Application and Use of Library Software in Central University Libraries in North India: A Study

Thesis

Submitted for the Award of the Degree
of

Doctor of Philosophy

in

Library and Information Science

Supervisor

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Associate Professor

BABASAHEB
BHIMRAO
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ESTABLISHED 1996

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DECLARATION

I, hereby declare that this thesis entitled **Application and Use of Library Software in Central University Libraries in North India: A Study** submitted by me in the fulfillment for the degree of Doctor of Philosophy in Library and Information Science to the Department of Library and Information Science, Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow is an outcome of my individual efforts and is an original work the contents of the thesis did not form a basis for the award of any previous degree to anyone else.

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CERTIFICATE

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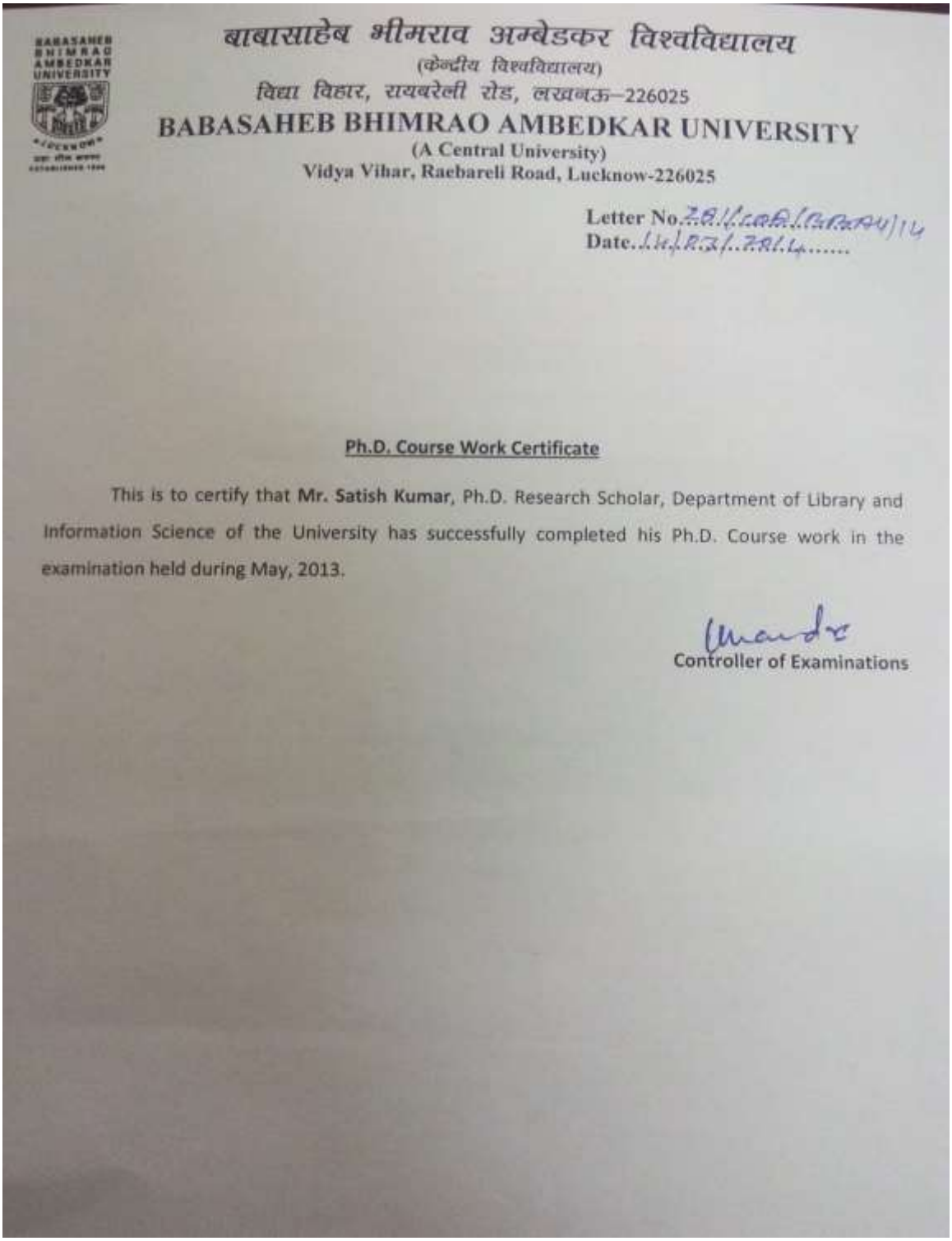

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PREFACE

After a long journey, libraries are experiencing in present scenario and providing desired information to user community. The enhancement in technology, user's expectations for 24 X 7, transformation of the scholarly communication system, automated and digital libraries, latest approaches to library management and planning and evaluation throughout the institution are propelling the new library atmosphere.

Purpose of library is to collect information resources, preserve and disseminate to its clientele. In higher education institutions, library provides assistance in educational and research activities. To provide various services (information/ information sources) with in the time libraries needs mechanism such as automation and digitization.

Library and information institution are playing a vital role using software packages. In automated libraries use and application of software helps in various tasks and services such as acquisition, circulation, cataloguing, serials management, OPAC, web OPAC, library statistics etc. software also uses in for digital library solution, to prepare institutional repository and content management.

The present study "Application and Use of Library Software in Central University Libraries in North India: A Study" has been taken for doctoral research. Through this study an attempt has been made to present a real picture of utilization of library software packages in the university libraries.

Further the study has been organized into five chapters:

Chapter 1: Introduction

Chapter first of the research work introduce the whole aspects of research topic undertaken. It describes Introduction, library automation and digitization, need of the study, scope, objectives, hypotheses, significance of the study and research methodology. It also discusses about library automation and digitization software used in North Indian Central University Libraries.

Chapter 2: Review of Literature

This chapter discusses about the literature accessed and scanned for the study whether published in India or abroad. For the present study the researcher consulted different information sources such as books, research articles, reports, university websites, resources available on internet and other materials about the specific problems related to the research topic.

Information accessed for the research work that deals with the various aspects of utilization of library software packages further with respect to library automation and digitization.

Chapter 3: Central Universities in North India: A Profile

This chapter discusses about brief history and introduction of universities. The study also describe present status of the libraries, its collection, services and other related information.

Chapter 4: Data Analysis and Interpretation

This chapter of the study discusses data analysis and interpretation. For the study relevant data collected through questionnaire, interview and personal observations analysed using

the Data Analysis and Statistical Software (STATA) and Microsoft excel were used to feed and tabulate the data to find the results. Further the data presented in tables, graphs, pi-charts and percentage circles to lead findings on research problems and discussion made on the basis of analysis.

Chapter 5: Findings, Conclusion and Suggestions

This chapter of the study presents the summary of major Findings and outcomes on the basis of analysis and interpretation of data. The Conclusion as well as Suggestions of this chapter will be helpful in determining the need of improving the central university libraries selected for the research work. On the basis of analysis, the researcher concludes the suggestions for the improvement of status of library automation and digitization.

ABBREVIATIONS USED

AACR-II	Anglo-American Cataloguing Rules-II
AGRIS	Agricultural Science and Technology Information
AMC	Annual Maintenance Contact
AMU	Aligarh Muslim University
APA	American Psychological Association
ARIC	Agricultural Research Information Centre
BARC	Bhabha Atamic Research Centre
BBAU	Babasaheb Bhimrao Ambedkar University
BHAIL	Bharat Heavy Electricals Ltd.
BHU	Banaras Hindu University
CAS	Current Awareness Service
CCF	Common Communication Format
CDAC	Center for Development of Advance Computing
CDC	College Development Council
CSIR	Council of Scientific & Industrial Research
CU-HP	Central University of Himachal Pradesh
CU-HR	Central University of Haryana
CUJ	Central University of Jammu
CUK	Central University of Kashmir
CUP	Central University of Punjab
DCMES	Dublin Core Metadata Set
DELNET	Developing Library Network
DESIDOC	Defence Scientific Information and Documentation Centre
DRTC	Documentation Research and Training Centre
DSTO	Defence Science and Technology Organization
DU	University of Delhi
EIL	Engineers India Limited
GEOREF	GeoRef Information Services

GER	Gross Enrollment Ratio
GSDL	Greenstone Digital Library Software
GUI	Graphical User Interface
HMT	Hindustan Machine Tools
HNBGU	Indira Gandhi National Open University
HNBGU	Hemwati Nandan Bahuguna Garhwal University
ICDDR	International Centre for Diarrhoeal Disease Research
ICT	Information and communication Technology
IDL	Indian Detonators Limited
IIM	Indian Institute of Management
IISc	Indian Institute of Science
IIT	Indian Institute of Technology
INDEST	Indian National Digital Library in Engineering Sciences & Technology
INFLIBNET	Information and Library Network
INSDOC	Indian National Scientific Documentation Centre
ISDN	Integrated Services Digital Network
ISVs	Independent Software Vendors
JMI	Jamia Millia Islamia
JNU	Jawaharlal Nehru University
LAN	Local Area Network
MARC	Machine Readable Cataloguing
MCSSs	Malaysian Chinese Secondary Schools
NCSI	National Centre for Science Information
NIC	National Informatics Centre
NICDAP	National Information Centre for Drugs and Pharmaceuticals
NICFOS	National Information Centre for Food Science
NICLAI	National Information Centre for Leather and Associated Industries
NICMAP	National Information Centre for Machine Tools and Production
NISCAIR	National Institute of Science Communication and Information Resources

NISSAT	National Information System for Science and Technology
NITIE	National Institute of Industrial Engineering
OCLC	Online Computer Library Center
ODL	Open and Distance Learning
OPAC	Online Public Access Catalogue
OSS	Open Source Software
PRL	Physical Research Laboratory
RAM	Random Access Memory
RDBMS	Relational Database Management System
RFID	Radio Frequency Identification
SAIL	Steel Authority of India
SAU	South Asian University
SDI	Selective Dissemination of Information
SOUL	Software for University Libraries
STATA	Data Analysis and Statistical Software
TIFR	Tata Institute of Fundamental Research
UDL	University Digital Library
UNESCO	United Nations Educational, Scientific and Cultural Organization
UOA	University of Allahabad
WAN	Wide Area Network
WWW	World Wide Web
χ^2	chi-square

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Introduction

Purpose of the chapter is to present an overview and nature of research work. It begins with an introduction, general concept of library automation, digitization, definitions, about in library software packages, statement of the problem, scope and limitations of the study, need and purpose of the study. It also describes the hypotheses, significance of the study as well as library automation and digitization.

1.1 Introduction

The advent of technologies like computer and telecommunication has resulted in revolutionary transformations in libraries. Computer is used to enhance efficiency and effectiveness of library operations and services. Traditional libraries having bulk of print documents are being transformed to paper less digital libraries which require minimal storage space. Virtual library, a library without walls, evolved out of this where one can globally access information at any time, using communication tools like Internet and computers.

Library software plays an important role in Library/Information Centre. Software performs different type of assignments e.g. administrative, general, housekeeping as well as routine work. A few special institutions started automation since 1970 with the application of software which nowadays are basic need to perform various activities **(Saffady, 1989)**. Development of science and technology led to an information explosion

out of which rapid changes took place. In order to meet out enormous user demands library system has immensely improved and upgraded it to face new challenges. The services offered by libraries have also undergone dramatic changes.

The core objective of Library Software is management and updating of library resources/records and offer efficient service to the users. With this objective, institutions are involved in automation, digitization- transforming classic books to electronic format for distribution through the Internet. These files can be directly accessed in HTML format while others can be downloaded in PDF format. Some publishers have books in both *digital* as well as *print* form.

Library software plays a vital role in management. It helps to achieve the objectives of an organization. It is used not only for co-operation, resource sharing and networking but also for operations like acquisition, cataloguing, circulation, serial control, stock-verification, online catalogue search, budget management etc.

Objectives of the study are to know the impact of automation and digitization in libraries of Central Universities of North India. It also aims to ascertain software used in process of digitization, digital content management and institutional repository.

It evaluate the problems and difficulties faced by librarians and satisfaction level of the staff in day to day application of the software. Thereafter it deal with the compatibility issues to fulfill all the present needs of libraries. Popularity of the software used for automation and retrospective conversion/digital content management also a part of the study.

Due to information explosion and impact of technology enormous changes are taking place in library management system. Library automation is nothing but application of computers in routine library housekeeping operations such as acquisition process, cataloguing, serials control, circulation, stock verification etc. Before moving to in depth analysis of the process it is necessary to have historical background of library automation and digitization.

1.2 Concept of Library Automation

Automation was the first step and then computerization and library automation began in some of the major institutions and organizations.

1.2.1 Automation

The term *automation* was coined by D.S. Harder, an employ of U.S. based Ford Motor Company, in 1936. It has been derived from Greek word '*automose*', meaning something having power of spontaneous or self- movement **(Webster's Third New International Dictionary of English Language, 1966)**. Harder meant by the term, '*automatic handling of segments in the process of progressive production'*.

Automation technology consists of automatic working in which the handling process, method and design of professional material are integrated. It is an effort to achieve an automatic and self-regulating chain system. Initially the technology was used for purpose of minimizing manual efforts to handle different tasks and services.

The Encyclopedia of Library and Information Science describes *automation* as 'technology concerned with the design and development of process and system that

minimizes and reduces the necessity of human intervention in operation and task' **(Kent, 1977)**.

As per **New Encyclopaedia Britannica (1973)** 'automation as a system in which there is significant substitution of electrical, mechanical or computerized action for human effort and intelligence and puts forth an operation commonly described as automated and it is substantially more automatic than its predecessor'.

According to **New Oxford American Dictionary (2001)** automation is the use of automatic equipment in a system manufacturing or other processes of production.

McGraw-Hill Encyclopaedia of Science and Technology (1982) defines automation as 'a term having no precise, generally accepted, technical meaning but widely used to imply the concept of development, use of highly automatic machinery or control process'.

1.2.2 Library Automation

The word Library Automation refers to a technical phenomenon of computerization and automation of conventional library operations like acquisition, cataloguing, circulation (charging/ discharging), serials management information services and other relevant tasks. Automation when used in a library or its similar organization, refers to the computerization or mechanization of tasks and services **(Harinarayana, 1991)**. This way application of computers to carry out various manual, repetitive routines tasks related to library services in automatic mode is library automation.

In general Library Automation means 'use of machines for library processes' **(Markerson, 1967)**.

According to Salmon, 'Library Automation is the use of automatic data processing with the use of appliances to perform various tasks and services like acquisition, cataloguing and circulation. Though aforesaid tasks were manually performed in traditional libraries but library automation may be distinguished from related fields like retrieval of information, automatic indexing, abstracting and automatic textual analysis' **(Salmon, 1975)**.

Thus Library Automation simply denotes the mechanization of conventional or manual handling of library routine activities. In other words it refers to the use of data processing tools and associated technology to carry out different library activities.

Library automation is computerization of housekeeping activities, access and retrieval of information in the library **(Dutta, 1993)**.

The International Encyclopaedia of Information and Library Science represents library automation as blurring the notion of the library collections and records as located in physical place **(Feather and Sturges, 2003)**.

Hayes and Backer classified automation and its relevant areas as following:

a. The application of data processing equipment to perform or supplement the clerical and repetitive activities involved in technical processing like circulation (charging/ discharging) and serials management.

b. Application of data processing equipment in library operation like- retrieval/accessibility, automatic indexing, abstracting and in reference related activities etc.

c. Application of computers/data processing equipment for operational research and analysis of the system.

Aforesaid definitions suggest that plenty of literature is easily available for **a.** and **b.** which not the case for **c.**

1.2.3 Historical Perspective of Library Automation

Historical development of Library automation has passed through several phases which can be classified as following-:

a. Experimental Phase from 1930 to 1960

b. Local systems Phase from 1960 to 1970

c. Co-operative Systems Phase from 1970 to the present **(Kemdarne, 2012)**.

Aforesaid phases had gone through evolutionary changes. In first phase a few library and information centers used computer and related techniques for circulation purposes as in those days computer technology was inadequate. Second phase witnessed many inventions such as OPAC (Online Public Access Catalogue), MARC (Machine Readable Catalogue) etc. During this period Ohio College Library Centre (OCLC) was set up which has online system, Library of Congress started distribution of records in a new format- MARC II. In third phase, cooperation and resource sharing among libraries developed computer based systems which are hereby described in detail.

Application of automatic data processing equipment in libraries and information centers can be traced back to the first half of the 20^{th} century. In 1936, University of Texas introduced a mechanical system to operate its circulation tasks. Years before, Libraries strived for technological aids to facilitate and improve their routine tasks and

deliver efficient services by prompt access to information. Impact of automaton in libraries and information centers have been a core subject of discussion among professionals. With the advancement of information technology- innovations from printing press to typewriters to microcomputers- had influenced wide spectrum of library operations and services which extended from description of an item to its circulation **(Voight, 1956)**. Computerization in libraries is said to have begun in 1930s with the use of punch-card in circulation and acquisition. Focus of this period was to store and access the information in punch cards which can be programmed to perform predetermined activities. Herman Hollerith, librarian of US Census Bureau, invented punch cards which were initially used in library of University of Texas for Circulation system. Over the years the second significant development was application of book charging/discharging machine in Montclair Public Library, New Jersey in 1942. In 1950, Library of Congress developed book catalogue with the help of punch card system. By 1960 most of these were in use at special libraries and information centers. In 1960s, small number of higher education institutions, corporate and large public libraries of US and UK begun with automation in the development of library operations and services. During 1961, Luhn experimented computers in libraries to provide Key-Word-in-Context (KWIC) index in Chemical Abstracts for articles. In mid 1960s, Library of Congress used computers for producing Machine Readable Catalogue (MARC) with the purpose of creating bibliographic databases of library catalogues (record of the books) which led to the development and adoption of MARC practices and established cooperative cataloguing for sharing the records **(Saffady, 1989).** After introduction of Machine Readable

Catalogue among US libraries, project MARC-I was replaced by MARC-II for venturing in shared cataloguing. In decade of 1960s, computer application gained momentum in libraries and information centers. Following decade ushered in *online period*. In 1980s automation became feasibility rather than a future goal. In the year of 1967, Ohio College Library Centers (OCLC) set up an online system which marked the beginning of co-operative systems and union catalogue **(Tedd, 1977)**.

By mid 1970s, many changes took place in libraries which made it possible to share the resources among libraries. Range of online services became accessible during this period with the help of computer system which can use bibliographic databases available on remote computers. By the end of year, computers at the University of California and University of Utah were connected to ARPANET for the purpose of resource sharing and library networking. In the following year, affiliated college of University of London and Norwegian Royal Radar establishment became first international sites to connect ARPANET for resource sharing. The ARPANET started with the applications were Telnet, FTP and email for sending and receiving messages. People recognized utility of *messaging and emailing* with Internet. By 1990 *internet* revolutionized communications in academic and research communities of the developed world **(Keefer & Tomas, 2001)**.

During 1980s, affordable cost of microcomputers made it possible for the development as well as library automation of all sizes of libraries. Furthermore, there was in intensive use of CD-ROMs, additional Random Access Memory (RAM), online systems networks, optical disks, chips, etc. Another change of this period was use of

microcomputers in libraries and information institutions through which all library processes were integrated **(Rajagopalan, 1986)**. A significant invention of this decade was Online Public Access Catalogue (OPAC) which replaced card catalogue **(Riggs, 1992)**. In recent years, number of automation software became commercially available for standard working of acquisition process, catalogue entry, circulation and serials management- all in one software package which popularized library automation in countries other than US and UK **(Malla, 2012)**.

