. DDK & AIR).

Table-13: Uses of OPAC/web OPAC facilities by users

Using OPAC/web OPAC	No. of users	Percentage
Yes	20	16%
No	104	82%
Data not given	2	2%
Total	124	100%

Table-13 shows the uses of OPAC/web OPAC facilities to search their information. It was found that only 16% of users used OPAC facilities to search library materials while 82% users were not used such facilities. The reason behind it was that the maximum selected libraries are not automated till date.

Table- 14: Availability of Internet services

Availability of Internet services	No. of users	Percentage

Yes	17	14%
No	107	86%
Total	124	100%

Table 14 shows the availability of Internet for users. It was found that only 14% of users said that internet is available for them and 86% uses said that internet facilities are not available for them and they used internet facilities outside the library if it required. The reason behind it was that the maximum selected libraries have no internet connection till date.

Table-15: Satisfaction with Internet facilities

Satisfied	No	Percentage
Yes	3	18%
No	14	82%
Nil	17	100%

Table-15 show the level of satisfaction with internet services provided by selected special libraries under study. It was found that majority of the users (82%) are not satisfied with Internet due to slow speed, less number of terminals, provided limited time for access etc. On the basis of that, we can say that special libraries don't have good internet services for users.

Table-16: Availability of e- resources

Availability of e-resources	No	Percentage
Yes	15	12%
No	109	88%
Total	124	100%

Table-16 shows the opinion of users about availability of e-resources (e-book, journals & databases) in selected special libraries and it 88% user reported that their libraries don't have any e-resources. Only 12% users are reporting that their libraries have e- resources and these users are belong to only two libraries i.e. NIT & Veterinary.

Table-17: ICT infrastructure with libraries

Adequate ICT Infrastructure	No.	Percentage
Yes	6	5%
No	118	95%
Total	124	100%

Table-17 shows the users opinion about availability of ICT Infrastructures of libraries and 95% users reported that their library are lacking adequate ICT infrastructure and they are managing library services without using ICT tools and services.

Table-18: ICT infrastructures should be improved in libraries?

Opinion of Users	No.	Percentage
Yes	121	98%
No	3	2%
Total	124	100%

Table-18 shows the users opinion about improvement in ICT Infrastructures of libraries and 98% users feel that ICT infrastructures should be improve in library so that they will get good library services.

Table-19: Suggestion to improve ICT service in library

Sl. No.	Users suggestion to improve ICT service in library	No.
1	Internet facilities	115
2	Fully computerization	92
3	E-learning facilities	90
5	Sufficient Collection	94
6	Sufficient trained staffs	108
9	More ICT Facilities	119
10	Photocopying Service	97
11	More Computer	109
12	Training Program on ICT facilities	112
14	Training Program regarding e-resources	116

Table 19 shows the users opinions and suggestions about improvement of ICT applications in their libraries and it was found all most all library's users want that their library should improve in computerization of library, Internet facilities, e-learning facilities, more ICT facilities, more computers and proper training program about ICTs facilities and use of e-resources. These opinions and suggestions shows that users of special selected libraries are very much familiar with ICTs but there were no applications of these ICTs in their libraries and they hope that in near future it may be apply in his library and situation will be change.

7. Findings

The study was started with intention to find out the application of ICT in special libraries in Aizawl. To achieve the objectives the whole study was divided in two parts (1) Findings from Libraries about ICT application in their libraries and (2) Findings from users about ICT uses in their libraries. The data for study was collected using questionnaires as a tool and after analysis important findings of the study are listed below:

(1) Findings from Libraries about ICT application in their libraries

- All the special libraries were facing huge problem regarding library staffs. Almost all the libraries were lacking professional library staffs and only very few libraries have one or two staff/s that were also not very much outfitted with ICT tools and even some libraries were running without any professional library staff.
- Maximum libraries were also facing huge problem regarding library budget. They don't have separate library budget and they depend upon the parent organization leniency for fund to manage their routine activity. For automation and networking they required extra fund, which was not given by parent organizations.
- From the analyzed data it can be concluded that all special libraries of Aizawl were using print collections (like books, journals etc) and even many libraries were not subscribing journals too. It means that they were not keeping the primary source of information. Only very few libraries having thesis/dissertation and government publications. It shows that special libraries don't have proper ICT based collections.
- Special libraries of Aizawl are very much deprived in non-print collections. It is observed that only NIT Mizoram has e-journals and databases through INDEST consortium, Assembly Library has 10 e-books and AIR and DDK libraries have large number of audio/video cassettes/CDs as their collection while some other libraries have only few audio/video cassettes/CDs as a non print document.
- The maximum users came to library for only transaction of books, reading newspapers, photocopy services, reference service etc. because libraries were providing only these traditional services.
- Only 24% libraries (ATC, Synod Hospital, DIET and NIT) were providing awareness program for their users at the beginning to maximize the use of library resources. Rest other libraries were not providing such type of services to their users.

