CHAPTER - II

STUDIES ON/ABOUT INFORMATION TECHNOLOGIES
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2.1 Introduction

This chapter provides an account of studies made by the professionals and the views of scholars in the field of Information Technologies in India and other countries. It covers various aspects of information technologies such as microforms, library automation, computerised acquisitions, circulation, serial control, computerised catalogue, library management, CD-ROM, on-line services, serial searching, E-mail, FAX, teleconference, bulletin board service and education for library staff members and users. Since there is vast amount of literature on information technologies and their use published all over the world only selected studies are presented.

2.2 Microforms

"Application of microforms have been accepted in research libraries but not in university Libraries, because it was found to be inconvenient due to lack of standardization, poor filling, design fault of equipment, poor bibliographical access". 
Patterson recalls "Libraries were started using microfilms for rare books and other deteriorating materials in 1930's. The microfilms have been used due to increase in the volume of literature is resulting increase in the collection of books in libraries. The microfilm technique was adopted as a storage device to save the space in libraries".

2.3 Library Automation

In library field First computer was used for the first time for the development of Indexing techniques under the project work of legal information through electronic system in United States during 1950.

Saha and Haldar states that "The first computer was imported from U.K and installed at Indian statistical institute (ISI) Calcutta in 1956, Further, ISI compiled a union catalogue of Calcutta libraries using punched card equipment in 1964.

Ramanujan conducted experiments pertaining to Library automation. He also carried out bibliographic data services were carried out on IBM Tex (PAC) at IIT library, Madras. He developed a software package on (a) The
Generation and maintenance of data base (b) SDI service (c) Retrospective search, and (d) Report generation.

Rajagopalan\textsuperscript{100} developed a program for Book Acquisition in IIT library at Madras. This program was designed to:

(i) Reduce technical processing;
(ii) Provide improved services;
(iii) Provide easy access to one central file;
(iv) Simplify the work procedures;
(v) Standardize the bibliographic record format;
(vi) Ensure one-time entry of information.

Lim\textsuperscript{81} Grouped library activities into four categories for the purpose of automation, viz., i) House keeping function, ii) Information Storage and Retrieval, iii) Content processing i.e. the automatic processing, indexing, abstracting and classification of documents, and iv) Management functions. Also he states that there are number of problems to install the computer in different section of the library. The major problems faced by University of Saint Malaysia are presented as below:

(i) Lack of experience in library staff;
(ii) Lack of computer resources;
(iii) Lack of technical support; and
(iv) Lack of user resistance.
Adeyemi\textsuperscript{3} states that "The storage of information in developing countries is an important factor. There exists long gap between them and industrialized nations. It constitutes a major obstacles to their economic, social, cultural and technological development. There is a need for third world countries to initiate projects aimed at ensuring their information base through the establishment of proper management of library and information centers. These projects should involve the use of new technology efficiency and effect".

Taneja\textsuperscript{128} points out that India is still in an infancy stage in application of computers to Library functions. By 1985 there were only four university libraries using micro computer in different sections of Libraries. She lists following problems faced by university libraries in India:

(a) Lack of sufficient resources to initiate and sustain the computerization programmes for libraries;

(b) Lack of cheap indigenous computer technology and its subsequent maintenance problems;

(c) Lack of enough trained manpower; Many library professionals have no perfect knowledge of working on
computers. Therefore the higher authorities have not taken initiative to adopt it and;

(d) Lack of coordination and cooperation among the information scientists and librarians.

Taneja suggested that the application of computer in libraries have been found highly significant and should take advantage of the experience of other countries. The library and Information Science Schools should include information technology in their curriculum in India, further take responsibility of training library personnel to make them handle confidently automation of library functions.

P. Subsonthi observed that the use of computers in libraries has been pioneered since fifteen years and direct application of computers in libraries has focussed on house keeping functions. The accomplishments both in on-line database searching and production of computerized union list of serials and other practices has stimulated interest in further automation. The computers potential for recording, analyzing and retrieving information needs to be fully explored. There is a lack of co-operative efforts. To improve operational efficiency, he suggested to encourage common standards and common practices.
According to Kumar71 "By 1987, there were eight University Libraries using computers for housekeeping operations and other miscellaneous works, and there were 23 computers using for different operations viz. four computers were used for search control, two computers for indexing, one for book ordering, one for circulation, one for cataloging, one for stock verification, two for selective dissemination of information, one for current awareness service and 10 computers for miscellaneous works.