By late 80s and early 90s, libraries installed computer to connect with other centers aiming to establish a network. Most of these networks were developed by vendors not the librarians. Other software which gained popularity during this period were spreadsheets, word processing, dBase, data managers, desktop publishing, Lotus 1-2-3 and searching for information through CD-ROMs etc. **(Wallace & Joan, 1989).** With the help of CD- ROMs having software and databases, libraries accessed information through multiple modes and kept being connected to outside databases such as OCLC, RLIN and DIALOG. CD-ROMs are more compatible for accessing information compared to print version.

Significant developments in library automation were witnessed in 90s. By this decade, computers and internet got intensively introduced into the libraries. Integrated library automation systems were correlated to Acquisition, Cataloguing, Circulation, Serials control etc. Online Public Access Catalogue (OPAC) modules were offered by vendors. The training and maintenance services offered by the vendors further eased the library automation. This decade witnessed use of networks in e-mail, ftp, telnet, internet

and connectivity to online commercial systems also noticed remarkable growth. Libraries came up with wide ranging application of World Wide Web (WWW). Inter library loan became a reality with improved telecom facilities. With improvement in software and hardware capabilities expert knowledge systems became available during this decade. These systems improved productivity by processing bulk of books, increased conducting searches and efficient services to the users**.** With the dawn of new millennium, *Integrated Library Management Systems* offered user friendly *Graphical User Interface* (GUI) and with *hypertext technology* users are linked to other resources like electronic journals, full text materials from in-house bibliographic and online public access catalogue records **(Intuitive Products International, 2011)**.

Now-a-days, most of the significant academic, public and special libraries have installed integrated systems or aiming to procure and implement systems helpful to the librarians in prompt access to information available within the library or elsewhere in other institution. Technological developments will perhaps keep opening up new opportunities for the libraries to offer efficient, comprehensive and expeditious information services and globally connect **(Lynch, 1991)**. At the same time, it is pertinent for the librarians to update their infrastructure with latest technology in order to meet our future challenges.

1.3 Concept of Library Digitization

Digital Libraries are being setup by diverse communities and fields like science, education, culture, health, development, governance etc. Availability of various free digital library software packages, creation and sharing of information via digital library

collections has become an attractive and feasible proposition for library and information professionals **(Alhaji, 2011)**.

The concept of *digital library* came into existence after automation. Automated library environment offers access to bibliographical information of the resources. In library and information centers automation helps to easily access information resources with computerized library catalogue like *online public access catalogue (OPAC), Web-OPAC*. Digital libraries differ from conventional libraries as they make it possible to instantly access information and connect to remote areas with the help of formats like HTML, PDF, JPG, MPEG, etc. Digital environment is that in which a library can disseminate its resources in digital format inclusive of text, audio, video etc. The information/documents can be accessed via networks and also through online in digital library environment. Few libraries and information centers offer access to multimedia contents including audio and video as per requirement of the users.

The Information Infrastructure Technology and Application (IITA) working group defines digital libraries as 'systems providing users with coherent access to a very huge, organized repository of information and knowledge resources'. Digital libraries can also be defined in negation e.g. 'Library without walls or library without books'. Few other related terms in use are *digital library, electronic library, virtual library* etc. **(Jeevan, 2003)**.

"Alhaji referred to a few studies and described that:

a. Digitization means need of no buildings, enhancement of information sharing and reduction of redundancy of collections.

b. Digitization leads to connectivity of Internet in libraries. Internet is one of the preferred modes of publication and dissemination.

c. Digital materials can easily and quickly be sorted, transmitted and retrieved.

d. Access to electronic information is cheaper than print as files are stored in an electronic warehouse with compatible facilities and equipment.

e. Digital texts can be linked, made interactive and enhance the retrieval of more information.

Taking into account the advantages, it is natural to digitize most of the information and upload it on internet or Compact Disc Read Only Memory (CD-ROM) in order to make it globally accessible **(Alhaji, 2011)**.

Different projects and studies came up with few significant aims for digital libraries such as:

a. To collect, store, and organize information in digital form.

b. To promote cost effective and efficient dissemination of information.

c. To Leverage considerable investments in computing/communications infrastructure.

d. To strengthen communication and coordination among research, business, government and educational communities.

e. Contribute to lifelong learning opportunities **(Jeevan, 2003)**.

Aforesaid studies and definitions suggest that information explosion at library and information centers could not preserve and store vast amount of information/documents

in physical format. Digital libraries resolve the problems related to collection, storage, and preservation and prompt access of information through networks.

1.4 Library Software: The Concept

The software used in libraries perform services like Acquisition, Cataloguing, Circulation (issue/return), Serials management, CAS/SDI, OPAC, SMS alerts etc. In library and information centers software are used for library activities like housekeeping, operation and information handling. Library software plays a pivotal role in information storage, retrieval and dissemination.

There are two types of library software in market such as *Proprietary* and *Open Source*. Popular library software for library automation and digitization are as following:

S. No.	Area of Application	Proprietary/ Editor	Open Source Software
1.	Integrated Library Management System (Library	a. SOUL b. Libsys c. e-Granthalaya	a. KOHA b. Evergreen
2.	Digital Library and Repositories	a. CONTENTdm b. DigiTool	a. DSpace b. EPrints c. Fedora

Table: 1.1 Library Software Packages

1.5 Need of Library Software

Library Software is needed for following purposes:

a. Retrospective conversion.

b. Automate library activities and services.

c. Archive and preservation of library resources.

d. Efficient time management of the users and library staff.

e. Prompt processing and retrieval.

f. Digitization of library resources and provide access through networks.

g. Offer standard library procedures.

h. Consolidate library statistics.

1.6 Objectives of the Library Software

In library and information centers software packages are being installed and used for the following objectives:

a. Develop data base of the library record.

b. Offer user services with the application of software.

c. Enable search facility through OPAC/Web OPAC.

d. Provide access to bibliographical as well as full text information using automation and digitization.

e. Eliminate repetition in technical processes of housekeeping operations.

f. Share bibliographical and full text resources through library networking.

g. Implement new IT applications to provide high quality information.

1.7 Software Implemented and Library Automation in Indian Libraries: A Historical Perception

Library automation started in India with the promotion and support of NISSAT. The task of automation in library and information centers started in decade of 1960s. During this

period automation started in few institutions. Some of major organizations involved in computerized information handling are as follows (**Malavya, 1999**):

a. Indian National Scientific Documentation Centre (INSDOC now NISCAIR).

b. Documentation Research and Training Centre (DRTC).

c. Indian Institute of Science (IISc.).

d. Indian Institute of Technology (IIT), Madras.

e. Indian Institute of Technology (IIT), Kanpur.

f. National Informatics Centre (NIC), New Delhi.

g. Bhabha Atomic Research Centre (BARC), Bombay.

h. Tata Institute of Fundamental Research (TIFR), Bombay.

i. Physical Research Laboratory (PRL), Ahmadabad.

j. Indira Gandhi Centre for Atomic Research, Kalpakam, Madras.

k. Defence Scientific Information and Documentation Centre (DESIDOC), Delhi.

l. NISSAT Sectoral Centers: NICDAP, Lucknow; NICLAI, Madras; NICFOS, Mysore; NICMAP, Bangalore and NICRYS, Madras.

National Centre for Science Information (NCSI) at Indian Institute of Science (IISC), Bangalore initiated advanced efforts to offer computerized SDI service from foreign databases like INSPEC, BIOSIS, CA-SEARCH, MATHSCI and GEOREF to more than 3,000 users in academic and research institutions and organizations. Agricultural Research Information Centre (ARIC) provides computerized information services from AGRIS. Further ICMR, NIC and Bio-Medical Information Centre of New

Delhi are engaged in offering online access to MEDLARS, POPLINE databases etc. National Medical Library is also involved in computerization of its bibliographical services.

Application of computers/library automation has spread in most of the organizations and research institutions like the Information Centers in Research and Development Industries as well as its subsidiary units such as BHEL, SAIL, HMT, EIL, IDL, MECON etc. Some other institutions and organizations involved in computerization are Central Secretariat Library, New Delhi; Bureau of Indian Standard, New Delhi; National Council of Applied Economic Research, New Delhi; Institute of Ornamental Technology, Pune; National Aeronautical Laboratory, Bangalore; Vikram Sarabhai Space Centre, Thiruvananthapuram; NITIE, Bombay and Council of Scientific and Industrial Research (CSIR) Laboratories.

1.8 Present Status of Library Automation in University Libraries of India

Field of library automation has come up with many efforts for improvement and development. Real impetus to this field came with the establishment of the INFLIBNET Centre, Ahmadabad. Prior to establishment of INFLIBNET, efforts were made in academic libraries especially in the higher education institutions such as Indian Institute of Technology (IIT), Indian Institute of Management (IIM) and many others. For the first time, it was realised that automation was need of the hour. Funds were allocated and standards setup for data management. Furthermore, with the finalisation of format, *karvan* moved on (Singh, 2003). Most of the University Libraries have adapted

application of computers in routine activities and few of them moved to the extent of digitizing the literature so for available in hard copy. Majority of University Libraries have developed their own web pages to provide wide range of library services.

1.9 Library Software Packages

Library and information centers are making use of software packages as per requirements. To operate library tasks and services various software are in use at University Libraries of India. Descriptions of few library automation and digitization software packages are as following:

1.9.1 Library Automation Software

Following library automation software is in use at Central University Libraries of North India:

a. Libsys

Libsys Ltd. is a web based library management software company working in New Delhi. The company Libsys Ltd. is engaged in providing software solutions since 1984. Continuous improvement for last 30 years and global recognition popularized Libsys as standard package for Indian Libraries mainly in special as well as academic. Libsys that provides powerful and user oriented web OPAC and Windows based OPAC makes it an outstanding option for library atmosphere. Due to continuous improvement and development has generated Libsys suite comprising different Libsys products such as Libsys7, LSMart, LSAcademia, LSEase, LSNet, LSDigital, LSd & A makes it popular.

- **Modules**

  The library management software Libsys7 contains following Modules Like:

  - Acquisition
  - Cataloguing
  - Circulation
  - Serials Management
  - Article Indexing
  - Web OPAC and
  - Customizable Reports

- **LIBSYS7 Competency and Features**

  The software has following competencies:

  - GWT based GUI with multitasking feature
  - The standards supports like; Unicode, MARC21, Z39.50, SICI Barcode etc.
  - Federated Searching with customizable look and feel
  - User notification through E-mail and SMS
  - RSS feeds and integration with Google Books, Book Finder etc.
  - Interactive features like online reviews, ratings, renewals, reservations etc.

  (Libsys Corporation, 2013).

- **International Users**

  Libsys as an integrated library management software has got global acknowledgement and is being used in some foreign countries such as: National de Universidad, USA; University of Moratuwa, Sri Lanka; Open University of Sri

Lanka, Nawala; University of Kelaniya, Sri Lanka and Skyline University, UAE etc.

- **Users in India**

  At present more than 1000 Indian libraries are using this package for better and efficient services to their users (Husain & Ansari, 2007). Some of the major Indian University Libraries that use Libsys for automating their operations and services are as follows: IGNOU, New Delhi; JMI, New Delhi; Allahabad University, Allahabad; AMU, Aligarh; CUJ, Jammu; MDU, Rohtak: Pune University, Pune; Pondicherry University, Pondicherry; Mangalore University, Mangalore etc. **(Libsys Corporation, 2013)**.

b. SOUL (Software for University Libraries)

Software for University Libraries (SOUL) is an integrated library management software designed and development by the INFLIBNET Centre, Ahmedabad. The software suitable for University Libraries and also suitable for all kinds and size libraries. It is a user-friendly software developed to work under client-server architecture. It is compatible to International standard for bibliographic formats, circulation protocols and networking. During the CALIBER 2000; first version of software named as SOUL 1.0 version was released; with some updates the latest version of the software as SOUL 2.0 version was released in January 2009. The INFLIBNET Centre responsible for design and development of this software and also provide supports regarding installation and operation to the member libraries.

- **Modules**

  The software consists of the following modules:

  - Acquisition
  - Cataloguing
  - Circulation
  - OPAC
  - Serials Control
  - Administration

- **SOUL 2.0 Competency and Features**

  Following are the strong features of SOUL 2.0 version:

  - UNICODE based universal character sets for multilingual bibliographical records;
  - The software compliant to International standards such as MARC21, AACR-II and MARCXML;
  - User-friendly interface, Client-server based architecture that does not require training to operate;
  - Compatible with bibliographic database like; MySQL, MSSQL (or any other popular RDBMS);
  - Make facilitate cataloguing of electronic resources such as e-books, e-journals, virtually any type of information sources;
  - Users can generate reports of their choice and format along with template;

- Supports book bank, stock verification, vigorous maintenance functions, transaction level enhanced security, self-check-out and check-in etc.

➢ **User in India**

In India more than 2016 University, College, Institution, District and Public Libraries are working with the Library management software (SOUL) for the purpose of automation **(Malla, 2012)**.

c. KOHA

KOHA is an open source library management software developed by Katipo Communications with Horowhenua library trust in New Zealand during 1999 and released in 2000. It is available free of cost and suitable for all kinds of libraries. It is full featured integrated library system and provide freedom to modify/ customize the product according to the needs. Libraries that has limited budget can prefer and install to automate the tasks and services.

➢ **Modules**

Following are the modules of KOHA:

- Cataloguing
- Serial module
- Circulation
- Patron Management
- Online Public Access Catalogue (OPAC)

➢ **Features**

- OS independent any operating system like; Linux, UNIX and Macintosh

- Supports MARC21 and UNIMARC for professional cataloguing
- Multilingual and multi-user support
- Customizable circulation system and web based OPAC
- Supports online reservation, full catalogue, circulation, acquisition etc.
- Major industry-standard database type as (text, RDBMS), SQL, MYSQL etc.
- It facilitate export and import records through ISO2709.

➢ **International Users**

More than 450 libraries (excluding India) are using KOHA including academic, public, school and special libraries. The library management software package KOHA has got global acknowledgement being used in USA, Canada, Australia, Africa, and also in New Zealand. Some Asian countries like; 17 installation in Bangladesh, Afghanistan 2, 10 in Pakistan, 4 in Sri Lanka to automate their libraries (**KOHA Community, 2015**).

➢ **Users in India**

At present more than 100 libraries in India are working with the library management software KOHA. Some of the major Indian libraries that use KOHA are as follows: British Council Library; DRTC, Indian Statistical Institute; South Asian University, New Delhi; Delhi Public Library, Delhi; IIT, Roorkee (Kumar, n.d.).

d. e-Granthalaya

The software e-Granthalaya as library automation software design and developed by National Informatics Centre, Department of Electronics & Information

Technology under the Ministry of Communications and Information Technology, Government of India. This software has been designed by a team of experts from software as well as Library and Information Science fields. The software can be received on request by any of the library to install to automate their activities in India. Most of the libraries are working with e-Granthalaya 3.0 version and the next Version 4.0 is to be released with possible solutions.

- **Modules**
  - Admin
  - Books Acquisition
  - Cataloguing
  - Circulation
  - Serials
  - Micro Documents
- **Features**

  Some important features:
  - The software supports to operating system such as Win XP/ vista/7/8/Server 2003/2008/2012
  - Suitable and work-flow as per Indian Libraries
  - Facilitate to download Catalog records from Internet
  - Supports to export records in text file/ MARC 21/ ISO2709/ MARC XML/ CSV/ MS ACCESS/ EXCEL formats etc.
  - To print library statistics reports

- Articles/ Chapter Indexing through Micro-documents manager
- Facilitate to manage e-books in pdf or other formats and provides facilities of e-book viewer
- Managers meta data for non-book materials
- Facility for uploading photo and pictures of the organizations/ institutions published of website of the library also.

➢ **Users**

The software is provided free of cost for types of libraries on the request in India. Libraries from the smallest to the largest are working with e-Granthalaya. The information accessed for NIC e-granthalaya and found that at present above 3200 libraries using e-granthlaya software. The major numbers installation is some states such as: 487 from Maharashtra; 306 from Delhi; 251 Uttar Pradesh and 227 from Karnataka.

e. Virtua

The software Virtua is a full-function library management system design and developed by Virgina Technology Library Solutions (VTLS) Incorporation. The software is scalable to support everything from small libraries to some of the world's largest institutions and consortia **(VTLS, 2014)**. It is an Integrated Library System acknowledged by more than 1800 libraries in 42 countries across the world. The software is based on six special technologies such as Relational Database Management System (RDBMS), rapid development tools, database ware housing, three tier Clint Server architecture, Unicode support, ATM network

optimized applications etc. through this system the technologies facilitate database management handling, development of software and network delivery **(Husain and Ansari, 2007)**.

- **Modules**

  VTLS- Virtua supports to the following modules:

  - Acquisition and Fund Accounting
  - Cataloguing
  - Circulation
  - Serials Control
  - OPAC (Online Public Access Catalogue)
  - Statistics and Reporting
  - Chameleon Gateway

- **International User**

  The software is being used in more than 1900 libraries from 44 countries and it has its five International offices in different countries including India and the four others are as Australia, Brazil, Malaysia and Spain **(Wikipedia, 2015)**.

- **Users in India**

  VTLS-Virtua is one of the leading software in the world; but due to its non-cost effective, it is not as widely used among Indian Libraries. Malla has given in his research work that in India only a few libraries are using this software such as; National Library, Kolkata; Indian Institute of Technology, Madras; Jawaharlal Nehru University, New Delhi and University of Kashmir, Srinagar.

f. Troodon

The software Troodon provides powerful and affordable library automation solution for all size and types of libraries. This integrated library management software designed and developed by Comtek Services for complete solution of the library. The software Troodon 5.0 is the result of continuous working of 17 years in Universities, IITs and colleges.

- **Modules**
  - Acquisition
  - Circulation
  - OPAC for internet/ intranet
  - Serials Control
  - Administration
- **Important Features of the Software**
  - Graphical user interface
  - Supports to export Records in PDF, Excel and Word format
  - Reports with analysis in 3-D pie charts and bar diagrams
  - Inbuilt email editor to facilitate executive to add external attachments.
- **Users**

The software is being used by a large number of Government, self- finance and private institutions and organizations. At present above 25 public, academic and special libraries are using Troodon software for automation. Some major installation are as: Delhi University Library System, Delhi; GGS Inderpratha

University, Delhi; Gurukul Kangri Vishwa Vidyalaya, Haridwar; IIT, Roorkee, Judges Library, Delhi High Court, New Delhi, DRDO (multiple installation) (Comtek Service, 2012).

g. SLIM

Algorhythms consultants offers its services in library automation field. It is one of the leading Library automation software suppliers along with a strong customer base of over 200 libraries in India. The company has full-fledged Software Development Centre at Pune, Maharashtra. The software is an integrated, multi-tasking, multi-user library information software for the Windows environment. Due to its exhibit features that make SLIM21 as a top class software for library automation.