- The services provided by special libraries were appeared very traditional. The library services like internet and online databases were provided by very few libraries. Even the internet connection was available at some libraries but internet based services were not given to the users. Only 5 libraries have campus LAN facilities but no single library is providing their resources/databases on LAN. It shows that special libraries in aizawl were not using ICT tool and services and still they were managing by manual systems of library management only.
- Approximately 56% libraries were not automated and manage by manual system. Only 3 libraries were fully computerized, 3 were partially computerized and one library was under automation process. Under automated libraries (7), all were using automated circulation section, 4 have automated acquisition, and only 3 have automated cataloguing and OPAC system which show their very unfortunate response towards automation.
- The selected special libraries in aizawl were not in good position in regard to use of ICT infrastructure in their libraries. Only 2 libraries (ATC & RIPANS) are using barcode technology for circulation purpose, while only one library (RIPANS) has RFID technology.
- No single library under study was participating in any library network while only 2 libraries were participated in library consortium. The majority of the librarians (62.5%) believe that resource sharing is essential to minimize the cost of library materials and it was also essential to fulfill the demand of users even then they were not participating in any library network.
- Majority of the librarians (75%) feel that ICT improve the library services in all aspect. Now a day we could not aspect good library services without ICT applications, networking and participation in library consortia even then they are not applied these technology in their library due to some reason.
- It found that only 3(19%) libraries (Synod Hospital, IGFAI & NIT) were providing the facility to their library staffs to participate different training, workshops, These libraries also allow their staffs to go outside of state for different tanning, workshop, seminars etc. to learn about latest ICT tools & technology. Rest other libraries were not providing such facility to their staffs.
- It was found that all librarians were not satisfied with present ICT infrastructure available in library. Some librarians told that there were no ICT infrastructures in their libraries and they are managing library somehow with manual system.

(2) Findings from users about ICT uses in their libraries

- From the users data analysis it was found that users were very young in selected special libraries and they were fallen under the age group of 15-22 years (35.48%), 33.06 % users are between the age group of 21-26, 17% are between 27-32 years. Only 6.45 % library users in selected special library were above than 39 years. They were very much

familiar with ICT tools and services and they were willing to use ICT based library services even then presently they were not able to use these tools.

- Only 37% of library users were regular users and came to library regularly and rest 63% users were not regular users because all selected libraries have only traditional documents and maximum users came for issue and return of books. If libraries want to make them regular then they have to provide better ICT based library services so that they can attract toward library.
- About 50% users were not satisfied with their library resources. This may be the one cause that 60% of library users were not visited the library regularly. They feel that resources should be improved and electronic resources should be added in collection so that they can get update information in their field.
- Majority of the users (74%) were using print resources only to fulfill their information need from library. The main reason behind it that majority of special libraries in Aizawl were not automated and they did not have e-resources. Only 2% users were using online web based resources and 7% users were using print as well as online resources. 7% users were used CD/DVD/cassettes for their information needs.
- About 43% of the users got the latest information related to their study from their personal collections or efforts; 3% users visited some other libraries and 39% users get the information from internet which shows the interest of users toward ICT while maximum libraries did not provide Internet services.
- Only 16% of users used OPAC/web OPAC facilities to search their information in selected libraries. The ground behind it was that the maximum selected libraries were not automated yet.
- Majority of the users (86%) said that internet facilities were not available for them and they used internet facilities outside the library if they required. The explanation behind it was that the maximum selected libraries have no internet connection till date.
- In seven selected libraries where internet service were given to users, majority of the users (82%) were not satisfied with Internet services due to slow speed, less number of terminals, provided limited time for access etc. On the basis of this, it can summarize that special libraries have no good internet services for their users.
- The selected special libraries were lacking the training program regarding use of e-resources for users and were not providing any training program for user regarding better use of e-resources of libraries.
- About 95% users feel that their library were lacking adequate ICT infrastructure and library were managing library services without ICT tools and services and 98% users demanded that ICT infrastructures should be improve in library so that they will get good library services.

8. Suggestion

The study includes sixteen special libraries in Aizawl and they are not completely adequate in the application of ICT in their libraries. There are many things to be improved and to be put step forward in case of ICT application and library management. Based upon the study, the following suggestions are recommended:

- Libraries should have separate building with sufficient separate reading rooms. It should have separated library budget also to provide sufficient library and information services.
- Professionally trained library staffs may appointed in all special libraries with technical supporting staff so that they can develop library in professional way.
- All libraries should be computerized to enhance the library services and all resources should be available on OPAC/web OPAC so that users can easy search their information and library personnel need to be well acquainted with latest ICT techniques.
- Libraries need better funding to give more productive and effective information resources and services. In order to access electronic resources like e-journals, e-book and databases, sufficient amount of money is needed. Therefore adequate funds should be made available by the authorities for procurement of digital resources and improvement in library collection by application of ICT.
- Libraries should participate in some Library network (like- DELNET, INFLIBNET) for resource sharing and they can also participate in some library consortia (like INDEST, UGC-INFONET, CSIR etc) to enhance their e-resources in minimum cost.
- Libraries should have state-of-the art infrastructure including hardware, software, and human resources. They should adopt sufficient hardware like servers, computer terminals, printers, scanners, barcode scanners, data capture unit, CD-writers, DVD drives, VCD players, UPS, etc. and should be maintained properly.
- All libraries should connect with high speed internet connection and appropriate number of terminals may be provided to users for use of internet.
- Campus of the organization should be connected through LAN and all library resources should be available on LAN so the users can easily access information from any corner of institute.
- Library professionals should also have skills to handle ICT products, particularly library management software, operating system, telecommunication products, DBMS, data and file management, word processing, etc. They should have skills to apply ICT for service management in general and information processing, search and retrieval.
- In fast changing ICT environment, there is a need of training and professional development attitude. Therefore, all library staffs should go on proper library training/workshop in definite interval to keep them update.
- Libraries should promote ICT awareness program by organizing workshops, seminars, conferences, and special lectures to the users so that they can aware about better use of ICT in getting their information.