Frederich Ryen and Judish Session41 Pointsout that the California State University Library has installed the computer and housed for cataloguing, acquisition and serial control. Further provision was made for network to on-line catalogue access. (OPAC). They have created a electronic environment in the campus which was more convenient to users for easy access of information they required.

According Robertson-Dathleen106 "The Ghana University Library has planned to use of Micro Computers for cataloguing and circulation and Local Area Network".

C.M.Coughlin29 states that "the computer was installed at Dew University Library, New Jersey. A database was created for documents in the Library. The software was developed for
integrated library system. Also a on-line service was introduced in the library for use of readers.

According to Gadgimath\textsuperscript{43} "the Gulburga University Library has Pentium 586 computer with CD-NET Drive and CD-server. At present, they provide E-mail service, CD-ROM service to users. The CD-Net server can connect to six terminals. There are 16 data bases available in the library: viz MathSci, Biological Abstract, BioTech, Sociofile, Ecolit, LISA, ERIC, Psylit, Cross-culture, Georef, Dissertation Abst, INSPEC, ABI/INFORM, Current Content on Disketts with Abstracts: Physics, Chemical and Earth Science, and ACODA: Agriculture, Biology and Environmental Science. The INFLIBNET has established one node at Gulburga University Library among eleven centers in India to create a real digital environment for the users. The data conversion work of documents in the library is in progress. Further, the library has planned to acquire a multimedia and instrumental material development facilities".

Cholin and Prakash\textsuperscript{25} states that the e-mail and on-line service were accessed by 20 University Libraries in India.

Veena Sharma\textsuperscript{131} writes that "Nagapur University Library has applied two Pentium Servers (SCO Unix based), installed one at the main Library building and another at in the Campus
Library building. The main Library has 9 terminals and also Campus Library has 6 terminals. Out of 9 terminals two are 486 machines, while rest are 386 machines. The Library has laser printer, and dot matrix printer. The data conversion of document in the library has been started. The barcoding was introduced at circulation counter. The kit purchased by the library includes the computer barcode scanner, laser printer and printing software. The library also possesses CD-ROM abstracts and Bibliographical data bases and is expected to acquire soon multi-media Kit. The library plans to carryout CD-ROM publishing Job vary soon. This library has also subscribed CD-ROM data bases and the LAN has been connected from CD-ROM work station to faculty buildings. The e-mail, and FAX Services are also introduced to users in the library. The library has acquired two CTV and VCR for the campus library and possess 51 video cassettes on different subjects.

Saha points out the Indian Institute of Technology Library at Delhi has a H.P 3000/37 Series of computer and Microcomputer (486-based meter-III) also installed in different sections of the library. The main system was installed in computer service centre. There are 32 terminals installed in different floors of the Library and also linked with main computer system. The Computer Division of the Library is housed three CD-ROM work stations with four
drives. Various library operations viz., circulation, cataloguing, data entry, acquisition, serial control have been computerized. The CD-ROM data bases in the library include Compindex plus, Derwent BioTech Abst, INSPEC, Metadex 1 Material collection, Mathsci, ESpace World and World Research databases. The Library provides video library Services to readers. At present there are 4 monitors and VCPs and 1000 Video cassettes available in the library on different subjects. The LAN has been installed in the campus, and it provides on-line access to library users".

Saikia\textsuperscript{112} states that the Tezpur University Library is using CDS/ISIS software package for creation of database for documents in the library. The library also plans to purchase LIBSYS software. It offers e-mail facilities to its users.

According to Konnur\textsuperscript{59} "the Jayakar Library, University of Poona at Poona has installed DEC-Alpha-2000 computer. At present there are 9 terminals connected to Server. These include PC/AT, 486, 386, 386SX and one each GIST and Dumb terminals. Two terminals are connected to computer laboratory of the Department of Library and Information Science. Rest are used for library operations. The Library has provided LAN facilities in the campus. This library is one of the nodal centre for Fibre Optic network. The data
bases of the documents can be accessed from all departments. The library sends a New Addition Lists to all departments in the campus. The CDS/ISIS is used to create a database for non-book materials. At present data consists of 1000 records of the documents in the Library.