- **Modules**
  - Acquisition
  - Circulation
  - Cataloguing
  - Serial Control
  - OPAC/ Web OPAC
- **Features**

  Some important features of SLIM:

  - Supports cataloguing to various information resources; Books, serials publications, articles, clippings, sound recordings, films, drawings, letters, pamphlets, reports etc.

- Supports to data export and import format similar to CCF/ MARC/ ISO 2709
- Supports for Z39.50 Server and also Z39.50 Client
- Customization
- Browsing your library information through the Internet/ Intranet.

➢ **Users**

At present more than 200 libraries are using SLIM software including Public; Academic, and Special institutions and organizations in India.

1.9.2 Library Digitization Software

Following library digitization software is in use at Central University Libraries of North India:

a. Greenstone

Greenstone is an open source, multilingual software for building and distributing digital library collections and records. The software provides a new way of organizing information and publishing it either on internet or CD-ROM databases. This software produced and developed by the New Zealand Digital Library Project at the University of Waikato and developed and distributed in cooperation with the Human Info NGO and UNESCO. It is issued under the terms of GNU General Public License. The upgraded and current version of Greenstone Digital Library software is 3.06. Further, the objective of the GSDL is to empower user, particularly in University Libraries, higher education institutions and other related institutions to build their own repositories and digital libraries **(GSDL, 2014)**.

- **Features**
  - Supports to operating system: Windows/ UNIX/ LINUX
  - Documentation is available in English, French, Spanish, Russian and Kazakh
  - Searching/ browsing: Full-text and fielded search
  - Builds collection with effective full-text searching
  - Metadata-based browsing facilities
- **Users**

  The packages got global acknowledgement. In India a few institutions are using Greenstone as: Indian Institute of Management, Kozhikode and in spite of this various countries have implemented the software. In abroad some major institutions such as: "ACKU, Afghanistan; Institute of Rural Management; Detroit Area Library Network (DALNET), United States; British Library, United Kingdom; National Academy of Sciences of Armenia, Armenia" **(DOAR, 2015)**.

b. DSpace

DSpace is being used by large number of libraries for the purpose of digitization of library resources and to make digital repository. The software provide facility to captures data in various format such as- data, text, video, audio etc. and distributes over the web with searching capability. The software was designed and developed jointly by Hewlett-Packard Labs and MIT Libraries. This was an efforts as to act institutional repository intellectual productivity of research institutions/ organizations from the period of March 2000 to November 2002 **(Sastry and Reddy, 2010)**.

- **Features**
  - Supports to various operating systems as: Windows, UNIX, LINUX etc.
  - Facilitate to Lucene Search Engine
  - Supports search through exact term, Field search, Fuzzy search, Wild cards, Proximity search, Boolean search, Range search etc.
- **Users other than India**

  DSpace is the most popular software, being used by more than 1161 institutions and organizations. The major institutions are using DSpce in there organization like: "BRAC University; International Centre for Diarrheal Disease; Bangladesh (ICDDR, B); Xiamen University; DSTO (Defence Science & Technology Organization), Australia University of the West Indies Jamaica and Instituto Tecnologico de Costa Rica Bolivarium, at Venezuela etc." (**Biswas & Paul, 2010)**.
- **In India**

  At present more than 42 institutions are using DSpace to make the digital library/ repository. In India; there are some institutions take initiative to make digital library/ repository as: National Institute of Technology, Rourkela; Indian Statistical Institute (ISI), Bangalore; Documentation Research and Training Centre (DRTC), Bangalore; Indian Institute of Technology (IIT), Delhi; Indian Institute of Astrophysics, Bangalore; INFLIBNET- Inter University Centre, Ahmedabad; Raman Research Institute, Bangalore; Central University of Jammu, University of Delhi and Jawaharlal Nehru University, Delhi.

1.10 System Approach on the usage of Library Software

Library software packages operate different kinds of activities to meet out the information needs of the users. For effective utilization of the software, three stages may be helpful in implementation such as:

- Planning Stage
- Designing Stage
- Operational Stage

1.10.1 Planning Stage

Planning stage is vital for implementation of library software. A library and information institution must have a systematic planning before implementation of software as per current needs and future prospects. Systematic planning also helps to process as well as effectively utilize the resources and serve the library and information centers.

Plenty of library software packages are available both in *proprietary* and *open source software*. However, planning and selection of appropriate software for implementing a successful integrated library system is a challenging task for the librarians.

1.10.2 Designing Stage

Academic library provides information resources to its users. University libraries have wide spectrum of the users. Few Universities have PG level academics and research programs while others have UG, PG and research programs. Thus, in course of designing, few points need to be kept in mind:

- What is the purpose of this task?

- How the activities are being done?
- What activities and functions will be operated through software?
- Whether the system is being designed for access within campus or out of it?
- Why prevalent system needs to be changed? etc.

1.10.3 Operational Stage

After completion of aforesaid two stages, the system must be evaluated for suitable modifications. This is carried out in this stage. Careful evaluation may be useful to improve overall efficiency of the system and helps to achieve the goal of the organization as well as library.

1.11 Need of the Study

Library and information centers began with application of computers, at affordable cost, to operate various tasks and services with the advent of telecommunication technologies.

At present most of the libraries and information centers are working with ICT tools and technologies to operate different tasks. For this study Researcher selected North Indian Central University Libraries to identify the status of software application.

Study aims to access status of application of library software being used at the Central University Libraries in North India. This assessment enable to identify the present status of the University Libraries and also helps in finding out the strengths and weaknesses of different software packages in use. Furthermore the study also focuses to evaluate utility of software packages in use at University Libraries.

Review of literature before commencement of the study, the researcher noticed that most of the available literature on automation is not well evaluated. This is one of the reason the investigator selected this topic of research.

1.12 Objectives of the Study

The objectives of the study are as follows**:**

a. To examine about the status of automation in the Libraries.

b. To know the reasons for non-automated Libraries under study.

c. To find out different activities, facilities and services being provided through Library Automation Software in Central University Libraries.

d. To find out the prospects of digitization and networking in the Libraries.

e. To evaluate different modules of Library Software in selected University Libraries.

f. To identify the significance and benefits of Library Software in concerned Libraries.

g. To know the opinion of Librarians on usage and performance of Library Software.

1.13 Hypotheses of the Study

A hypothesis may be considered as a tentative generalization of the problem under investigation. It offers an opportunity (prior to the actual data collection) to predict the results of the study. Hypothesis is an expectation about events or simply a guess or prediction of the results of the study.

a. Automation Process is very slow in the Libraries under study.

b. Library Software fulfils various requirements of the Libraries.

c. Application of Library software helps to great extent in the improvement of services provided by the Libraries.

d. Staff of Automated Libraries are highly satisfied compare to non-automated libraries staff.

1.14 Significance of the Present Study

The present research work has following significances:

a. The study explains the impact of library software at Central University Libraries of North India.

b. The study helps in finding out the prospects of digitization and networking at the Libraries of Central University of North India.

c. It also provide information regarding various library software packages, its characteristics and also level of application and use in concerned Libraries.

d. The study also helps to find out the most used library software weather *open source software* and *proprietary software*.

e. It may also be helpful to ascertain the problems and difficulties faced by the librarians and finding out its resolution.

1.15 Statement of the Problem

The study evaluates utilization of library software packages at Central University Libraries. The researcher selected this topic of research as prior to this no study was conducted to assess the library automation and digitization software. Topic of the

research is **'Application and Use of Library Software in Central University Libraries in North India: A Study'.**

1.16 Scope and Limitation of the Study

The scope of the present study is confined to Central University Libraries of North India. Study covers Northern Indian States such as Haryana, Delhi, Himachal Pradesh, Jammu & Kashmir, Uttarakhand, Punjab and Uttar Pradesh.

The study is limited to evaluate library software packages at selected University Libraries of North India. Study aims to identify, as per objective of the research work, utility of software packages currently in use.

Scope of the study is in accordance with the topic of the study.

Following Universities have been covered under the study:

a. Aligarh Muslim University (AMU)

b. Allahabad University (AU)

c. Babasaheb Bhimrao Ambedkar University (BBAU)

d. Banaras Hindu University (BHU)

e. Central University of Himachal Pradesh (CU-HP)

f. Central University of Haryana (CU-HR)

g. Central University of Jammu (CUJ)

h. Central University of Kashmir (CUK)

i. Central University of Punjab (CUP)

j. University of Delhi (DU)

k. Hemwati Nandan Bahuguna Garhwal University (HNBGU)

l. Indira Gandhi National Open University (IGNOU)

m. Jamia Millia Islamia (JMI)

n. Jawaharlal Nehru University (JNU)

o. South Asian University (SAU)

1.17 Research Methodology

Research methodology plays a vital role as it is the core of any research project carried out for a systematic and organized study of selected problems as well as its solutions. Methods provide guidelines and procedures to be followed for analyzing available information in a structured way. It also offers a scientific approach to the available resources and relevant data related to research. Findings of the research can be drawn out of a systematic research methodology. Therefore it is very crucial to follow definite methodology to resolve the issues related to research. **(Kothari, 2004)** describes Research Methodology as 'methods or techniques the researcher uses to perform research operations'.

This study is basically an evaluation of library application software used at the Central University Libraries of North India. Specific criteria have been selected for presentation of data of the libraries to make it relevant to the study.

1.17.1 Selection of the University Libraries

Fifteen University Libraries have been selected for this study because of the fact that scope of the study is limited to North Indian Central Universities. Furthermore, the study also consists of use and application of library software. Henceforth, it is pertinent to

identify the impact of library software and its utilization as an inclusive aspect to the scope of the research.

1.17.2 Literature Survey

Literature survey is an integral part of the research. It is a process of reviewing the past studies related to the topic of research. It can be helpful in identifying the results indicative of future line of action. The data for the present study were derived from *primary* and *secondary* sources of information. Primary sources consist of journals, reports, project reports, official records, websites, interview, personal observation, and responses received from questionnaires. However, secondary information sources such as reference books, abstracts, dictionaries, yearbooks and annual reports were also consulted.

The review of related studies covered the literature published on utilization of library software packages, assessment of library software, usages of different library software packages and books on research methodology. Response to the questionnaire collected from the concerned libraries served as supplementary to the research work.

1.17.3 Selection of Methods

Selection of research methods starts with the finalization of problem of the research. Methods were selected on the basis of availability of data and its accessibility. There are various modes of research like historical method, case study, experimental method, survey method etc. Survey and historical method are most appropriate for this study. Historical method presents historical perspective of the previous studies which leads to further research. Applying this method the researcher consulted history of the institutions,

citations and published study materials related to the research. Survey method has been applied to data collection.

1.17.4 Data Collection

Data collection is an important task associated with the process of creation of specific information relevant to the study. In social sciences there are various methods of data collection having its own merits and demerits. The collection of data refers to a purposeful collection of information relevant to the subject-matter of the study. The method of collection of data relies heavily on the nature, purpose, scope of inquiry etc. on one hand and availability of resources, time etc. on other. Statistical data may be classified into primary or secondary depending upon the nature of data and mode of collection **(Verma & Verma, 1989)**.

Mode of data collection can also be based on choices and conveniences. Survey techniques have been adopted for this study:

a. Questionnaire Method

Data were collected through structured questionnaire and survey of the libraries under study. To ascertain the factual information opinion of librarians in reference to library software were obtained using a structured questionnaire. On the basis of the questionnaire opinion on different issues pertaining to library house- keeping operations were also obtained. During survey some important points/information were jotted down in a note book for preparation of thesis.

Comprehensive questionnaire was designed to collect relevant data. It was distributed among concerned librarians. Response to the questionnaire was collected, analyzed and interpreted as per the objectives of the study.

- **Framing the Questionnaire**

Questionnaire had been developed for collection of data. Its framing has carefully been done. Preparation of the questionnaire involves great deal of common sense based on the objectives, hypotheses and personal experiences **(Pickard, 2007)**. A set of single questionnaire has been designed for this study and to collect relevant data from library authorities of fifteen Central Universities of North India. The aspects covered in the questionnaire are general information regarding library, resources and services provided by the library using software packages. The questionnaire also takes into account various aspects like library automation, digitization, and library software packages, different modules of the software and Integrated Library System and impact of library software on libraries.

- **Pilot Survey**

In order to ensure reliability and effectiveness of the tool a pilot study was conducted on 02 University Libraries i.e. Babasaheb Bhimrao Ambedkar University, Lucknow and University of Allahabad, Allahabad. There were few suggestions received by the librarian/in-charge. Thus the suggestions were incorporated to improve the questionnaire.

b. Interview Method:

In order to collect accurate data, to ease the stress level of the respondents and arrive at the best possible results, interview is an important aspect of research methodology

(Oliver, 2008). It is important to have the opinion of the librarians of the concerned libraries. The interview was conducted to know some general aspects related to the use and application of library software and future plan for library improvement.

c. Observation Method

Observation method is used to evaluate functioning of the University Libraries under study. Pictures, photographs, illustrations, personal observation etc. were noted down in a journal. In addition to aforesaid methods, researcher explored and made use of primary sources/documents such as official records of correspondence between library and Government departments. Data was also collected from websites of the concerned University to prepare profile of the libraries.

1.17.5 Questionnaire for the Librarian

The questionnaire was personally served to the concerned librarians. A questionnaire, duly filled in by the librarian/in-charge/concerned authorities, was collected from every University. During the course of survey personal talks and discussions were also had with the librarians/in-charge/concerned authorities.

1.17.6 Presentation of Data

Collected data was analyzed and arranged in tabular form along with graphics. Analysis of the data indicated frequency, percentage and application of library software packages etc. *Simple mean method* and *likert scale* was applied on some data where 1 represents poor and 5 for the best.

1.17.7 Difficulties in Data Collection and its Resolutions

Sometimes the researcher faced transportation problems as few Central Universities are located in remote areas where arriving at the University campus was an uphill task.

Response of Central University of Haryana, Central University of Himachal Pradesh, Babasaheb Bhimrao Ambedkar University and Indira Gandhi National Open University was worth appreciating. In-charge librarian of Central University of Himachal Pradesh cooperated and made available the library records to fill in the questionnaire. Likewise, assistant librarian of Central University of Haryana did the same. Assistant librarian of Central University of Punjab asked for prior permission to the registrar. Repeated efforts were made to get information from the librarian of Hemwati Nandan Bahuguna Garhwal University.

Sometimes a few librarians directed the researcher to concerned section heads to interact with. Most of the librarians/in-charge were cooperative and helped out of their busy schedule while two of them delayed it for one month.

1.17.8 Data Analysis and Interpretation

The collected data from the Central University libraries of North India vide questionnaires, interview, and observation etc. was cross checked. The researcher made use of a self-designed coding sheet and statistical counting was done for each response. Finally, the obtained data have been organized, compared, tabulated, analysed, and interpreted making use of tables, figures percentages and statistical techniques etc. MS-Excel and simple statistical methods have been used to check and verify the validity of the results.

1.17.9 Citation Style

This study makes use of 6th edition of American Psychological Association (APA) format for providing bibliographical references to make it at par with previous as well as global studies.

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Chapter-2

Review of Literature

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Review of Literature

2.1 Review of Literature: Introduction

Literature review is a study of literature and information sources available on the particular topic selected by the researcher and to review the studies that have been reported earlier. It suggest new planning approach for the investigations. Literature review is very important for every of the research work. It provides information about the previous studies in relevant topic. It also helps to do research in the concerned area. Knowledge of previous studies provides the researcher an insight into what is already done. The literature review is a major component of the research proposal. "Literature review is a critical assessment, analysis and synthesis of existing knowledge related to particular field or topic. It is critical in that we are required to assess what we read. It is analyses that are required to extract different kinds of information from what we study. It is synthesis in that we are required to show the relationships that exist between studies and show how these relate to our own research work" **(Lihitkar, 2012)**. "The primary reports used in the literature may be verbal, but in the vast majority of cases reports are written documents. The types of scholarship may be empirical, theoretical, critical/analytic, or methodological in nature and second a review of literature seeks to describe summaries, evaluate, clarify and integrate the content of primary reports" **(Cooper, 1988)**.

A comprehensive literature review is an essential part of any scientific investigation or research. It reduces space within the area of subjects and that can direct scholar to fill up the gap for research work. Therefore, it is an important task for researcher to identify previously available literature to know the status of knowledge in the area of study. The literature reviewed by the researcher is in the pursuit of the present research problem that can facilitate the research problems and its objectives. A large amount of literature are available in the form of library and information science journal articles and completed research works reported in the library literature are also scanned **(Ngurtinkhuma, 2007)**.

The researcher reviewed number of studies relevant to the topic entitled "Application and Use of Library Software in Central University Libraries in North India". It covers various topics related to use and application of library software packages, library automation, library digitization, digital/ content management software, open source software, impact of ICTs in libraries and information centres, ranking of library software, retrieval capability of integrated library software etc.

Purpose of this chapter is to present brief information related to the previous studies. It introduces both published as well unpublished literature. The present study also covers all the aspects and concerned literature related to the research topic. In this chapter an attempt has made to present studies covered for literature review that are available in Indian and abroad context. The review of related literature are arranged in a chronological sequence.

Hanumappa, Dora and Navik (2014) in their study entitled "Open Source Software solutions in Indian Libraries" indicate presence of open source software such as Koha and NewGenLib in library automation/ integrated library management system category; whereas, Greenstone and Eprints in digital library software category in India. It also concludes that there is considerable interest among Indian Libraries to adopt/ migrate to open source software. The study also concludes that there are a very high percentage of libraries towards uses of LIMS while; more than half of the libraries do not implemented a digital library/ institutional repository software.

Kari and Baro (2014) in their study entitled "The use of Library Software in Nigerian University Libraries and challenges" stated that among Nigerian University Libraries the highest 24 (66.7%) were using *Hoda* due to open source software. The study reveals that the University Libraries which have been using different library software from 9 to 11 years must have migrated in to Koha and SLAM. It was also found that University Libraries were using software to operate such as Acquisition, cataloguing, Circulation, OPAC and Serials management mainly. Some other responses mentioned as they were using software to collate library staff research output and to manage users profiles etc.

Siddique and Mahmood (2014) in their study entitled "Library software in Pakistan: A review of Literature" discusses that situation in Pakistan regarding the library software cannot compared to the other advanced countries. The study highlights that lack of the standard library software package, multilingual nature of the library resources, poor budget, software piracy, unavailability of local vendors support and computer literacy were the major barriers in the effective implementation of library software packages.

Hall, Ames and Brice (2013) discuss the development of library systems using open source (Libki) software for small rural libraries. The study as "Open Source Library Software Development in Small Rural Library System" describe how an open source library project is scripted, specified, tested and rolled out. The study tested and found that this open source library automation software are useful for library operation and management. It is being used by multiple libraries across the US. It supports multiple operating systems as Windows and Linux.

Mohsin (2013) in his work entitled "Comparative Study of Library Automation Software (Special Reference of SLIM and SOUL)" aims to present usefulness of both (SLIM and SOUL) library management software, its module, characteristics and working process in libraries. The study concludes that both library management software have its limitations and both are user friendly. The study pointed out that SLIM have 8 modules and SUUL have 6 modules. In spite both software having almost similar capability such as internet connectivity, similar searching, supports internationally standards CCF, AACRII etc.

Malik (2013) in his study entitled "Digitization and Automation in University Libraries" describes current status of automation and digitization in the University Libraries. The paper highlights various aspects of the conversion of library resources into digital format. It also discusses the impact of information technology in University Libraries. Further, the study makes a more conscious effort on library automation, modernization and implementation of digitization processes.

Andro, Asselin and Maisonneuve (2012) conducted a study on "Digital Libraries: Comparison of 10 Software" this comparative study evaluates ten different library

software (both proprietary and open source) including six important aspects such as; document management, metadata, interoperability, user's management and web2.0 in the selected libraries. It concludes that the choice of software will depend mainly on the type of documents which will be upload like contemporary or old.

Chinnaraj (2012) in his study "Knowledge based Information Resources from Libraries to Higher Education Professionals and Information Managers" describes the development of computing and telecommunications have made it possible for library staff to provide user with a wide range of text, image and sound resources from around the world in a short span of time. The article express outlook of traditional as well as modern knowledge based libraries. It also represents need for training in some areas as- project management, marketing of information, database management skills, hardware and software literacy, e-publishing, web technology, modernizing the libraries, networking, knowledge management and intellectual property rights etc.

Dhanavandan and Tamizhchelvan (2012) in their study "An Evaluative Study of Automation Software Applications and Database Management System in Academic Libraries" describe an overview of the library automation software and to find out various types used in self-financing Engineering College Libraries. The paper examines the level of performance of library software in the engineering college libraries in Tamil Nadu. It also highlights that 95 percent college libraries are playing with automation software. The Auto Lib ILMS stand first and Liba Soft stand second position in utilization in different commercial library automation software.

Kumar and Jasimudeen (2012) in their study "Adoption of user Perception of Koha Library Management System in India" explain a brief introduction of Koha Software on its adoption and user's perception in Indian Library scenario. The software (Koha) is gaining popularity in the southern states of India and the member of Koha software is growing. It is because, Koha software is more user friendly, available free of cost and capable to perform library tasks efficiently. Study concludes that the excellent features have made it popular among the user community. The survey result highlights majority of the libraries above 52 percent which adopted Koha and above 47 migrated to Koha from other proprietary library management software.

Lihitker and Lihitker (2012) in their study "Open Source Software for Developing Digital Library: Comparative study" discusses the comparison of features, functions and usability of open source software (OSS), i.e. GSDL, E-prints, Fedora, Ganesha, Interio, XTS, Dienst, VuDL and New Genlib. The study also describes ranking of the software have been done based on the assigned points for each criteria. The GSDL scored maximum points, i.e., 47 and hence it is in rank first followed by VuDL which scored 43 points.

Madalli, Brave and Amin (2012) the research article "Digital Preservation in Open Source Digital Library Software" describes a practical application of Digital Library software and their utilization; how to organize, store and retrieve digital contents or resources. The study highlights that it's a necessary task of present scenario to convert items from proprietary formats into open standards, to make possible digital archive for future storage, retrieval and preservation.

Obuh and Ogheneme (2012) conducted a study on "Library Automation the Ingredients for Systems Hardware and Software Interoperability" that presents an overview of some aspects which are necessary for ensuring hardware and software interoperability in library and information systems. The paper also examined library automation standards such as DCMES, MARC-21, OAI-PMH and Z39.50.

Sharma (2012) in his study "Automation and Digitization in University Libraries: a Comparative Study of Seven North Indian University Libraries" discussed that most of the libraries are using LIBSYS for automation and with respect of digitization, it is found that the libraries lack written policy on digitization, inadequate ICT infrastructures and staff, finance, inadequate government support, low priority of library in organization etc. All the selected libraries of the region are moving fast to achieve fully automation for functions and services except HPUL.

Singh (2012) in "Status and Challenges of Public Libraries Automation in Punjab" expressed the current status and challenges that the public libraries are facing in Punjab State. The public libraries need to have mobile library concept to reach out the people in countryside. The study explains Punjab state have 14 district library and 01 state library but regrettably neither the state library nor the district libraries are providing services beyond the walls of respective cities.

Sudge (2012) in "Modernization of Libraries Attached to Defence Training and Education Institutes with Reference Services and Sources" describes that traditional libraries are not capable to play an effective role in modern society. With the explosion of information and knowledge resources there is also need of modern technologies in

libraries to manage and operate. It also describe that libraries are need to be re-engineered to suit the needs of modern society. This chapter of the thesis further highlights the issues for modernizing and plan to modernize libraries in brief. The next chapters of the research work deal with survey and modernization of DET libraries in specific and action plan and best practices to be used for the same.

Thomas (2012) in "The Florida Center for Library Automation Experience Using Drupal" describes how to use Drupal a content management system to organize and maintain database elements, like vendor information and statistical data. The article depicts how Florida Center for Library Automation uses this software to manage the records. It also explains an overview and functionality of open source software Drupal.

Uddin and Hasan (2012) in their study entitled "Use of Information Technology in Library Service: A Study on some Selected Libraries in Northern Art of Bangladesh" attempt to seek and identify the problems and barriers to give possible solutions. This research work highlights the impact, application and use of information technology in selected libraries. It also describes how to improve the entire conditions, services and activities of these libraries using with modern technologies and tools.

Upadhyay, Pandey and Srivastava (2012) highlighted the status of automation in Engineering College of Jabalpur city in Madhya Pradesh. The study observed that 52.63% of the Engineering College Libraries were not automated. The reasons were found as Lack of computer facilities, inadequate finance, Lack of trained staff, willingness Management/ higher authority and lack of attitude towards automation and unsatisfactory library software problems are the major hindrances to speedy automation.

Only 47.37% of Engineering College Libraries were using automation software to different kinds of library tasks and services. This study also gives a status view of the software packages used by different engineering college libraries and the opinion of the librarians and library staff about the performance of software in use.

Dhamdhere (2011) in his study entitled "ABCD, an Open Source Software for Modern Libraries" described that ABCD, open source library management software are able to fulfill the requirement of various types of library activities. The article highlights characteristics of open source software and it provides solution to library automation with ISBD as well as local format. It also provides excellent indexing and retrieval facility based on UNESCO's ISIS technology, a web OPAC and a library Portal with integrated meta-search and content management system to manage online as well as offline digital resources.

DLC (2011) "The Role of License type in Digital Library Software Suitability" the study presents role of license type in library software and suggest that use of any type of software is must to adopt with license. It also suggest that librarians should consider before they jump on board with any type of Open Source Software. Open Source Software has no license charge while it is certainly not free; it include customization costs to make suitable as per the need of clients.

Imo and Igbo (2011) in the study "The challenges of software in Nigerian University Libraries: Review of experience from 1990-2009" stated that automation in Nigerian University Libraries were started in the mid of 1990s and the libraries were toyed with the software such as GLAS, VATUA, X-LIB, ALICE for Windows etc. The study also

highlights that University Libraries have migrated from one software to the other. The reasons were found that inadequate technical support, lack of proper feasibility studies, deficiencies discovered and high cost of maintenance. It study depicts that there is clearly no uniformity in the types of software used among the University Libraries.

Jan and Sheikh (2011) in "Automation of University Libraries: A Comparative Analysis of Islamabad and Khyber Pukhtoon Khwa, Pakistan" presents the status of automation and found that 53 percent libraries are fully digitized, 33 percent libraries partially automated and 14 percent of them are not automated. The study suggests that libraries should develop balance learning resource Centre including print and non-print, trained library staff, user education program etc.

Krubu and Osawaru (2011) in their study "The Impact of Information Communication Technology (ICT) in Nigerian University Libraries" narrate the impact of information and communication technology, recent development and the process of application in the Nigerian University Libraries.

Lihitkar and Lihitkar (2011) conducted study on "Ranking of selected library software packages in India" that describes rank of the selected library software packages being used in different institutions libraries as per their usefulness. The study concludes that all the selected library software packages provided cataloguing, OPAC, Acquisition, Circulation and serials management facility. The study analysis 39 features of the software of ten different library software and found that Libsys is the highly rated followed by SOUL, Soft Tech and SLIM++; while I-Lib software has the lowest score. The study also reveals that for circulation activities SOUL software ranked as highest

value followed by SLIM21, SLIM++, Walk Soft Tech respectively. For OPAC, Libman is highly rated followed by SOUL. For acquisition, Libsys, SLIM21 and SOUL having all the features. For serials control most of the software having good features.

Okewale and Adetimirin (2011) in their study "Information Use of Software Packages in Nigerian University Libraries" evaluated two library software managing information in four Nigerian University Libraries. The study highlights that cataloguing module are more popular on the basis of its use in all the libraries by the library staff as well as users. The article also describes that intuition, training of the library staff, user education program; adequate computer systems at OPAC section make popular the utility of the software.

Anuradha and Sivakaminathan (2011) in their study entitled "Enhancing Full Text Search Capability in Library Automation Package: A Case Study with Koha and Greenstone Digital Library Software" explain introduction, overview and characteristics of Koha and Greenstone; their special features like retrieval facility, full text indexing and full text searching. The study further explains how to get the open sources software and their application.

Rai and Kumar (2011) in their study "Comparative features of integrated library management software systems available in Delhi" found that a variety of software packages are available in the marketplace. While, a few of the packages are fully web compatible and supports maximum technological features effectively. The study seeks to compare services, facilities and technologies incorporated in library automation software.

It further concludes that Liberty and Virtua are the best software comparison to other selected automation packages.

Vasupongayya, Keawneam, Sengloilaun and Emmawat (2011) in "Open Source Library Management System Software: A Review" focuses on review open source library management system packages currently available. The paper discusses on the abilities to perform four basic components which are traditional services, inter-library loan management, managing digital resources and common management. The paper also describe basic requirement, supporting aspects and module of each open source software.

Wei (2011) in his study entitled "Research on the Application of Open Source Software in Digital Library" consists of the research on use and utilization of Open Source Library Software in digital library. The article describes a general history and description of open source library software packages. It highlights utilization of open source are providing good performance for modernizing and developing digital libraries. The study further express that in the implementation of OSS attention should be paid on some aspects such as the rule of license usage, the importance of standardization as well as ways of managing the legal risks etc.

Balasubramanian, S., R., and S. (2010) in "Implementation of Automated Library Management System in the School of Chemistry Bharathidasan University using Koha Open Source Software" stated the importance of open source software. The study describes the characteristics and all the modules of Koha open source. It depicts how develop and update the database of Books, periodicals and other resources of the school of Chemistry Library. It also describes the issue and return functions of the

circulation section more effectively, various search options to know the availability of books in the Library and how generate the list of books due by a particular ember and also the overdue charges. It also highlights Koha is an open source integrated Library Software with all required modules, suitable for small as well as very large libraries.

Biswas and Paul (2010) in their study entitled "An Evaluative Study on the Open Source Digital Library Software's for Institutional Repository: Special Reference to Greenstone Digital Library" describe and Greenstone Digital Library Software's have helped spread the practical impact of digital library technology throughout the world, with particular emphasis on developing countries. The article takes a retrospective look at its development, the challenges that have been faced. The study tries to identify the extent of adoption of open source digital library software packages in various organizations through an online survey. The study also represents comparison among some popular OSS digital library software.

Kalita, Mazumdar and Deka (2010) in their study entitled "Re-engineering of Library: A Study of Present Scenario of Library Computerization of Academic Libraries in Sikkim" highlighted the present scenario of library computerization of both the University and College Libraries of the State. As the traditional concept of libraries are changing towards digital libraries the existing manual system should be re-engineered to cope with its changing environment. The study explains the impact of different versions of library software as Libsys, SoftLink and SOUL. The article further describes the need, importance and training program for working professionals for making them

technologically skilled so that the trained manpower can use the software packages in their respective libraries in proper way.

Mulla and Chandrashekara (2010) in their study "Use of Integrated Library Software: A Survey of Engineering College Libraries in Karnataka" intended to carry out a survey of engineering college Libraries that have computerized its operations and services. The study provides an implicit view of the professional experiences of the engineering college librarians in computerizing their operations and services. The study was limited to 128 automated Libraries of engineering college in Karnataka. It gives a status view of the software packages used by different Libraries and the opinion of the librarians and Library staff about the performance of the software being used. The study concludes that no comprehensive study has been conducted at national and local level to identify the status of software and its related problems faced by engineering college libraries in India.

Mulla, Chandrashekhara and Talawar (2010) in their study entitled "Usage and Performance of Various Library Software Modules in Engineering College of Karnataka" highlighted that Engineering College Libraries have computerized their operations and services in Karnataka. It gives a status on the software packages used by the various libraries and opinion of the librarians about the performance of the different modules of the software they have used to perform different tasks and services.

Payne and Singh (2010) in their study entitled "Open Source Software use in Libraries" stated the overview and relationship between libraries and open source software. It explains that libraries were seeking alternatives to proprietary software that requires specialized support and services also. Moreover, open source and proprietary software

have a functional likelihood. The study further highlights that developers of the proprietary applications anticipate its clientele needs, so open source software also needs the same.

Rajput and Gautam (2010) in "Automation and problems in their implementation: An investigation of special libraries in Indore, India" discussed the present status of library automation and problems in their implementation in special type of libraries in Indore city, Madhya Pradesh. The paper highlights library automation in special libraries, need of library automation, its application, various difficulties and problems faced by librarian and the supporting staff during the implementation of library automation and computerization. It concludes key suggestions for better performance of library automation to conquer the hurdles faced during automation.

Sastry and Reddy (2010) in their study entitled "Digital Repository Software Packages: An Extended Architecture for image handling in Open Source Packages" described Digital repositories play a vital role in information storage, organization, retrieval and dissemination. Greenstone is the popular and open source digital repository software packages. The Article deals with the comparison between these two digital repositories in various technical views. The authors explain that this comparative study would definitely provide help to the digital repository builders and also help the users to choose the appropriate software for their requirements in their digital repository building.

Singh (2010) in his study entitled "Library Automation in Academic Libraries in India" explains concept of library automation, status of automation in academic libraries in India and the factor which are responsible for automation. It also describes the use of

computers and internet in different activities of the library operation and further explains about future prospects of libraries.

Dongare (2009) in his study "Powerful Utilization of Open Source Software in Digital Preservation, Maintenance and Utilization: An Example of the Creation of Union Catalogue of Serials for Astronomy Libraries in India" highlighted how open source software helps to manage e-contents on web environment. It describes in detail the process of creation and development of union catalogue of scientific serials for astronomy libraries in India using open source software's tools such as MySQL and PHP Scripting language.

Evensen (2009) in his project study "Juba University Library Automation Project" described the story of library automation in Africa. The aim of this project is to establish library services like access to references, periodicals and academic information sources for research and education purpose. The project completed using open source software (KOHA). It further discusses how to search and access the resources at Juba University web portal.

Marill and Luczak (2009) in their study "Evaluation of Digital Repository Software at the National Library of Medicine" evaluated digital repository software and system in two stages in the first stage it emphasize initial evaluation of ten systems and software and in the second stage in-depth testing of three systems in the time duration of 18 month. The article also depicts the evaluation results and next steps for NML. The article highlights that the study evaluate software to choose the best and to build digital environment of the collection.

Breeding (2008) in his study entitled "Open Source Library Automation: Overview and perspective" described an overview of Open Source Library Management Software and their characteristics. The study also highlights that Open Source have been a growing part of the overall landscape for the last decade.

Faisal and Surendran (2008) in "Report on Automation of Library at Kendriya Vidyalaya Pattom Thiruvananthapuram" described characteristics and benefits of automation in school libraries. It explains that school libraries can help efficiently in teaching and learning activities. It describes the history of library automation and its impact in present scenario in India, and also describes a systematic process of automation in the libraries of Kendriya Vidyalaya, Pattom Thiruvananthapuram. Finally, the report highlights that automation software should be select as per need of the library.

Hafezi (2008) in his study entitled "Interoperability between library software: A solution for Iranian Libraries" discussed that the majority of library software in Iran found as the software did not support data exchange facility while; most of the libraries were using ISO 2709 as an export/ import and rarely using other. In addition to this, maximum numbers of library software packages were using Z39.50 to access data from Library of Congress and from National Library of Iran. The research paper also discusses a proposed model tries to acquaint harvesting metadata by open archive service provider and to found metadata records.

Harinarayana and Raghavan (2008) the study "Retrieval Capabilities of CDS/ISIS and LIBSYS: a Comparison" described comparison of eight parameters between CDS/ISIS and LIBSYS packages. The study shows the difference of 9.34% in the level of

performance in uses. It highlights that CDS/ISIS appears to score over LIBSYS when it comes to accommodating features related to database characteristics, operational control and retrieval features. On the other hand, in providing for features related subject, search aids and use assistance, LIBSYS definitely has an age over CDS/ISIS. This variation is probably because LIBSYS is a library automation package, while CDS/ISIS is essentially DBMS for bibliographic records.

Khitoliya (2008) in his M. Tech thesis "Development of Library Automation Software" highlighted how to design and implementation of library system. The study is designed to present such as library housekeeping and information handling functions based on relational database management system. The work describes how to access and improve delivery of information in various print and non-print formats for resource sharing and library networking. It concludes that use of computers and software reduces human errors and improves efficiency of library staff.

Mahesh and Mittal (2008) the research article entitled "Digital Library in India: A Review" have been touched upon issues such as digital rights management, security and digital library policies. The article also explains about management of digital libraries, issues and policies, role of information professionals, digital divide and the process of digitization.

Rutherford (2008) in "Implementing social software in public libraries" discussed that blogs are the most popular social networking software tool to access the information in public libraries. It also highlights that people related issue are the crucial issue for

libraries and information managers to take in to account while implementing social software in libraries.

Sasikala (2008) in his study "Open Source Software and its Implications for LICs" observed that Open Source Software may both a philosophy and a process; it is because the right to read, red is tribute, modify and use it freely without any license fee. It highlights a brief description, characteristics of OSS, compatibility with the libraries, possibilities of OSS in libraries and some important software available in India. It concludes that some of the library and information science professionals are excited about the OSS initiative.

Shafique and Mahmood (2008) in their study entitled "Integrated Library Software: A Survey of Lahore" evaluated most used library software packages in Lahore. The article also describes characteristics of various modules and its sub modules. According to the survey results the study shows, 31types of library software were being used by the 84 automated libraries of Lahore.

Singh and Nazim (2008) in "Impact of Information Technology and Role of Libraries in the Age of Knowledge and Information Societies" discussed the impact of information technology and role of libraries in the age of knowledge and information societies. It also highlights the problems faced by the libraries and information service sector in India and achievements over the years using modern information technologies.

Jose (2007) conducted a study on "Adoption of Open Source Digital Library Software Packages a Survey" to know the adoption of open source digital library software in various institutions through an online survey. The study emphasizes on the characteristics

and needs of open source digital library software in present scenario. It also emphasizes the need of making library science professionals to aware of different concepts and techniques in library and information science and relevant disciplines. Further the study concludes that DSpace found as most popular digital library/ content management in all open sources.

Matoria, Upadhyay and Moni (2007) in "Automation and Networking of Public Libraries in India, using the e-Granthalaya Software from National Information Centre" highlighted present scenario of library automation, resource management through e-Granthalaya, its characteristics, performance etc. The paper discussed that it is a plan and attempt to make possibilities of computerization, automation and networking in public libraries of India for resource sharing and communication. The aim of this project is to prepare a public library network system.