Chandran\textsuperscript{21} states that S.V.University, Thirupathi has PC/AT-386, computer. The library has created database for current subscription to periodicals. It has extended E-mail, I-NET and ERNET facilities to their users. Five professional assistants were given training relating to use of MS-DOS, Word Star, CDS/ISIS packages. Separate databases are being created to books, journals and theses. At present the library has recorded 2100 theses. The serials database consists of 900 records.

The library has planned to purchase bar code equipment, Integrated Library Management software with OPAC facility, CD-NET and multimedia kit. It also plans to procure flatbed scanner with appropriate software to convert data from print media to machine-readable form. The library contends that this would help it in producing CD-ROM data base publication and as well in providing SDI and CAS services to its users.

A study conducted by Ravichandra Rao\textsuperscript{103} reveals that out of 91 University Libraries responded to the query of the 201
libraries, 55 have PCs, 10 have LAN, 7 have Unix, 20 have Library automation packages, 18 have CD-ROM drives, 1 has CD-Net, 3 have on-line facility, 43 have microfiche reader-printer, There are 19 libraries who are members of Library networks and 18 libraries have subscribed to 42 CD-ROM Data bases.

2.4 Computerized Circulation:

Gowri points out that a program was developed for circulation section and adopted at Indian Institute of Science, Bangalore.

2.5 Computerized Catalogue:

Millsap observes that the CAT ME (Cataloguing Micro Enhances) software facilitates as to how to add the OCLC MARC records to their local data file.

Gang-Gu describes that they developed a software for catalogue of books and implemented through microcomputer based system for cataloguing of Chinese books with high efficiency and quality. After data input, the microcomputer automatically edits and outputs the items: card catalogue, book card, book register account statistical list from the catalogue, book form catalogue. It has been installed at Xian
Jiao Tong University Library. It catalogues 500 books per week, which is 10 times more than manual cataloguing.

Smith121 according to the spread sheet package and multi plan system was introduced at University College, Cardiff (wales) to produce an electronic model of the shelving capacity and stock complement of the science library. The aim was to produce statistical information for management needs and to facilitate the management of shelf space in any future reorganization of the library stock.

2.6 Computerized Serial Control

Haravu51 describes that he has developed a program for serial control at IIT Delhi and has selected 85 periodicals for his experiments on the basis of subject, frequency and origin of countries. The programme includes three vendors - one, for American and Canadian Journals, second, for British and continental Journals and third, for Indian Journals. It includes renewal of periodical lists, sending overdue claims, production of fortnightly list of periodicals and provision for special runs".

2.7 CD-ROMs

Yong-Zong-Ying136 describes that the application of optical disc technology, including Audio-visual laser disc
and CD-ROM at Pao Sui Loong Library of Shanghai Jimo Tong University (SJTU) in the Chinese People’s Republic. According to him the music laser disc system started in 1986. Also the Audio-visual laser disc and CD-ROM system started in June 1987. The USMARC format records in the Bibliofile Data base on CD-ROM have been used in cataloguing western language materials and transferred into the library integrated system of SITU as the standard bibliographic resource.

Wright contends that CD-Rom is ideal for developing countries because of its easiness in use. He observes that a serious limitation to the development of library automation in the third world is the lack of suitable trained manpower. System librarians and library programmers are usually needed to develop or implement new systems and the staff with appropriate experience are not available. Therefore, the easier the systems is to set up and operate, the more advantageous it is and this is one of the attractions of CD-ROMs.

According to Gold a Video tape instruction was prepared at Pursue University of Indian showing a librarian performing a search and use of the mash SC-CD-ROM databases including the printing and downloading of data to a 3.5 inch disc. Majority of users were not familiar with searing,
boolean operators, of CD-ROMS, the 7 minute video covered the location of CD-ROM; hardware/software, search strategy, boolean operation, printing and downloading of information.

Ali⁴ conducted a study of faculty members for information access through CD-ROMs. He presents an analysis of data on the use of CD-ROM for database searching and data interlibrary loan activities since five years. It shows that there is a strong relationship between the use of CD-ROMs and increase in faculty publication output. The study demonstrates that the libraries dramatic increase of access to the world's bibliographical information resources is due to the acquisition of CD-ROM databases. Also it is a significant factor for the increase in faculty research publication output. The use of CD-ROM in libraries has also improved".