Olusola (2007) in his study named "An Assessment of the Library Application Software Packages in Selected Academic Libraries in Nigeria" tried to evaluate of library application software packages used in six academic libraries in Nigeria. The study discussed the adopted software's security, compatibility, user-friendliness, indexing and searching capabilities in the assessment of the effectiveness of an ideal library application software package.

Thapa (2007) in his study "Slices of Library Automation" explained that Special Libraries in India still face challenges of finance, trained staff and administrative support. She suggested that libraries should procured and migrated from locally developed software to standard and user friendly software packages such as Libsys and Alice for

Windows. In this study, it also highlighted that the comparative study of various ILMS will be helpful in selecting suitable software before implementation automation. Further the study critically examined various library software packages.

Ven and Mannaert (2007) in their study "Challenges and Strategies in the use of Open Source Software by Independent Software Vendors" discussed the challenges of Independent Software Vendors (ISVs) in maintaining modifications to open source software's components. The case study shows that Independent Software Vendors have an interest in contributing their modifications to open source software's components back to the community. Through conclusion the study suggest an idea for a closer collaboration between OSS projects and ISVs which could be helpful for both.

Bandor (2006) in "Quantitative Methods for Software Selection and Evaluation" described clearly various methods of selection and evaluation of library software. The article also explains how and why it's an important task for libraries. Through conclusion the study describe that the successful evaluation helps to select the best software.

Bozimo (2006) in his study "ICT and the Ahmadu Ballo University Library" discussed some issues of library automation. It highlights criteria for selection of the integrated library software such as "ALICE for Windows" for the project. It also highlights that University Libraries have been migrating to the software called VTLS; but not given any specific reason for migration.

Goh, Chua, Khoo, Khoo, Mak and Ng (2006) in their study "A checklist for evaluating open source digital library software" discussed about the usefulness of four Digital Library Software Packages as: CDSware, EPrints, Fedora, and Greenstone. The checklist

of the study found that Greenstone is the best open source Digital Library/ Content Management Software. The research article also describes the process of selection and evaluation and evaluation criteria DL Software.

Nagaraj, Surlinathi, Amsaveni and Balasubramani (2006) in their study entitled "Software Portal for Library and Information Science Professionals" showed the compilation of various software gateways for library and information science professionals. It discusses how library portal helps to access to a wide range of electronic information sources both within and outside of the library. The study further highlights portal for digital library, various library housekeeping software available in India and abroad, information retrieval software, web designing tools, image capturing or scanning tools, image enhancement and manipulation tools etc.

Witten, Bainbridge and Nichols (2006) in their guide book entitled "Digital Libraries in Education Specialized training course" expressed an overview of present and future technologies and applications for digital libraries including ethical, social, educational, organizational, and economic aspects as well as their impact on educational, cultural, and scientific activities. The project study also shows educators build their own digital library collections for use in the courses they educate.

Sharma (2005) in "Changing Role of Librarians in Digital Library Era and Need of Professional Skills, efficiency & Competency" discussed the concept of libraries from conventional to present as- traditional library, automated library and electronic/ virtual library. The study defines advantages of digital library, changing role of library

professionals in digital age; and skills, knowledge, competencies also required for LIS professionals.

Singh and Murthy (2005) the book entitled "Library Without Walls" discussed about digital library, digitization process, establishment of digitization laboratory, software as well as hardware aspects of digitization process, www, designing and development process of www and some other related topics. The book describes how to create and build a Library and Information Centre boundaries. The book highlights that digital libraries have emerged as a crucial component of global information infrastructure. The impact of digital is now considered so widespread being availability of various types of information sources. The objective of this book is to present source suitable not only for university based library science courses but also for library science professionals on digital librarianship. Through intense analysis, CDC of UGC suggested some changes and improvement in the course curriculum of LIS courses to include several new aspects of digital librarianship in both UG and PG courses.

Swee and Abdullah (2005) in their study entitled "The Status of School Library Automation in Malaysian Chinese Secondary Schools: A national survey" highlighted current status of library automation in Malaysian Chinese Secondary Schools (MCSSs). The study reports user's satisfaction with the systems, the automation processes involved, the problems they faced, and the causes why some libraries have not automated their housekeeping operations.

Das and Dutta (2004) in their study entitled "An Introduction to Auditing and Control of Digital Library System" described how to control and manage digital libraries. The

article explains documents and collection of digital library, information storage and retrieval process, valuation of digital library, auditing of information system, auditing and control of digital library information systems, criteria of audit and control etc.

Jeevan and Nair (2004) in "Information Technology Adoption in Libraries of Kerala: A Survey of Selected Libraries in Thiruvananthapuram" found very satisfactory and positive condition about the use of information technology in the libraries under study. The study also found positive outlook of some aspects as library staffing, Library users, library collection both print & non-print, budget of library, use of computer, computer hardware and software, information services, internet facility, digital library development etc.

Munnolli (2004) "Organising Digital Information Using Open Source Software: An Attempt for Knowledge Management in Corporate Sector" attempted to create a database and of research and development reports and trade literature applying with open source Greenstone Digital Library Software to make accessible of resources through internet. The paper also discusses the importance and the process of knowledge management.

Ramana and Rao (2003) in their study entitled "Use of Information Technology in Central University Libraries of India" discussed use of information technology (IT) in Central University Libraries. The study accepted that information technology has deeply embedded in the management of information and other resources in the University Libraries. It concludes that information technology has become a powerful tool in management of routine library in-house operations and services. It also found that use of IT in Central University Libraries is increasing gradually and significantly. It concludes

that Central University Libraries requires intelligent planning and huge investment of financial as well as human resources.

Satyanarayana (2003) in his study "A Manual of Library Automation and Networking" described Librarians and Information Science professionals are facing a changing environment. The reason behind changing is enhancement in technologies and potential for latest services which they bring. The study discusses that enhancement in technologies have changes the demands of users. Now a days; users visit with new prospects and demands of good quality services. This is why range and variety of information sources that librarians now deal with encompass print materials, CD-ROMs, online bibliographic databases in a variety of formats, full text databases, electronic journals; digital resources supplied form a various vendors or accessed from website. Each of the formats needed both basic and standard abilities for information explore.

Anuradha (2000) in his study "Automated Circulation System Using Visual Basic 6.0" discussed and highlighted the characteristics of an automated circulation system developed using the programming language visual basic. It describes some important flowcharts for automated circulation system, flowchart for book entry program, flowchart for membership form, circulation management, flowchart for book entry form, flowchart of membership creation form, flowchart of transaction form, flowchart of book detail form etc.

Clarke (2000) in "Open Source Software and the Library Community" included an investigation on open source software. The study describes that open source software is not a new development, the potential of OSS has recently reached the awareness of the

mainstream media and community. It depicts comparison between the "hacker culture" of the programming world and the traditional "gift culture" of the library community. Supports of Open Source Software (OSS) have seen as a positive step for the library community as it builds on the community's strengths while minimizing its weaknesses.

Vasantha and Mudhol (2000) in their study entitle "Software Packages for Library Automation" described how to make possible computer configuration and library automation. In this study clearly describe about the selection of software packages, it's a very important task for each and every type of libraries. It also explains how to select the best library management software.

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Chapter- 3

Central Universities in North India: A Profile

Chapter- 3

Central Universities in North India: A Profile

3.1 Introduction

This chapter is a description about the Central Universities and comprises a brief introduction about North India. However, the study is limited to libraries; hence the chapter depicts a brief introduction about the library, the library staff, available collections, diverse sections, automation status, library software being utilized and the future plan of Central University Libraries in North India.

3.2 About North India

North India forms the largest region in country covering a vast area ranging from the mighty peaks of the Himalayas embracing the great flat fertile plains of the Ganges valley and the upland plateaus of the northern Peninsula. This enormously diverse landscape is home to an equally widespread multitude of population ranging from those of the Mongolian and Tibetan descent in the Leh and Ladakh region to some of the earliest of India's settlers, the tribal people. Concurrently, North India has emerged as the country's rapid and fastest growing towns and cities with Delhi being the most important metropolitan city in North India. The state of Delhi has turned out to become the starting point for most visitors travelling to India. Centrally located to the northern region and well connected with all parts of the country, it has presently developed with a vast infrastructure accommodating an international style and facilities of a modern and

sophisticated capital. Although most of its densely populated quarters still demonstrate all the signs of urban poverty and deprivation, which successive governments have not been able to remove **(North India Tours, n.d.)**.

The vast region of North India covers seven states of the country such as; Delhi, Haryana, Himachal Pradesh, Jammu & Kashmir, Punjab, Uttarakhand and Uttar Pradesh. The map of North India that shows the above mentioned states as:

(Map of India, n.d.). **Figure: 3.1: Map of North India**

3.3 Central Universities in North India

The details of the Central Universities located in North India are listed in the table given below:

Table: 3.1: List of Central Universities under study

Name of the University	Est. Year	Website
Aligarh Muslim University (AMU)	1920	http://www.amu.ac.in
Allahabad University (AU)	1887	http://www.alldunivpio.org
Babasaheb Bhimrao Ambedkar University (BBAU)	1996	http://www.bbau.ac.in
Banaras Hindu University (BHU)	1916	http://www.bhu.ac.in
Central University of Himachal Pradesh (CU-HP)	2009	http://www.cuhimachal.ac.in
Central University of Haryana (CU-HR)	2009	http://www.cuharyana.org
Central University of Jammu (CUJ)	2009	http://www.cujammu.in
Central University of Kashmir (CUK)	2009	http://www.cukashmir.ac.in
Central University of Punjab (CUP)	2009	http://www.centralunipunjab.com
University of Delhi (DU)	1922	http://www.du.ac.in
Hemwati Nandan Bahuguna Garhwal University (HNBGU)	1973	http://www.hnbgu.ac.in
Indira Gandhi National Open University (IGNOU)	1985	http://www.ignou.ac.in
Jamia Millia Islamia (JMI)	1920	http://www.jmi.nic.in
Jawaharlal Nehru University (JNU)	1969	http://www.jnu.ac.in
South Asian University (SAU)	2010	http://www.southasianuniversity.org

(University Grants Commission, 2013)

3.4 Profile of the Central Universities and its Libraries

The present study covers 15 Central Universities. A brief introduction of these Universities and their libraries are described in detail.

3.4.1 Aligarh Muslim University

Established in 1920, Aligarh Muslim University (AMU) occupies a unique position amongst universities and institutions of higher learning in the country and evolved out of the Mohammedan Anglo-Oriental College (MAO College) which was set up in 1877 by the great visionary and social reformer, Sir Syed Ahmad Khan. Aligarh Muslim University spread over an area of 467.6 hectares invites more than 300 courses in both traditional and modern branches of education. Students come from various parts of the country as well as from other countries; especially Africa, West Asia and Southeast Asia. In some of the courses, the seats are reserved for students from countries from SAARC and Commonwealth. The University is open to all, irrespective of caste, creed, religion, community or gender. The University ranks 8th among the top 20 research universities in the country. It has more than 28,000 students, 1,342 faculty members and around 5,610 non-teaching staff. At present, this University is comprises twelve faculties, ninety eight departments of various disciplines, three Academic and fifteen Institutions & Centers. One of the most special features of the organization is that most of the staff, both teaching/ non-teaching reside in the campus along with nineteen halls of residence for students including eighty hostels.

In addition to above, the conventional Under Graduate and Post Graduate courses in Humanities, Sciences and Social Sciences keep pace with the Nation. The University

includes the Zakir Husain College of Engineering and Technology, Dr. Zia-ud-din Dental College, Jawaharlal Nehru Medical College, Food Craft Institute, Institute of Ophthalmology, Inter-disciplinary Biotechnology Unit, Department of West Asian Studies, Centre of Advance Study in History, Centre for Wildlife, Department of Islamic Studies, Centre for South African and Brazilian Studies, Woman's College, Academic Staff College, University Polytechnic and Ajmal Khan Tibbiya College separately for boys and girls.

During the year 2011, the University started two more Centers of Study outside Aligarh which were opened in West Bengal and Kerala State. At present these centres are offering MBA and Integrated Law courses. The university maintains one primary school as well as seven high schools including one for visually challenged persons and two for senior secondary schools combined with boys and girls. It also offers courses in Oriental, Indian and Westerner Languages with the medium of English.

It would be pertinent to mention that games and sports have always been a distinctive feature of the AMU. The Cricket, Football, Hockey, Tennis, Basketball, Skating and Horse Riding teams have excelled at the inter-University level. In fact, this is the only University with a Horse Riding Club. It is proudly an Islamic and an Indian institution which is a living symbol of the composite culture of India and a bulwark of its secular principles **(Aligarh Muslim University, 2014)**.

3.4.1.1 Maulana Azad Library

Maulana Azad Library is the Central Library of Aligarh Muslim University and is well known throughout the world for its invaluable collections of textbooks, manuscripts and

rare documents available in oriental languages. Apart from the vast collection, the library provides educational and research benefits to the user's community and its resources are consulted by scholars from all over the country and abroad. With its largest collection of printed Urdu books, it serves as a National Library of Urdu for scholars.

The foundation stone of the Library was laid by Lord Lytton, the Viceroy of India in 1877 and in the initial period, the Library was named after him as the Lytton Library. Pt. Jawahalal Nehru, the then Prime Minister of the country laid the foundation stone of the present Library building in 1955, who visited the University Library again in 1960. The eight storied building of the library is surrounded by 4.5 acres of land. During the year 1960, the library of the University was named after the first Education Minister of Independent India, Mohibuddin Ahmad who was also popularly known as Maulana Abul Kalam Azad **(Maulana Azad Library, 2014)**.

Rare Collection: The Library having an invaluable collection of rare manuscripts has around 15,162 manuscripts, of which one is written in the Koofi script that is claimed to be inscribed by Hazrat Ali, the fourth Caliph of Islam 1400 years before.

Library Timing: The reading room of the University has a seating capacity for 1150 people and is open every day for 18 hours and Sundays, except on few National and Religious holidays. The timings of the opening hours during the examination period are extended.

Libraries Working with AMU: In the University campus are three other libraries, such as; the Engineering College Library, Medical College Library and Social Science Cyber Library. These libraries have a rich collection of information sources.

Software: The AMU Library is working with LIBSYS-7 Software for automation purposes. The library is availing the services of the Center for Development of Advance Computing with the acronym, CDAC, for digitization of its manuscripts, rare collection and other information resources. The library is also using Anti-plagiarism Software for improvement of research work.

Services: The services of the library include provision for on-campus wide access to online catalogue (OPAC), online journals, two lakhs of E-books and other digital resources. The Library has installed a network of CCTV and an automatic security gate that restrict the incident of pilferage and book theft respectively **(Maulana Azad Library, 2014)**.

3.4.2 Allahabad University

Allahabad University is one of the premier institutions in India and was established in 1887 being one of the 4th oldest Universities after Calcutta, Bombay and Madras in India. Eventually, the credit for conceiving a large Central College at Allahabad, is due to Sir William Muir, the then Lieutenant Governor of United Provinces at that time to develop into a University/Institution of higher learning, The result of his initiative was the laying the foundation stone of the Muir Central College (named after him) on 9th December 1873.

On September 23rd, 1887, the Act XVIII was passed which established the University of Allahabad. The University of Allahabad also started as a degree proving institution of education in concurrence to the Universities of Bombay, Calcutta and Madras. During years between 1887 and 1927, there were at least thirty eight different

colleges and institutions of this area which were affiliated to Allahabad University. In between 1922-1927, the University had its internal and external wings, which were consequently divided from the University to provide the latter a purely unitary and residential character **(Allahabad University, 2014)**.

During the year 1892 to 1993, the University started to invest some of its capital under the securities of the Government. Further between the years 1899 to 1900, its reserve fund came up to Rs. 34000. Thus the University was now in a position to construct its own buildings for various departments, construction of the Senate Hall of the University, Law College and former Library building commenced in 1910 and they were completed in 1915 at a cost of Rs. 1167275. In the year 1911, a large number of new buildings sprung up in the Chatham Lines campus and in the Senate House Campus, such as, the Union Hall, old Guest House, building of the Commerce Department, N.S.S. building, Department of the Ancient History, Department of the Culture and Archaeology, Department of Political Science, Department of Oriental Languages, Department of Psychology, Hindi Bhawan, Department of Education, Department of Geography and the new Library building which are the new constructions in the University. Consequently, the University acquired land from the Cantonment Board and lately the house of the Late Dr. Bani Prasad has been purchased for the Department of Business Administration, Gandhi Bhawan and the Faculty of Law **(Allahabad University, 2014)**.

Since its establishment the Allahabad University has been concerned about women's education and purchased houses for Women's College Hostel and other

buildings adjoining the College at a price of Rs. 66,286. However, the classes for girls were started in the old building of the University and later the Priyadarshini Girls Hostel was opened up for the boarders. Ever since the University was established the Shatabadi Girls Hostel was constructed to accommodate several more boarders. Recently in 1873, with the inception of the Muir Central College efforts were consistently made to accommodate students coming from distant places and remote towns. During the year 1910 and 1911, the Muir Hostel (now named as Amar Nath Jha Hostel) was established; the Law Hostel (now named as Sir Sunder Lal Hostel) was finalized in the year 1914-1915; the Pandit Ganga Nath Jha Hostel (now known as the New Hostel) was completed in the year 1928. The Hindu Boarding House (now known as Hindu Hostel) was built during the year 1902-1922; which was formerly a simple building of the University.

During the same period, the Oxford and Cambridge Courts of the present Holland Hall were established. Consequently, P.C. Banerji Hostel, K.P. University College and Diamond Jubilee Hostels were established in the University. The Muslim Boarding House popularly named as Muslim Hostel is the oldest of all these hostels and was constructed in the year 1896-1897.After completing the millennium year, the University of Allahabad completes more than a hundred and thirteen years **(Allahabad University, 2014)**.

3.4.2.1 Central Library: Allahabad University

The Central Library was established in order to fulfill the essential requirements of students, research scholars and the faculty members of the University in educational, research activities of various disciplines. The University Library not only assists in

supporting the class room instructional programs, but also describes the horizon of knowledge in regard to the various research programs.

The University Library developed out of the library of the Muir Central College; which was established in the year 1872 and affiliated with the University from 1872 to 1922. It was subsumed in the University upon beginning its career as a teaching University. The foundation stone of the University Library and its building was laid on seventeenth of January in 1910 by Sir John Hewett. The Central Library of the University started its services in the year 1916. During the years between 1946 and 1947, the father of Library Science in India, Dr. S.R. Ranganathan, was invited to suggest ways and means of improving the library of the University. Dr. S.R. Ranganathan submitted the development plan in March 1947 for its improvement and the Plan was published by the University in the same year. The contents of the report covered a wide range of activities meant for the improvement of the overall library status, such as, the library building, staff, finance and other relevant activities. During the period, a special committee was constituted by Dr. S.R. Ranganathan to assess the library development plan. Finally the committee mentioned that the building of Central Library was inadequate which was constructed in 1913-1916. It suggested the most suitable activity would be to erect a new standardized building. The committee recommended the adaptation of the Darbangha Hall into a reading room for five hundred graduate students including two hundred and fifty on the ground floor and an equal number of graduate students on the first floor of the building. In recent years, it was felt that the space in Darbhanga hall was insufficient to store the reading material and provide library services due to the growth of the users as well as

resources. Finally the building of the Central Library Building was constructed in the year 1973.

Collection of the Library: The Central Library having a vast collection of 6,89,060 books & bound volumes of journal, 461 current journals, 11223 online journals, 16375 theses, 890 CD/DVDs, 16 databases, 29 popular magazines and 17 newspapers in addition to the significant holdings of books, magazines, journals and other documentary resources, the library has a sizable collection of rare articles of historical value and considerable research apart from its archival important like decent collection of Coins of Early Modern and Medieval periods of Indian History. It also household Manuscripts and rare collections; which are proposed to be photographed and catalogued for ready availability to research scholars.

The Central Library uses the Dewey Decimal Classification (DDC) system for classification and Anglo American Cataloguing Rules-II edition (AACR-II) for the purpose of cataloguing documents (Books, Journals and other reading materials). The LIBSYS-4 Software is in progress to create a database of documents and to provide various library services. A database is also being prepared of Ph.D. theses submitted to the University. The library has taken an initiative to digitize all old documents, which is currently in progress. It has already digitized about twenty five thousand (25, 000) text books with UDL project being carried out at IIIT, Allahabad under the Government of India. To access the e-resources, efforts are being to create a digital library laboratory with sufficient equipment for digitization of information resources.

Library Timing: The Central Library is open from 8.00 AM to 8.00 PM from Monday to Saturday throughout the week except on Sundays and the holidays as per Central Government Rules. The membership of the library is open for all members, such as; students, research scholars, teaching staff, officers, and other employees of the University. The Library permits faculties and research scholars other than the University for the purpose of visiting the library and research on production of proper identity/ recommendations from concerned authority of their organization.

Library Services: The library also provides a variety of services, such as, Reference Services, Reading Services, OPAC Searching, Lending to Departmental Libraries, Photocopying Services, Internet related search facilities for on-line access to journals that are available in the Database which is searched through INFLIBNET, INDEST, DELNET, CD Writer and Print-out facilities for downloaded data **(Allahabad University, 2014)**.

3.4.3 Babasaheb Bhimrao Ambedkar University

Babasaheb Bhimrao Ambedkar University is an 'A' grade library accredited by the NAAC in 2015. It was established in 1996 through an Act of Parliament, 1994. It was started with the objectives of promoting higher education and research facilities in varied sciences ranging from social sciences, frontier areas of technology to other allied disciplines. At present, the University is offering Under Graduate courses, such as, B.Tech, BBA, LLB and some certificate courses. The academic programs of the university commenced that had potential employment potential and relevance for the

development of the Indian Society. Currently, the University is running with eight functional Schools comprising of twenty functional departments:

1. The School for Ambedkar Studies consists of the Department of Economics, Department of Political Science, Department of History and Department of Sociology.
2. The School for Environmental Science comprises of the Department Environmental Science.
3. School for Bio-Sciences and Bio-technology consists of the Department of Bio-technology, Department of Applied Animal Science, Department of Pharmaceutical and Department of Applied Plant Science.
4. The School for Information Science and Technology that includes the Department of Library and Information Science, Department of Mass Communication and Journalism, Department of Computer Science and Department of Information Technology.
5. The School for Physical Sciences has the Department of Applied Chemistry, Department of Applied Physics, Department of Applied Mathematics and Department of Applied Statistics.
6. The School for Legal Studies consists of the Department of Law and Department of Human Rights.
7. The School for Home Sciences contains the Department Human Development and Family Studies.
8. School for Management Studies.

At present these departments of the aforesaid schools are offering Post-Graduate and Ph.D. programs. A few of them are also offering Under-Graduate Courses. There is an online entrance test conducted for admission to the University. The entrance test of the University is being conducted on an All India level at different centers **(Babasaheb Bhimrao Ambedkar University, n.d.)**.

In addition to the above departments, some fresh Under-Graduate departments have opened in the 12th Five Year Plan. The University has created an excellent infrastructure, such as the Administrative Block, School buildings, Women's' Cell, Day Care Centre, National Cadet Corps (NCC), BBAU Service Scheme, Laboratories which include Computer laboratories, Guest Houses, Students Hostel, Vice Chancellor's residence, staff quarters inside the Campus during the 9th, 10th and 11thFive Year Plans with the active support of the University Grants Commission (UGC). Further the University is developing additional infrastructure in the 12thFive year Plan for conducting more academic programs. During the same period, some buildings have been constructed and a few of them are under construction, such as, the Central Library Building, University Auditorium and Ambedkar Bhawan.

3.4.3.1 Central Library: Babasaheb Bhimrao Ambedkar University

The professional foundation for the library services of Babasaheb Bhimrao Ambedkar University was laid in January 1998. The Central Library inherited approximately a 1000 reference books/documents acquired by the University and further a 1000text books/documents in Hindi donated by the UP Bhasha Sansthan programs.

During that period, these books were shifted in two rooms allotted by the University on the second floor of the Administrative Building. The Central Library of the University has been established to provide information and knowledge resources to assist in education and research. It works as the Main Learning Resource Centre of the University to increase educational and information needs of teaching staff, students, research scholar and the non-teaching of the University. It also provides information needs to outsiders on providing a valid identity card issued by a competent authority.

At present, the Central Library has established its own separate building at a central place in the University. The Central Library of the University has been named as Gautam Buddha Library which has been shifted to its own building during the year 2013.

The reading room of the library remains open from Monday to Saturday from 8:00 AM to 8:00 and the issue and return of books takes place from 9:30 AM to 5:00 PM for its readers. The readers who need to access Library collections are welcome for their information and research requirements. The right to use the Library is reserved for enrolled students. All the students, teaching staff and non-teaching staff of the University are eligible for membership of the Library.

The Central Library has collections more than 31,000 books, 500 bound volumes of journals, 5,000 online journals, 158 theses and dissertations, 500 CD/DVDs, 15 newspapers and various e-databases. The Central Library provides access of some important databases like; Springer and JCCC links through UGC-INFONET consortium. These databases can be searched through links available on the library webpage. It also provides links to some important bibliographical databases. It is the primary

responsibility of the library to provide the latest information to its users. To fulfill the aforesaid responsibility, the library provides Internet search facilities to its users on a limited number of computer systems **(Babasaheb Bhimrao Ambedkar University, n.d.)**.

The collection of reference and information sources comprises reference tools, such as, Handbooks, Bibliographies, Dictionaries (General and Special), Directories, Encyclopedias (General and Subject), Thesauri and Guides to literature.

The Central Library of the University has ambitious future plans like Library Automation, installation of RFID technology and self-circulation.

3.4.4 Banaras Hindu University

Banaras Hindu University (BHU) is one of the most famous and reputed temple of learning, situated in the holy city of Varanasi in India. The University was established under the Parliamentary Legislation – B.H.U. Act, 1915 as a creative and innovative institution. The University was founded by the greatest educationist and politician, Pandit Madan Mohan Malviya, during the year 1916 with the avid support of the great personality, activist, writer and orator, Dr. Annie Besant, who perceived it as the University.

The main campus of Central University is spread around 1300 acres and another campus of the University at Barkachha in Mirzapur Utter Pradesh covering an area about 2700 acres which will soon commence its operations.

The University comprises of three Institutions, fourteen faculties, one hundred forty four interdisciplinary centers, a constituent college for females and three constituent

schools that include all branches of Sciences, Social Sciences, Humanities, Technology, Medicine, Arts and Fine Arts. The University has ten departments under a Special Assistance Program, six Centers relative to advanced studies and a number of Specialized Research Centers. Some of the most well-known reputed degree colleges are affiliated to the University. The famous museum of the University, popularly known as Bharat Kala Bhawan has a treasure trove of rare collections. A well-equipped hospital with a capacity of 927 beds has been established inside the University Campus.

Banaras Hindu University provides a wide range of facilities for sports and extra curriculum activities. It has excellent playgrounds, a large auditorium and several auxiliary services and units like the Publication Cell, Printing Press, Employment and Information Guidance Cell, Subsidized Mess, Fruit Preservation Center, Road Maps of the University, Green Environment and enhanced Security. At present, the strength of the University family consists of about 15,000 students in various streams of Life Sciences, Social Science, Humanity and Technology; nearly 1,700 teaching staff and about 8,000 Administrative as well as Non-teaching staff. A large number of students come to study in the University from various countries, such as, the U.S., Europe, Asia, Africa, Middle East and a large number of countries across the globe **(Banaras Hindu University, 2013)**.

3.4.4.1 Central Library: Banaras Hindu University

The Library System of Banaras Hindu University is the largest University Library System in the country. Commencing with a small yet precious donated collections, the library grew by leaps and bounds with wonderful contributions/donations of literature of well-

liked persons and families, collections from various renowned personalities and families. It also includes the precious collections of Lala Sri Ram, Jamna Lal Bajaj, Batuk Nath Sharma, Roormal Goenka, collections from the Tagore Family and collections of the Nehru Family apart from scores of others and procurement of books and journals out of the regular fund. This has resulted in the University having a collection of around 60,000 volumes during the year 1931. Further the donation of personal and family collections to the library continued as late as the 1940s.

Banaras Hindu University Library System: At present, the Banaras Hindu University Library System consists of a Central Library named Sayaji Rao Gaekwar Library, three Institute Libraries, eight Faculty Libraries, twenty five Departmental Libraries, with a total collection of over 13 lakh volumes to provide efficient services to the students, researchers, faculty members, non-teaching staff and administrative staff of14 faculties consisting of 126 subject departments of the University.

There are four institutional libraries working under the BHU Library System: Institute of Technology, Institute of Medical Sciences, Institute of Agricultural Sciences and Mahila Mahavidyalaya.

Library Collection: The status of BHU Library is proud of its rich collection. It has 10,95,181 books, 560 current journals, 1,38,914 bound volumes, 12,812 Ph.D. theses, 7,233 manuscripts, 3,632 rare collections, 11,142 online journals, 10 databases and 41,738 e-books.

Library Services: The University Library also provides some specialized services like Database search through DELNET, INFLIBNET and Electronic Document Delivery

Service to its users. For accessing the library resources, users can search through online catalogue (OPAC) within the campus and there is a facility to access the resources for external users that is provided by the library **(Sayaji Rao Gaekwad Library, n.d.)**.

3.4.4.2 The Cyber Library

The Cyber Library of the University is now home to perhaps Asia's largest Library within a University in itself. It has nearly 500 workstations and 455 computers to provide access to over 14,500 online journals, e-books and a variety of other materials to the user community. These e-books and e-journals have been already subscribed by the BHU.

The library had been financed primarily by Shivaji Rao Gaekwad then the Maharaja of Baroda and is thus named after him. The building of the Cyber Library has been provided by the University; while the resources and equipment have been provided by Shivaji Rao Gaekwad. The total cost of the project is 10 crore rupees. The task of this project started around three years ago and the first phase was completed in the month of March in 2013. The Cyber Library Section is spread over an area of approximately 1.5 acres and the work platform is a double-storey building. On production of a valid identity proof issued by a competent authority, visitors and outsiders are allowed to avail the facilities and services **(The Indian Express, 2014)**.

3.4.5 Central University of Himachal Pradesh

Central University of Himachal Pradesh was established under the Central Universities Act, 2009 enacted by the Parliament. The Prime Minister (Dr. Manmohan Singh), in his address to the nation on 15th August 2007, announced to open a Central University in each of the Indian States that did not have a Central University so far. Subsequently, the

11th five year Plan provided for the establishment of 16 new Central Universities in the country. Accordingly, as per the Act of 2009 (No. 25 of 2009) of the Central University; which was received through a Presidential assent on 20th March in 2009, provided for the establishment of the University in the State of Himachal Pradesh. The University is funded and controlled by the University Grants Commission, New Delhi. It became functional and started its education program with the joining of First Vice Chancellor on 20th January 2010.

Himachal Pradesh Central University strives for Inclusive Access to Excellence in Advanced Education and Research to emerge as one of the leading Universities in the Country at par with the best Universities of the World due to its Curricular Framework, Program Offerings, Education, Research, Publications and Integration. The area of the University is spread over a massive area of about 150 acres with its campus at Dharamshala and a 900 acres campus in Dehra Tehsil, District Kangara which will have 17 Schools of Studies with nearly 90 Departments of Studies and about 50 Centres of Studies for various disciplines **(Central University of Himachal Pradesh, 2012-13)**.

The Central University of Himachal Pradesh will have two distinct campuses located in Kangra District at Dharamshala and Dehra Tehsil. The University has already been acknowledged and a proposal of acquisition of land for both the Campuses for clearance under the Forest Conservation Act (FCA) has been approved by the Government of Himachal Pradesh. The University has already been submitted the proposal to the Ministry of Environment and Forest under the Government of India. The Permanent Campuses of the University shall commence as soon as the Forest

Conservation Act Clearance comes in and the land is officially handed over to the University for Construction as well as the development of the Campuses.

The infrastructure and permanent campuses of the University are pending due to the development and presently the University is functioning from its temporary campuses encompassing the following facilities:

Camp Offices of the University, which presently serves as the Headquarters of the University is situated in the Sanskriti Sadan popularly known as Writers' Home at Dharamshala in the Kangra District. The following offices, such as, the Vice Chancellor, Registrar and Finance Officer are located in the Camp Office of the University **(Central University of Himachal Pradesh, 2012-13)**.

3.4.5.1 Central Library: Central University of Himachal Pradesh

The professional foundation of the library of Central University of Himachal Pradesh with the main objective for providing library services to its users was started in 2009. The Central Library is situated on the 2nd floor of the University building. It was then (during a survey) housed in two rooms with an area of about 500 sq. meters.

The Central Library has collection of 12,082 books, 70 print journals, more than 5,000 e-journals, 44 theses and dissertations, 100 CD/DVDs, 09 newspapers, 165 bi-lingual dictionaries and 13 databases of various disciplines.

The users who need to access library collections, both print and non-print resources are eligible to use these resources for their information and research needs. All the students, faculty members and non-teaching staff of the University are entitled for membership of the Library **(Central University of Himachal Pradesh, 2012-13)**.

The Library is open to its users for charging/discharging of books and uses other library resources from 9:00 AM to 5:30 PM. The Library also provides search facility of library resources using OPAC during library opening hours. The Library is using SOUL 2.0 for automation of the library **(Annual Report, Central University of Himachal Pradesh, 2012-13)**.

3.4.6 Central University of Haryana

Central University of Haryana is established under the Central Universities Act, 2009 of the Parliament. This University is one of the 15th Central Universities established by Ministry of Human Resources Development, Government of India; during the 11thFive Year Plan (2007- 2012). The University is totally funded by the University Grants Commission. The permanent campus of the University is spread over 488 acres at Jant-Pali village in Mahendergarh District of Haryana State. At present, the University is running its academic operations and activities; further the infrastructure and development of the University including erection of buildings are under construction.

The University devotes itself to its "Vision and Mission and Strategies" to accomplish the same by devising a responsible, transparent and reflective organizational structure. The University is engaged in teaching methodology and imparting holistic education that promotes innovation, creativity and excellence. The objectives of the University Library are as follows:

- Disseminate information and knowledge resources by providing instructional and research facilities in such branches of learning.

- Take appropriate and suitable measures for promoting modernization and innovation in educational activities such as teaching-learning process and inter-disciplinary studies, research and its relevant.
- Train and educate library users for the development of the country.
- Devote special attention to the improvement of the social and economic conditions and welfare of the people, their intellectual, academic and cultural development **(Central University of Haryana, 2013)**.

3.4.6.1 Central Library: Central University of Haryana

The Library of Central University of Haryana promotes knowledge generation and application through effective dissemination to keep the users aware on the latest developments in the field of course curriculum, research and related areas in and around the world. The mission of the library is to lead the collaborative development as well as growth of an academic information arrangement that increases and meets the transforming needs of preservation, and dissemination to the users and the application of knowledge, critical thought and creativity. The Central University Library System has more than 3,300 volumes in multiple disciplines to serve the academic community. The Library includes facilities such as advanced web activities with the INFLIBNET subscription as well as 4,869 high quality e-Journals being made available through the campus network to the faculty members, research scholars and students. The library also promotes Open Access e-resources. The Library collection consists of 13,400 Books with Dust-free Compactor, Reference Books, Text Books, 145 Print Journals, 15 Newspapers, 7,428 e-Journals & Databases, 55 theses and dissertations, 30 CD ROM/DVDs.

The Central Library is working on library automation with e-Granthalaya Software. It also started the digitization process that is in an initial stage. The Library is purely meant for the use of faculty, research scholars, students and non-teaching staff of the Central University of Haryana.

The privilege of borrowing books from the library is restricted only to the employees of the University both regular/permanent. They must be present in-person and to produce valid ID card at the time of borrowing books. The different membership categories, number of books eligible and their loan period is as follows:

Teaching staff	**Staff**	**Scholar (M.Phil/ PhD)**	**Students (PG)**
10 Books	02 Books	06 Books	04 Books
for 30 days	for 7 days	for 15 days	for 10 days

The services and facilities being provided by the library, such as, Circulation and Reader Services, Issue/Return, Renewal of Books, Reference and Enquiry Service, Library Orientation, Air-conditioned Reading Room, Air-conditioned E-Library, New Arrival Services, New Clipping Services, Collection of Information from various newspapers published about CUH, e-Resources/Access to full-text on-line journals and databases through INFLIBNET **(Central University of Haryana, 2013)**.

3.4.7 Central University of Jammu

The Central University of Jammu was established through the Central Universities Act and came into existence on August 08, 2011 with the joining of Dr. S. S. Bloeria as the first Vice-Chancellor. The University commenced its first academic session in the year 2011 with three Post Graduate Programs in Applied Mathematics, Economics and English. The University started the aforesaid courses at its temporary Academic Block- I

at Sidhra By-pass road, Jammu & Kashmir. The University added five Post Graduate Courses in its next academic session during 2012-2013, such as: Computer Sciences, Environmental Sciences, Human Resource Management, Educational Studies and Travel & Tourism Management in its Temporary Academic Blockat Sainik Colony. Further in the third academic session since 2013-2014, all the departments are functioning from its Temporary Academic Block.

The University has planned to start four fresh post graduate courses which have commenced in the forthcoming academic session in 2014-2015. The courses like Social Work, National Security Studies, Public Policy & Public Administration and Mass Communication & New Media. It also offers research programs, such as, an Integrated M.Phil/ Ph.D. program in eight different disciplines. The University carries out its administrative functions from its Head Office at Trikuta Nagar of Jammu. The independent campus of Central University of Jammu is under construction and it is at an approximate distance of 25 Kilometers. **(Jammu Central University of Jammu, 2014)**.

3.4.7.1 Central Library: Jammu Central University of Jammu

The Library of Central University of Jammu has its functional set-up in the Temporary Academic Block, which is stacked with nearly 6,500 text books and reference books of various disciplines. The University also subscribes more than 10 magazines and 10 newspapers related to the disciplines of studies being offered at CUJ. The Library has a computer work area with internet browsing facility.

The University Library is in the process of subscribing to various journals of International and National repute. The Library has grown exponentially over the last 3

years by providing Value Added Services to its student communities, faculty members and supporting staff **(Jammu Central University of Jammu, 2014)**.