Rumsey¹⁰⁸ describes a user instruction prepared on Hypercard at University of JOWA, USA to teach user how to search the MEDLINE CD-ROM data base on an IBM computer. Further he outlines other bibliographic instruction tools developed from this instruction and examines the usefulness of Hypercard as a library instructional tool.

According to Guzo⁵⁰ CD-ROM-MEDLINE service was introduced in the university of Zimbabwe, Medical school
library in 1989. He conducted a study on MEDLINE-CD-ROM use by users and evaluated the use of services and its effects on users, staff and the library services.

Keylard\textsuperscript{68} says that CD-ROMs are more advantageous for developing countries. He states that there are several issues which need to be taken into consideration for application of CD-ROM technology. He further brings about the following points:

i) A CD-ROM work station is not a question and answer machine. Bibliographic databases on CD-ROMs are reference tools. Also a full text databases are beginning to come out. Majority of databases will contain bibliographic citations only. Thus unless proper inter library and document delivery system are in place, searches on CD-ROMs may not be useful.

ii) The assumption that it is easy to use and no extensive training is needed may not be true with reader who have no experience with computers and bibliographic databases. Similarly basic knowledge of operation software (MS-DOS) is vital for anyone operating a CD-ROM work station. Some knowledge of word processing is also strongly recommended to re-package output from CD-ROM.
Therefore, unless library staff are trained appropriately, CD-ROM equipment may be under utilized.

11i) Although CD-ROM may appear to be a cheaper alternative to on-line service, there are some hidden costs which need to be taken into consideration such as floppy diskettes, printer suppliers and papers. There is a need to take into account subscription costs. The majority of CD-ROMs containing bibliographic data are sold on an yearly subscription basis. A time may come to cancel the CD-ROM subscription due to variation of costs. Usually all suppliers require all old disc to be returned to place latest CD-ROM. If subscription is cancelled CD-ROM cannot continue for more time. If there is a long term budget to library, one can use CD-ROMs.

Inspite of these limitations he feels that CD-ROM is still one of the best technology for developing countries.

Dyson conducted ERIC & AGRICOLA CD-ROM database users survey at Montana State University Library. He found that only 17% of the total searches inappropriate. He points out that while some users may be satisfied with use of CD-ROM, many may not realize that they would do much better. Further, he suggested that training should be given to users about how
to use CD-ROMs in library. Librarian should work with database producer to make the databases more understandable to the users. The study revealed that majority of users preferred computerized sources than printed sources.

According to Blumenthal a user training was conducted at Georgia State library about how to search CD-ROM Bibliographic databases. Further this library planned for forthcoming developments and their impact on the user training programme.

Kanamúgíre states that a study was conducted at the King Fahd university of petroleum and mineral library, Saudi Arabia, to determine whether there was an increase in ILL requests since the introduction of CD-ROM searching. The analysis of the data collected from ILL requests received between August 1991 to Sept 1992 indicated that there was an increase of 13% over 21% of all ILL requests and these were prompted by CD-ROM searching.

According to Mirza Computer based CD-ROM tutorials was prepared for students to train them on how to search CD-ROM databases of Acquatic Sciences, Fisheries abstracts and Life Science collection at Ohio State University Library.
In a study conducted by Lancaster\textsuperscript{73} he analysed the results of 35 searches performed by readers of Illinois State University, Milner library in the ERIC databases on CD-ROM were compared with the results for the same topics achieved by an experienced education librarian and by a team of librarians. The different ratios like recall, precision and novelty were calculated. The results show that the users all faculty members or graduate students, found only about one third of a really important items. Further, the study points out that library users are frequently misled into thinking that CD-ROM databases are easy to use.

Laribee\textsuperscript{76} conducted a user survey at Booth Library, Eastern Illinois University on CD-ROM and on-line databases available in library and Via ILLINET online the State wide computerized network with holdings of over 800 Illinois Libraries. This questionnaire survey of University faculty and administrators carried out and to determine the users opinion on the level of awareness and usage of the libraries electronic information resources and suggested that there is need to user training programme at the university library.

Clark\textsuperscript{26} states that the Florida University at Gainesville was started to produce a series of CD-ROM databases containing many of the agricultural extension
programmes. The database called as FAIRS (Florida Agricultural Information Retrieval system) contains full text information, colour graphics, decision making aids, a database, and line drawings. The FAIRS was developed to resolve some of the difficulties country extension agents facing in maintaining and controlling print publications.

Mas\textsuperscript{84} observes that it is difficult to instruct CD-ROM users in new University Libraries because users come from different background knowledge. He therefore, recommends the programmer to develop easy name search of CD-ROM and to provide training for end users of the library.

Fry\textsuperscript{42} describes that a full text database of reference tools was introduced for students and faculty members at Troy State University, Alabama. This system known as Basic Research and Information network (BRAIN). Further a CD-ROM Local area network with four full-text databases geared for the undergraduate user. While BRAIN received more importance to user the library also gained a new respect in the eyes of its users.

Moscoso\textsuperscript{91} surveyed the use of online databases and CD-ROM databases in the bibliographic information services and reference services of Spanish universities. The 33 responses were recelved against 40 questionnaire mailed Spanish
University library users. Further, it reveals that on-line databases and CD-ROM databases was increased over the period from 1978 to 1993.

Abdul Rashid emphasises that CD-ROMs are more useful for libraries because they contain bibliographic records and are useful for cataloguing of data. For eg. The Library corporation's Bibliofile launched in 1985, contains the complete Library of Congress catalogues of over million MARC records on CD-ROMs. Secondly the British National Bibliography has launched on CD-ROM. Libraries can access these and edit records to their own system. Whitaker have made available their book bank on CD-ROM which is used by many libraries both as bibliographic tool and as a record source to generate orders and prepare catalogue records. Union catalogues of a few libraries are also available on CD-ROMs. Some libraries are making an experiment to put their library catalogues on CD-ROM.

According to Ashoor CD-ROM Database user survey covering faculty members and Research Scholars conducted at King Fahd University of Petroleum and Minerals Library (Saudi Arabia) reveals that the majority of the faculty members had used CD-ROM services and satisfied with the services given by library. The study suggests that there is a strong need for
user training and proposes to introduce fully integrated electronic resources and services.

TSO\textsuperscript{129} conducted a CD-ROM user study for Post-Graduate Students at National Chench\textsuperscript{i} University to know the reasons for which students use CD-ROM, how they find information after using the database and to know their opinion and suggestions about CD-ROM service.

Siddiqui\textsuperscript{118} conducted a study at KFUPM library to determine the effects of CD-ROM searching on reference services and information services. The data collected before and after the introduction of CD-ROM Databases was compared to analyse the CD-ROM impact on various services, such as IIL, on-line searching, reference questions, OPAC etc. The study concludes that CD-ROM has made the nature of the reference work considerably more complex. The CD-ROM searching was made a direct impact on different reference activities. It requires new skills to reference librarians to search CD-ROM in the library.

2.8 On-line Service:

According to Hubble\textsuperscript{55} MELVYL-MEDLINE is an end-user prototype which makes the current file of the MEDLINE database available to users of the University of California's
MELVYL on-line catalogue. It examines the results of fifty questionnaires given to MELVYL-MEDLINE users at the California University at Los Angeles (UCLA) campus. It was observed from the study that majority of users were satisfied with their searches and the system in general, even though found that many poor search results. Also it states that many number of users were inexperienced with the use of other computerized systems. But, majority of users said MELVYL-MEDLINE is easy to use.

Kaske conducted a study on subject searching in an OPAC among branch libraries of University. The findings show that subject searching varies from 22% to 74% over an hour or a day. The variability for days of the week ranged from 17% to 64% and for the weeks of the semester variability ranged from 12% to 70% valuable management information on the utilization of the OPAC within each branch library and among all the branch libraries suggestion were made to use the OPAC.

Barrett conducted a study on use of OCLC cataloguing at Pell Marine Science Library, Rhode Island University. The study shows that 45% of users were used OCLC catalogue but subsequently demanded the original cataloguing records.
Evans\textsuperscript{38} states that a local made software loaded for databases in on-line library system at Carnegie Mellon University to offer an on-line catalogue information. It offers in house access to 5 on-line and 2 reference/full text databases.

According to Kaske-Nealk\textsuperscript{66} a subject searching in an Online Public Access Catalogue (OPAC) at a University Library (Calamba University at Tuscaloosa) studied from full semester shows that subject searching varied from 35\% to 52\% over the weeks of the semester. The variability for hours of the day ranged from 40\% to 55\% and within the days of the weeks variability ranged from 44\% to 64\%. A measure of intensity of searching is present along with methods for noting high and low system.