3.4.8 Central University of Kashmir

Central University of Kashmir was established in March 2009 with the appointment and joining of Professor Abdul Wahid Qureshi. A noted academician and former Vice Chancellor of University of Kashmir he joined as the First Vice Chancellor of Central University of Kashmir. Formerly, the University was known as the Central University of Jammu and Kashmir. The administrative office was setup at Baghi-Hyder, Hyderpora in May 2009 and started functioning with the staff on deputation as well as on a contract basis. Various appointments to administrative posts including First Registrar of the University, Deputy Registrar and Assistant Registrar were made in the month of June in 2010.

The new Campus of the University was setup at Sonwar in the month of August in 2010. A boy's hostel has been established at Sonwar to facilitate the students coming from different places to study in the University. In recent years from Academic Session 2011-2012; 3 new Masters Programs in Economics, Convergent Journalism, Mathematics and one Integrated B.A.-LLB courses were offered. The Academic Block of the University along with a boy's and a girl's hostel was constructed at Magarmal Bagh, Srinagar. In the academic session 2012-2013, three Masters Programs in Education, Urdu and Tourism Management were launched and in the same session two Integrated M.Phil. /Ph. D. in Management, English programs and LLM programs were also offered. Further in the next academic session, one more Master's Program in Political Science was

started. It has been planned also to offer innovative courses for complimenting the efforts of the already existing Universities in the State of Jammu and Kashmir. The recruitment of the teaching as well as non-teaching and the admission of all the courses will be on a National level following the reservation policy of the Central Government of India. The University organizes entrance tests for admission in all the courses at many centers across the country **(Central University of Kashmir, 2013)**.

3.4.8.1 Central Library: Central University of Kashmir

Central University Kashmir has setup a Central Library at its Transit Campus Srinagar to provide access of books, journals and other information sources to its faculty members, students/ research scholars and the non-teaching user community. A few months ago, the library has procured more than 2500 Text and Reference books on various subjects like Information Technology, Management, English Literature, Economics, Law and Mathematics. The Central Library has also started a Career Corner and procured books related to various Competitive examinations of national and international repute for the students who desire to appear in the Competitive examinations, such as IAS, PCS, IFS, KAS, GRE, GMAT, NET, SET, MAT and CAT. In order to provide updated information in various fields; it is subscribing to various journals, magazines, newspapers and other serial publications. The University Library provides access to about 500 e-journals and few electronic databases under the UGC-INFONET Digital Library Consortium. At present, the University Library accesses various online journals from the following publishing agencies such as; Cambridge University Press, JSTOR, JCCC, ISID, Springer Link and Wiley-Blackwell and Oxford University Press.

The Central Library of the University is currently providing various services such as Circulation Service, Current Awareness Service (CAS), Selective Dissemination of Information (SDI), E-Resources (Journals and databases) through UGC INFONET Digital Library Consortium and Reprographic/Photocopy services.

The Library of Central University of Kashmir is expected to start the following activities in near future such as:

- Automation of Library
- Subscription of e-books from different international publishers
- Web OPAC
- Implementation of RFID Technology
- Documentation Centre
- Formation of Institutional Repository
- E-Clipping services of National and International Newspapers etc. **(Central University of Kashmir, 2013)**.

3.4.9 Central University of Punjab

The Central University of Punjab, Bathinda was established in the year 2009. An assent was received from the President of India on 20th March 2009 to establish a Central University in the State. This newly set up Central University is poised to in scribe a new alphabet on the academic horizon of India. It is one of the most significant universities amongst the recently set up chain of Central Universities established in the educationally backward areas of the country. The University is gearing up to offer appropriate institutional leadership to the emerging demands of parity, access, relevance and

excellence in the mainstream. It has already flexed its muscles and initiated its first academic session to contribute towards research and development.

The University would creatively and dynamically respond towards the instable paradigms in education in tune with the changing needs of the community. This inclusive, holistic and multi-subject disciplinary University would provide an academically ambient environment to develop technologically superior persons. It also aims to sponsor goal-oriented and time-bound research and development projects of various types for users like companies, industries and other relevant organization in India and abroad.

By creating a community of faculty members, scholars and researchers dedicatedly absorbed in academic investigation, research, exploration and development, testing and consultancy, the University is going to be an ultra-modern and futuristic seat of higher learning. It would have a world-class infrastructure and would be eco-friendly as well as optimally utilized through the potential to absorb and emerge appropriate technologies and skills. It is also endeavoring to be an independent and hassle-free space to construct world class knowledge infrastructure, innovative and bright ideas that would germinate and grow wings.

The Central University of Punjab is creating supporting and stimulating conditions and opportunities whereby one can acquire, develop, discover and interact. As a result, the University would be an exciting, healthy, safe, motivated and a happening place through eco-friendly environment, Wi-Fi connectivity, ignited and innovative teaching staff, world class research labs, well-automated libraries, excellent playgrounds,

research centers and other world class support systems. The University wishes to present participatory delivery techniques facilitated through seminars/conferences, discussions, online support, multimedia, web, live projects, demos, field studies, team demonstrations and skill workshops.

The University would revel in its diversity and shall be exposed to each and every one the world over, irrespective of nationality, class, color, creed, caste, and religion. Well-trained manpower and technological concerns are the bottom-line of this organization. It is endeavoring to develop human resource that would be morally upright, intellectually well-informed, physically well-developed, socially concerned, emotionally balanced and culturally bloomed.

The Central University of Punjab would carve out and maintain its national character and global outreach through its instructional and research programs. It is planned to be a multi-facility and multi-faculty University enshrining state-of-the-art arrangements for teaching, research and learning. It will bring into public domain the global technological trends for the benefit of culture. In April, 2009, the University started functioning from its Camp Office. The Camp Office happens to be the residence of the Vice Chancellor, it shifted to its City Campus from November 2009 and spread over an area about 35 acres and above. The Main campus of the University is coming up on 500 acres of land near the town of Bathinda **(Central University of Punjab, 2010)**.

3.4.9.1 Central Library: Central University of Punjab

The Central Library of this University is fully air-conditioned and equipped with elegant modular stuff, RFID (Radio Frequency Identification) and Electromagnetic Security

(EM) systems to facilitate self-issue, return and renewal. For the purpose of security and ensure safety of books the library has installed 20 CCTV cameras.

The Central Library has approximately 14,190 books on its racks and subscribes to 85 international and national print journals, 10 magazines of various disciplines and 16 newspapers to its users. It also provide access over 8,505 full text online journals which are available under several bibliographic databases and full text resources, including the 'UGC- INFONET' program, Science Direct, Springer, J-STOR, Wiley-Blackwell, SAGE, Taylor & Francis, Project Muse, ACS, IEL Online, Science Online, Institute of Physics, Oxford University Press and Cambridge University Press.

The Central Library provides access to periodical collections of 22 University libraries in India through JCCC, World Bank E-Library, UGC INFONET and has an institutional membership of DELNET (Developing Library Network). The University Library provides reprographic services with the latest state-of-the-art photocopying machines and classy scanners, such as V-cradle planetary scanner for automated scanning that is available for users. The entire bibliographic collection of library is in an online electronic database that can be search through OPAC. The links to various e-resources have been subscribed by the CUPB Library: Science Direct, Wiley-Blackwell Publishing, JSTOR, Springer Link, Taylor and Francis, Project Muse, JCCC, Portal Science/AAAS, SAGE, Economic and Political Weekly etc. **(Central University of Punjab, 2010)**.

3.4.10 University of Delhi

Established in 1922, the University of Delhi is one of the premier Universities in the country. The University is known for its high standards in teaching, learning and research

activities. The University of Delhi provides various courses at Under Graduate, Post Graduate and research levels of education. The teaching and research methodologies have transformed this University as a role-model and path-setter for other Universities in India. The University has grown into one of the largest universities the country. Presently, the University consists of 16 faculties, 86 academic departments, 77 colleges and 5 institutes spread out at various locations in the State of Delhi with 1,32,435 regular students including Under Graduate: 1,14,494 Post Graduate:17,941 and 2,61,169 students including Under Graduate: 2,58,831, Post Graduate: 2,338 in non-formal education program. The status explains that it is the largest University System in the world **(University of Delhi, n.d.)**.

There are various prestigious colleges affiliated to Delhi University. Students throng the university and its colleges from all over the country as well as from foreign countries across the world to seek admission in these colleges.

3.4.10.1 About the University Library (Delhi University Library System)

Delhi University Library System (DULS) has a Central Library and a large number of libraries working with the various departments; such as the South Campus Library, the Arts Faculty Library, the Science Library, the Delhi School of Economics Library, the Institute of Management Library et.al. Presently the University Library System has about 600 employees at different levels **(Delhi University Library System, n.d.)**.

Library Collection: The libraries working under the Delhi University Library System has a rich and wealth of collections of various types of information resources. The data collected through the Central Library using questionnaire consists of about 16 lakh

books, 425 print journals, 62,000 bound volume of journals, 4,400 rare books both in print and e-form, 16,000 theses and dissertations in hard copy and digital form, 100 manuscripts, 1,600 CD/DVDs, 3,000 video tapes and 17 newspapers.

Libraries under Delhi University Library System:

There are a large number of libraries under the Delhi University Library System which are enumerated below:

Division Library	Central Library, Arts Library, Ratan Tata Library, Central Science Library, South Campus Library
Faculty Libraries	Law Library, Management Studies Library, Music Library, Education Library
Special Libraries	Braille Library, Computer Center Library, Audio visual Library, Bio-medical Research Library
Department Libraries	Chemistry Library, Chinese & Japanese Library, English Library, German and Romance Studies Library, Library and Information Sc. Library, Social Work Library, Botany Library, Physics and Astrophysics Library, Mathematics Library, Zoology Library, Evening Law Center (I) Library, Evening Law Center (II) Library, Non-Collegiate Woman's Board Library
Zonal Libraries	East Zone Library, West Zone Library, North Zone Library, South Zone Library

Table: 3.2: Libraries under Delhi University Library System

The Central Reference Library functions for 17 hours (08 A.M. to 01 A.M.) in a year and other libraries under the system remain open for 12 hours (08 A.M. to 08 P.M.) normally. The University alters the timing of different libraries and all the changes are made through information on the notice boards of the respective libraries.

The University Library System has made an impressive progress in the availability of web activity through subscriptions to a large number of high quality electronic databases being made available on the campus network to faculty members, students and research scholars. In addition to this activity, the University provides access to more than 20 databases through UGC-INFONET Digital Library Consortium. The Delhi University Library System also promotes Open Access to electronic resources and includes the Reference Sources, Bibliographic Sources, Statistical Sources and full Text Sources. A brief description of these resources also includes the Subject Coverage, Search Features, Database Services and Document Category. The system is continuously conducting innovative Information Literacy Programs for the benefit of students, researchers and the faculties. It has also expended extensive efforts in developing tutorials to make the community proficient in the use of WWW (World Wide Web). The OPAC of this system is also being strengthened in order that information can be provided to the right user at the right time. (**University of Delhi, n.d.)**.

3.4.11 Hemwati Nandan Bahuguna Garhwal University (HNBGU)

The Central University was named as Hemwati Nandan Bahuguna Garhwal University and was established on 01 January, 1973. It came into force with effect from 01 December, 1973 under the provisions of Uttar Pradesh State Universities Act. It was

named as Hemwati Nandan Bahuguna Garhwal University in 1989, in commemoration of the memory of a leading statesman of the country. Shri Hemwati Nandan Bahuguna was also known as the son of the soil and consequently the name of the University was changed being a Central University under the provisions of the Central Universities Act, 2009 and was published in the Gazette of India. It is among the 10 largest Universities of the country. At present, the University consists of 3 campuses and about 180 affiliated institutes and colleges (state run/aided, self-financed) and examining approximately 1,50,000 students every year, providing higher education services in 7 out of the 13 Districts of the State (**Hemwati Nandan Bahuguna Garhwal University, 2010)**.

The Hemwati Nandan Bahuguna Garhwal University is blessed with state-of-the-art research facilities along with some of the finest teachers having close academic relations with a number of premier institutions. The University invites a variety of higher learning courses and academic programs through 10 Faculties (**Hemwati Nandan Bahuguna Garhwal University, 2010)**. As a mark of the appreciation of its importance and achievements, the University has been upgraded as a Central University of the state of Uttarakhand.

3.4.11.1 Central Library: Hemwati Nandan Bahuguna Garhwal University

The Central Library of the University is an Information and Knowledge Centre which has rich resources in Sciences, Social Sciences, Humanities and Management. In the early years in 1973, the library came into existence and started with a few collections that existed in various disciplines of the University. However, new books are added to the Central Library annually.

The collection of the library is housed on a subject-wise basis on the ground floors under four major streams sections, such as, Social Sciences, Sciences, Humanities and Management. The Library contains 1,38,144 Books, 1,916 Volume of Journals, 100 Current Journals, 2,098 Theses, 150 Maps, 3,000 Post Graduate Dissertations of all the concerned subjects and 50 Atlases. The above library resources can be used during library timings from 10:00 AM to 05:00PM on all working days.

The Ground Floor consists of the Membership Section; Circulation Counter; Newspaper and Periodicals Display and Reading Hall; Reference books; Readers Services; Lockers for Students and Catalogue Cabinets; Librarian's Chamber; Librarian's Office; Book Acquisition Unit and Reference Books.

The 1st Floor of the Library building has bound volumes of Theses & Dissertations and collection of Rare Books. Further it also contains Information Browsing Unit for teaching staff; Research Scholars; Reading Room; Technical Section and a Digital Library.

Teaching Staff	**Staff**	**Scholar (M.Phil. /Ph.D.)**	**Students (UG&PG)**
15 Books	05 Books	05 Books	03+04 Books

The Reference Service is provided for each collection at the respective sections of the library. The facility of membership and Issue-Return Services are available at the Ground floor. Textbooks on all disciplines are kept at the Textbook Section. Inter-Library Loan and Document Delivery Services are also available in the library. The printed card catalogues, search facility of different collections are available on the ground floor.

The Xerox Facility is available in the library on a payment basis. Newspaper Clippings are available for the University **(Hemwati Nandan Bahuguna Garhwal University, 2010)**.

3.4.12 Indira Gandhi National Open University (IGNOU)

The Central University Indira Gandhi National Open University (IGNOU) was established in the year 1985. It has been playing a continuous role in build an inclusive knowledge society through inclusive education. IGNOU has made consistent efforts from time to time to enhance the Gross Enrollment Ratio by providing high-quality education in teaching and learning through the Open and Distance Learning Environment.

In the present time, IGNOU serves the educational aspirations of over 3 million students in India and abroad through 21 Schools of Studies and a network of 67 regional centers, 29 overseas partner institutions and 2,667 centres for learner support. IGNOU offers about 228 certificate courses, diploma courses, degree courses and doctoral programs with strength of nearly 810 teaching staff and 574 non-teaching staff along with about 33,212 counselors from various reputed professional organizations, higher education, industries and other relevant organizations.

IGNOU has the National Resource Centre for Open and Distance Learning of International repute. It endeavors to provide seamless access to sustainable and learner-centric quality teaching/ learning, capability up gradation and training to all by using innovative technologies and methods. The University also ensures convergence of existing systems for massive human resource advancement which is essential for promoting integrated national development and global acceptance. The Indira Gandhi

National Open University is committed to superior quality in teaching, research, training and extension activities. IGNOU has established the National Centre for Disability Studies and National Centre for Innovation in Distance Education to emphasis on specific learner community and develop the distance learning education structure. The council of Distance Education of the University provides support in maintaining and regulating the Open and Distance Learning system in the Country.

In the year 2004 on 20th September, with the launch of EduSat (a satellite dedicated to education) and the establishment of a Consortium inside the University, it has ushered in a new age of technology-enabled education in the Nation. The Regional Centers of the University and high enrollment study centers have been provided with active video-conferencing network and have made it possible to manage interactive digital content. A large number of foreign scholars from several countries visit the University for delivering lectures or to interact with faculty members **(Indira Gandhi National Open University, 2014)**.

Over the years, IGNOU has lived up to the country's expectations of providing education to the marginalized sections of community. However, facilities regarding teaching and learning are being provided to all the jail inmates across the country without any cost. A large number of students from Schedule Castes/Schedule Tribes have been admitted to various programs of the University.

3.4.12.1 About the Library: Indira Gandhi National Open University

The IGNOU Library is enriched with a vast array of collection books, periodicals and other related materials for the purpose of Distance Education throughout the country. The

main aim of the library is to provide assistance in teaching learning and research programs of the University by providing information and knowledge resources in both print as well as e-formats.

The Central Open University IGNOU operates through a three-tier system. It has 59 Regional Centres, 05 Sub-Regional Centres in different States and about 1,621 Study Centres spread out all over the country. The Headquarters of the University is situated at Maidan Garhi in New Delhi. The Library and Documentation Division is a hierarchical system with the Central Library at the University HQs followed by libraries which are working at Regional Centres (RCL) and Study Centres (SCL). The Central Library is the main library, which co-ordinates the effective functioning and development of Regional Centres and Study Centers. The Central Library and other related libraries are presently using the LIBSYS, KOHA and e-Granthalaya Integrated Library Management Software packages with all the modules for housekeeping operations of the Library. The users can search the Library resources using online catalogue from the LIBSYS Web OPAC.

The installation of RFID system is planned by the Central Library of IGNOU and there is another plan to convert the microform to digital format. At present, the library has a collection over 199 microfilms and 17,558 microfiches **(Indira Gandhi National Open University, 2014)**.

3.4.13 Jamia Millia Islamia (JMI)

Jamia Millia Islamia (JMI) is an institution primordially established in the year 1920 at Aligarh in the United Provinces in India. In 1988, Jamia Millia Islamia became a Central University through an act of the Indian Parliament. In Urdu language, Jamia Millia;

Jamia means an institution of higher education similar to a University and *Millia* refers to 'National'. Through the immense efforts of Mahatma Gandhi, the institution Jamia shifted its premises from Aligarh to Karol Bagh, a suburb in New Delhi during the year 1925. The foundation stone for a school building was laid on 1 March 1935 at Okhla in Delhi. All institutions of Jamia, excluding Jamia Press known as "Maktaba" and the library were shifted to the new campus during the year 1936.

The JMI started as a small institution in pre-independence India and at present is offering integrated education from nursery level to research in specialized disciplines. It is a saga of dedication, conviction and vision of a people, who worked against all odds and saw it emerging gradually and steadily. They "built up the Jamia Millia stone by stone and sacrifice by sacrifice," said Sarojini Naidu, the nightingale of India **(Jamia Millia Islamia, 2014)**.

University Grants Commission declared the Jamia as a deemed University in 1962. Thereafter the School of Social Work was established in 1967. Jamia started the Zakir Husain Institute of Islamic Studies in 1971 to honor Dr. Zakir Husain, the late President of India who passed away in 1969. The Bachelor of Engineering in Civil Engineering in Jamia Milia Islamia commenced in the year 1978. The faculties of Natural Sciences, Humanities and Languages, Social Science and the State Resource Centre were founded in the year 1981. JMI started Mass Communication Research Centre and the Centre for Coaching and Career Planning in 1983. A few specialized Faculties, such as, Engineering and Technology and Computer Centre of the University was established in

1985. Furthermore, the Academic Staff College and Academy of Third World Studies were established during the years 1987 and 1988.