2.9. E-Mail Service:

Lynch\textsuperscript{83} points out that the electronic mail system was implemented through a series of extensions to the WYLBUR text editing system on its central computing system at University of California's Library.

According to Choate\textsuperscript{24} E-mail was connected for ILL among 15 Australian University Libraries through ACIMAIL which was provided by ACI Computer service.
Buxton\textsuperscript{17} states that the Joint Academic Network (JANET) setup in 1984 is a wide-area network linking together a large member of computers and users in British Library, through JANET many OPACs databases hosts and other information system may be accessed.

Lee\textsuperscript{78} points out that American Library Association has setup its own network called ALANET for the benefit of members, Libraries and end users. It currently has about 1900 mail boxes and provides services such as E-mail service which link to suppliers, notice board and gateways to on-line database.

According to Howards\textsuperscript{54} E-mail was introduced in Reference Services at University of Health Sciences Library to Communicate with users throughout the health Science Complex.

Parker\textsuperscript{93} states that Australian Library Association has setup its own network called ILA NET. It is basically Library E-mail system. There are about 400 mail boxes of professional members.

Adam\textsuperscript{2} conducted use of e-mail survey among 26 polytechnic libraries and 23 University Libraries and 3 National and sconul secretariat of UK. Boddington\textsuperscript{13} states
that the usage of e-mail was increased by users in University Libraries of UK. According to Chang-Amy, an e-mail programme was designed by the staff of the Inter Library Loan section at Texas Tech University Library. The system allows users to request materials from their offices and homes at any time of the day. Several options have been developed for the menu-driven e-mail system like article, dissertation, renewal requests and status of checking.

According to Rhine, the e-mail was used to claim missing journals through ALANET which was urgently needed for clinicians and researchers in the Health Science Center Library at University of Florida. ALANET facilitates claiming of missing journal issues supplied by a subscription agency located in West Germany.

Bristow points out that a reference service was provided through e-mail at Indian University in Bloomington since 1987 as part of the libraries component of an electronic academic information environment. A survey was conducted to obtain a better understanding of the e-mail experience to identify the users and to consider improvements and modifications.

Farley describes the CAS is being provided by use of the MELVYL system at the University of California combined
with e-mail. Use of update command implements a repeated search. Also new results of libraries were regularly mailed via e-mail.

2.10 Bulletin Board Service:

Balas\textsuperscript{7} states that there were comments on two Bulletin Board Systems (BBS), Channel 1 and exec net. The channel 1 offers over 50,000 files to IBM, Amiga, Macintosh and unix users. Execnet is located at Mt. Vernon, New York. It offers several gateways including I Link, Info Base and Fax Mail, both BBS run on PC Board BBS Software.

According to Henry\textsuperscript{53} a Bulletin Board system displays a bibliographic database for the library instruction lab at California State University. It also demonstrates the basic principles of databases searching, downloading and printing for the databases available in library.

2.11 Training for Library Staff

Rader\textsuperscript{97} states that the Library of the University of Tennessee, Knoxville, successfully developed a seven-unit program of computer-based training (CBT) to library staff under Education grant. The program's development and its implementation mark first in libraries for systematic CBT for staff which is meant for Library Training. The program has
been distributed widely to other libraries. Even though expensive, this pioneering work has promised for further development and refinement as a staff training tool and for joint utility with computer-based programs of user instruction.

Harrell\textsuperscript{52} points out that the demand for walking tours and demonstrations of the computer work stations and CD-ROM databases, at the Southern Colorado University Library, which is to be growing to a sizable extent, a computer assisted instruction system was developed to cope with the problem. Although the IBM compatible microcomputers were in the majority, nevertheless the Macintosh microcomputer and HyperCard and WindowCraft software was found to be the best combination for the task.

Bayne\textsuperscript{9} states that a computer based training should be given to library staff members which strategies has been drawn by a project team at Tennessee University at Knoxville. The strategies discussed are: Consultation with staff; involving staff in the evaluation of the products used and responding to their suggestions, active recognition of staff help, promoting support from the institution's administration and devising an implementation plan with involvement of supervisory staff.
According to Cleyle\textsuperscript{27} Computer Literacy Advancement models (CLAM) a programme was designed to library members at Health Sciences Library of Memorial University of Newfoundland, Canada for familiarizing with computer hardware and functionality. The model includes, hardware, data, memory, how to start a procedure, disk operating system and operating networks, etc.

Wayne Wilson\textsuperscript{134} states that the computer assisted learning laboratory (CALL) was opened at Northeast Louisiana University in Jan 1983. It is one of the logical location for computer assisted instruction.

Neuman\textsuperscript{92} describes an instructional design (ISD) process guide the creation of MAJIK/1, a HyperCard program delivering basic need individual library instruction in preparation for classroom teaching advanced topics. A technique derived from naturalistic inquiry (NI) was incorporated into the program's formative evaluation, which was administered to 28 students at Maryland University at College Park. The data revealed that students had little difficulty with the content of the program but extensive difficulty in navigating within the HyperCard environment. The combination of ISD and NI suggests an effective approach to developing similar materials for library education.
According to Rocker\textsuperscript{107} a computer Assisted instruction was prepared for Under Graduate Students on how to use Gateways information at Ohio State University Library. This instruction guides to the students to identify, locate, access and evaluate relevant resources. This allows them to be independent users without having to reply on workshops, brochures and a reference librarian.

Leach\textsuperscript{77} states that Computer based CD-ROM tutorials was prepared for students, on how to search CD-ROM Databases of Aquatic Scenics fisheries Abstracts and life science collections at Phio States University Library. Cooper\textsuperscript{28} says that CAI was prepared on how to search online catalogue, Bio indexes programs and new library skills programmes at California Riverside Agricultural Libraries.

Azzaro\textsuperscript{6A} states that a survey was conducted covering end users of CD-ROM databases, in Ballarat University at Victoria and the application of the Author Authoring software was used for development of a user training system (CAI) which was called as CD intro. It has been purchased by 20 Academic and few Hospital Libraries and 2 library schools within 6 months when it has been launched in Australia and New Zeland.

Sears\textsuperscript{114} has created a system on computer Assisted practice system (CAPS) for law students at Brigham Young
University Law library, Utah. The system presents the user with cross reference and bibliographic information. The system creates bibliographic entries and keeps current Bibliographies on a particular subject. The great strength of CAPS is its flexibility which allow the reference staff to create a system as broad or as narrow, as general or as detailed, as resources, such as time and personnel will allow.

Vasi\textsuperscript{130} writes that a LAN-based class room/teaching laboratory was developed in the library which was designed to teach users how to teach electronic bases effectively in Davidson Library, at University of California. It describes how the classroom was set and to work and discusses to lessons learned from its implementation.

Byers\textsuperscript{18} has designed a programme of home page on the Engineering College Mosaic World Wide Web (WWW) to provide library training for 550 incoming engineering freshmen. The training was conducted by 2 library graduate assistants and 2 people from the computer team office. Further the home page programme has been extended to graduate classes and faculty members.
Pasicznyuk\textsuperscript{94} has designed an information KIOSK for computer based users instruction and he describes the product of design, development, delivery and evaluation of KIOSK.

According to Boardman\textsuperscript{12} Computer user training has been conducted for Nursing students in Torreyson library, at central Arkansas University. The Training offered a networked access to Information Sources, including internet.

Dixon\textsuperscript{34} has developed a Computer Assisted Instruction Programme for English for under Graduates Students at Tennessee University. He discusses the development and implementation of 3 Hyper card modules to help students learn and how to find periodical articles through use of the on-line catalogue and search of MLA CD-ROOM.

Chau\textsuperscript{23} has developed a instructional programme on Hypercard for fresh users of the Library at Colorado State University Library on how to use the Library.

Crawford\textsuperscript{30} has conducted a comparative study to faculty members, students on ABI/INF of CD-ROMs from UMI, silver plotter along with OCLC to take printing/down loading facilities which is most useful resource for their studies.

F.J.Allbrant\textsuperscript{40} has developed the End User courses in information access through communication Technology (EDUCATE)
programme under project work. The aim is to produce a model of self paced user education course in the selection and use of information tools.

2.12 Conclusion

The studies dealt neither to in this chapter are only glimpses of developments in the field of information technologies and their application to libraries. The studies clearly indicate the multivarried areas of developments grouped under specific headings. The computer application, CD-ROM technology, E-Mail and Fax services. Training of staff and users are some of the thrust areas where more and more studies are concentrated.