The University was made a Central University of India in December 1988 by a Special Act of the Parliament of India. Among the list of the Faculties, the new faculties were added, such as; Humanities & Languages, Social Sciences, Natural Sciences, Engineering & Technology, Education and Faculty of Law during the year 1989. During the same year several new programs and courses at Under Graduate and Post Graduate levels were added in the University education system. In addition to the nine faculties, the Jamia has a number of centers of teaching, learning and research, such as, AJK-Mass Communication Research Centre (MCRC) and Academy of International Studies. It facilitates various Undergraduate and Postgraduate IT courses. The Jamia has a campus wide network which connects a large number of departments and offices under working **(Jamia Millia Islamia, 2014)**.

3.4.13.1 Dr. Zakir Husain Library (Central Library)

The name of Central Library of Jamia Millia Islamia University is Dr. Zakir Husain Library. The name was given after the ex-President of India (Late) Dr. Zakir Husain in the year 1973.The Jamia Library System includes the Faculty Libraries as well as Center Libraries. It has a rich collection of over 375000 information resources/documents in all major subject areas taught in the University and spread over an area of 23038 sq. feet. The Central Library caters to the academic needs of the University students, faculty members & research scholars by providing a rich collection. The available collection in the Library consists of books, journals, magazines, pamphlets, manuscripts and electronic

resources photographs. The library provides open access to users except rare collection/material. The Text Books Section also observes closed access system for issue and return.

Library Collection: Dr. Zakir Husain Library has a collection of about 3.75 lakh books and bound volumes of periodicals, 200 microfilms, subscribes to 1,100 journals and about 2,500 manuscripts. The library has reserved important collection like textbooks and documents, which are consulted in the library or can be issued for overnight. The Library has a rich valuable collection of source material on the history of freedom movement in the form of private papers of the eminent leaders, such as, Maulana Mohammed Ali Jauhar, and Hakim Ajmal. Many eminent persons and lovers of the library have donated their personal book collections. There are 11 such collections and are housed separately as Special Collections.

The Central Library has a separate Jamia Authors Collection which houses 3,000 written books, edited and compiled by persons who are or were associated with Jamia Millia Islamia University. It has developed a centralized database of all the M.Phil. and Ph.D. theses awarded by the various departments of the University. It has also in its possession some valuable books in the Urdu language on Vedas, Mahabharata, Ramayana, Bhagavat Gita, Upanishads, Manuscripts on Swami Dayanand Saraswati, Guru Nanak and the Sikh religion, Sri Aurobindo, Swami Vivekanand, Radha Swami Movement, Bhagwan Mahavir and Gautam Buddha. Further, the library also has wealth of collection of 3,75,000 books, 60,000 Online Journals, 5,000 rare collection, 2,500 manuscripts, 1,800 Audio-Visual materials and Newspapers.

Membership: The Library provides membership to the teaching staff, research scholars, Undergraduate /Postgraduate students and administrative as well as non-teaching staff of this University. Research scholars and faculty members from other Universities are allowed to use the library facilities through reference only.

Library Services: The Central Library provides electronic access to more than 1,000 of e-journals through 15 major databases in different streams of Arts & Humanities, Social Sciences, Sciences, Law, Engineering and other related disciplines. The Central Library has also been functioning as a referral center on Urdu language & literature, Islamic Studies, and receives requests for its bibliographic information from all over the country.

Inter Library Loan Service supplements its stock by obtaining material from other libraries. It also has the membership of the American Center Library, British Library, DELNET and INFLIBNET to provide the services in the user community.

The Central Library has fully computerized its most actively used collection, which is searchable through OPAC on different terminals in the library. OPAC (On-line Public Access Catalogue) permits users to search documents by author, title, subject, keywords, Boolean search and call number. The Call Number indicates the location of the book on the shelf. For the smooth functioning of OPAC as well as Internet Search Services, a help desk has been setup to overcome the problems. The users are welcome to contact the person available on Help Desk in the library. The Library maintains a separate reference collection of fast finding that includes tools such as atlases, almanacs, biographical and language dictionaries, directories, statistical compilation and handbooks. It also has encyclopedias, technical data, maps and films.

The Library named as Dr. Zakir Husain Library has been inviting an academic program leading to the Bachelor's degree in Library and Information Science (BLIS) to fulfill the needs of the Library and Information Science profession. The program in Library and Information Science is an intensive in nature and thereby demands students who is highly dedicated to learning and motivated **(Dr. Zakir Husain Library, 2014)**.

3.4.14 Jawaharlal Nehru University

Jawaharlal Nehru University (JNU) was established in the early 1970s. It plays a vital role in higher education and research in the country. JNU opened its doors to faculty members and students, frontier disciplines and new possibilities on old disciplines were included in the University system in India. JNU has an excellent ratio such as 1:10 of students and teachers. It provides a mode of teaching, which encouraged learners (students and research scholars) to explore their own creativity instead of reproducing received information and a completely internal assessment were a new experiment on the Indian academic environment. In the founding of the University, the very Nehruvian objectives rooted such as; social justice, secularism, the democratic way of life, national integration, international understanding and scientific approach to the problems of society had built into it energetic and constant endeavor to renew knowledge by self-questioning.

The once rugged place of the Aravali hill range, where the 1,000 acre campus is housed is now lush green. The JNU campus is parts of it sustaining a birdwatcher's paradise, host dense forests and some forms of wild life. The campus is a microcosm of the Indian nation drawing students and scholars from diverse places of the country as

well as from every group and stratum of the Indian civilization. It organizes admission tests every year simultaneously at 37 centers spread across the length and breadth of the country. During the admission, special care is taken to draw students from underprivileged castes and ethnic groups by giving the reservation 22.5 percent of the total number of the students. It has a reservation of 10 percent as reserved seats for foreign students to take admission every year.

Blocks of faculty residences and hostels of students are scattered as per the vision of a large Indian family system. Even as class room teaching, work in laboratories and library have their share in the mode of teaching, individual communication between faculty members and among students form an tremendously important method of exchange of knowledge/views and lively medium of peer groups. Sometimes high decibel disputes about the validity of theoretical premises or cultural substructures of a particular economic or scientific thesis spill over from the class and hostel rooms onto the middle of the University roads due to traffic. Throughout the years of existence there has never been a road accident inside the campus! The University Annual Students Union elections are conducted entirely by the students.

In this campus several centers of the schools have been declared as ‘Centers of Excellence' by the University Grants Commission, New Delhi. These‘ Centers of Excellence’ include Centre for Historical Studies, Centre for the Study of Social Systems, Centre for Political Studies, Centre for the Study of Regional Development, Centre for Economic Studies and Planning and the School of Social Sciences. Some of the other schools are 3 Science Schools, School of Environmental Sciences, School of Physical

Sciences and School of Life Sciences which have also received the Centers for Excellence Recognition by UGC **(Jawaharlal Nehru University, n.d.)**.

3.4.14.1 About the Library: Jawaharlal Nehru University

The Central Library is also known as the knowledge hub of Jawaharlal Nehru University which provides comprehensive access to books, periodicals (journals & magazines) theses and dissertations, reports, surveys covering various disciplines.

The Central Library of JNU is located at the heart of the Academic Complex. The Library has a carpet area near about one lakh square feet. The JNU Central Library is shifted in a nine-storied building. The first floor of the Central Library consists of Social Science Section-I and Photocopying facility, second floor has the Social Science Section-II, third floor comprises the Computer and Natural Science Collection, fourth floor contains the European Language Collection & Australian Collection, fifth floor houses the Afro-Asian Language Collection and Indian Language Collection, sixth floor contains P.C. Joshi Archives on Contemporary History Textbooks Collection, seventh floor has the Arts and Rare books Collection, Library Science Collection, On-line Newspapers & Theses/Dissertation, eighth floor consists of the Russian Collection whereas the ninth floor has the ETD Lab., Govt. Data Centre and e-Learning Centre United Nation and other International organizations publications. It is established in the middle of the academic complex that can easily be accessible from all the Schools and Centres of the University. The Central Library Reading Room opens 24 hours and timing of the charging/ discharging of information sources from 09 A.M. to 08 P.M. every day of the week on 361 days during a year. The Central Library of the University observes only four

holydays in the year such as Independence Day, Republic Day, Gandhi Jayanti and Holi festivals. The University Library has been developed with two objectives: to support the academic programs of the University and to support the research pursuits of the teaching community and the research scholars of Jawaharlal Nehru University Library

The Central Library has collection over 5,50,000 books, over 10,000 audio-visual items, and journals in print format offering online access to more than 20,000. The library collection is equipped with subject-wise under three major streams, such as, Social Sciences, Humanities and Natural Sciences. It incorporates the library of prestigious Indian School of International Studies established in 1969. This was merged with Jawaharlal Nehru University. The JNU library is playing role as a depository of all Government publications and publications of some very important International agencies like UNESCO and World Health Organization. It also has referral collection of EC Documents.

The Library of the campus is fully computerized and automated for all its operations. It is using Vertua for library automation and D-space software for digitization and content management. The library provides search facilities for databases of books, periodicals and other materials, like Articles Databases of Social Science Periodicals subscribed On-line Public Access Catalogue (OPAC) since 1990 **(Annual Report, JNU New Delhi, 2012-13)**.

The Library is planning to make an institutional repository in very near future. It also has planned for implementation of RFID technology and is further planning to install CCTV cameras inside the library.

3.4.15 South Asian University (SAU)

The South Asian University (SAU) was established by the eight member nations of South Asian Association for Regional Co-operation (SAARC) namely; Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. It comes under the category of an International University. The Prime Minister of India mooted in 2005 at the 13th SAARC Summit in Dhaka to establish this library. The idea was for member nations to pool information and knowledge resources for making of a Centre of Excellence in the form of higher education (University) that would deliver world-class facilities and professional faculty to students and research scholars drawn from every country of the SAARC region. An agreement was reached amongst all SAARC Member States and an inter-ministerial committee to establish the University and signed in the 14th SAARC Summit which was held in New Delhi, India in the month of April 2007.

The Government of India established a Project Office of the SAU in 2008, of which Prof. G.K. Chadha, a former Vice Chancellor of the Jawaharlal Nehru University, New Delhi, was appointed as the Chief Executive Officer. The Project Office of South Asian University was wound up and the University unlocked its door to students in August 2010. It offers doctoral and Post Graduate courses in seven areas: Applied Mathematics, Computer Science, Biotechnology, Development Economics, International Relations, Law and Sociology. It will ultimately have 12 faculties including Post Graduate sciences and other than conservative sciences. Further, with the full strength, the University will have 7,000 students in different disciplines and 700 teaching staff. In

near future, it has also planned to open a flagship Institute of South Asian Studies in the University Campus.

In the year 2008 on 26 May, Pranab Mukherjee, then Indian External Affairs Minister, laid the foundation stone of the University Campus at a 100-acre plot in Maidan Garhi, Mehrauli in South Delhi. The campus construction is due to start in 2014. The cost of establishing the SAU is being funded by the Government of India. The whole costs of the project will be shared by all SAARC member countries that have mutually agreed upon it. The University would also raise funds from international financial institutions, educational foundations, organizations and donors.

In order to start educational activities, a temporary campus of the University was initially set up in few buildings provided by the Jawaharlal Nehru University, Delhi. In the year 2011, the campus was subsequently relocated to Akbar Bhawan, Chanakyapuri in South Delhi. By the year 2016-17, the University expects to shift to its own residential campus for smooth functioning of its operations.

The first academic session of South Asian University was started in 2010. Since the time of its inception, the University started Post Graduate (PG) and Research (Ph.D.) programs in various disciplines that included Computer Sciences, Mathematics, Bio-technology, Development Economics, Sociology, Law and International Relations. In the near future, the University will ultimately commence 11 Post Graduate faculties and a faculty of Under Graduate studies. Due to Specialized Courses and International Level of study, it attracts students to take admission from all member countries and the degree which is provided to the students is recognized by all the eight SAARC countries.

At present, the University is functioning at Akbar Bhawan Campus in Chanakyapuri, New Delhi and would eventually moves into a 100 acre allotted real campus in Maidan Garhi, South Delhi, where the construction is expected to commence very soon **(South Asian University n.d.)**.

3.4.15.1 Central Library: South Asian University

South Asian University Library (SAU Library) was established to fulfill the academic and research needs of the students, faculty members and other personnel of the library. The Library has more than 8,000 volumes of books published by various popular publishers. The SAU Library subscribes to five magazines: Himal, Economic and Political weekly, Book Review, Outlook, Frontline, Newsweek, India Today and six daily newspapers: Hindustan times, The Times of India, The Hindu, The Economic, The Asian Age and The Indian Express.

The Library remains open from 09:15 A.M. to 5:15 P.M. from Monday to Friday for circulation and lending services while the reading room opens for 24 hours. Students can borrow a maximum of three books at a time for one week and general reference books for two weeks. Teachers can also check out library resources for one complete semester.

SAU Library has implemented the Integrated Library System using an Open Sources KOHA. Library Circulation services are provided by using a barcode system. OPAC is also available for searching various library resources. Automatic email confirmation is also being sent to the library members for their circulation records, reminders et.al. In general, the teaching staff of the University can access most of the

online resources from off-line campus. The library has a Cyber Center to access subscribed online resources by the patrons. There are 15 workstations available in this center. The Library has a separate reference section, which has different print volumes of reference books, print periodicals, journals, newspapers and magazines. At a time 20 users are able to seat themselves for reading. Recently, the library has shifted to its new space which is around 4500 sq. ft. Various sections and services like Reference Library, Audio Visual Library, Digital Library, Institutional Repository, Cyber Centre and Open Reading Hall is expected to be started very soon **(South Asian University n.d.)**. The Library will implement RFID technology for the management of valuable library resources. It will also start organizing seminars, workshops and information literacy courses for the students and research scholars to become aware about their library services, use of library and use of open resources. It will start services like CAS and SDI. The Library will try to form a Consortium/Association for South Asian Libraries.

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Chapter- 4

Data Analysis and Interpretation

Chapter- 4

Data Analysis and Interpretation

This chapter discusses in detail about the analysis and interpretation of data collected through a survey conducted among the 15 Central University Libraries of North India.

4.1 Introduction

The application and uses of Library automation and Content Management Software is one of the most significant tasks for any type of library, particularly in theh higher education system in the present information era. The adaption of ICT applications have been providing improved services and facilitating stress-free and remote access to the users of various libraries and information resources within a reasonable amount of time. The present study has been undertaken mainly to ascertain the use and implementation of library software packages and applications that are being used for automation and digitization processes in the Central University Libraries of North India.

The analysis of data and interpretation is one of the most important aspects of any research study for assessing and evaluating the collected qualitative and quantitative data to make a logical sense through the utilization of analytical enlightenment and logical reasoning to examine each aspect of the research results. The analysis of data and interpretation is largely based on the responses received from the librarians as per the distribution of a structured questionnaire. This helps in

exploring the objectives of the study as well as to prove the hypotheses, which are initially assumed by the investigator.

The present study covers fifteen Central University Libraries of North India and deals with the valuation of different types of software used for automation and digitization processes on the basis of the feedbacks received from the Librarians. The growth and development of Central Universities can be traced state-wise, such as, the state of Uttar Pradesh includes 4 Central Universities, Delhi State includes 5 Central Universities and 6 newly established Central University as per University Act, 2009.

4.2 Analysis and Interpretation of Data

The collected data were analysed and interpreted in the tables, figures and graphs and for assessment of the stated hypothesis. The present study has employed Chi-Square test to prove the hypothesis. Chi-Square is a non-parametric test of statistical significance for bi-variate tabular analysis. It is one of the most frequently used method of testing the statistical significance of findings reported in the study.

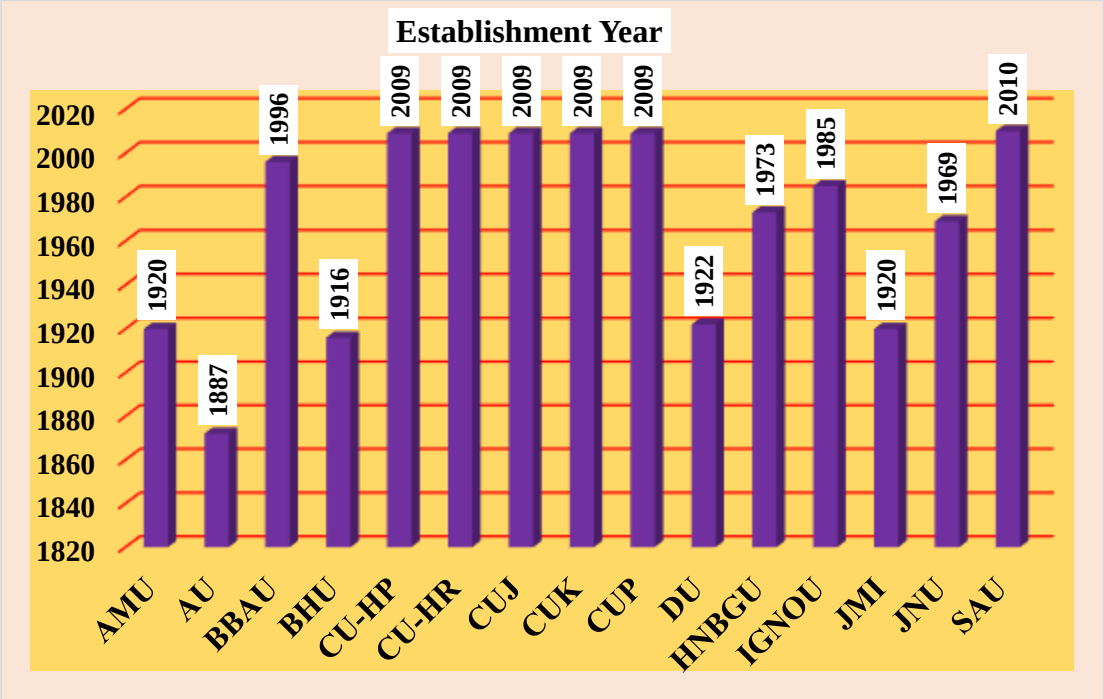
Formula of the chi-square $\chi^2 = \sum \frac{(O-E)^2}{E}$

The Data Analysis and Statistical Software (STATA) and Microsoft-Excel Application have been used to feed and tabulate the data to find the results.

Table: 4.2.1: Establishment of Central Universities in North India

S. No.	Name of University	Year	Place
1.	Aligarh Muslim University (AMU)	1920	Uttar Pradesh
2.	Allahabad University (AU)	1887	Uttar Pradesh
3.	Babasaheb Bhimrao Ambedkar University (BBAU)	1996	Uttar Pradesh
4.	Banaras Hindu University (BHU)	1916	Uttar Pradesh
5.	Central University of Himachal Pradesh (CU-HP)	2009	Himachal Pradesh
6.	Central University of Haryana (CU-HR)	2009	Haryana
7.	Central University of Jammu (CUJ)	2009	Jammu & Kashmir
8.	Central University of Kashmir (CUK)	2009	Jammu & Kashmir
9.	Central University of Punjab (CUP)	2009	Punjab
10.	University of Delhi (DU)	1922	Delhi
11.	Hemwati Nandan Bahuguna Garhwal University (HNBGU)	1973	Uttarakhand
12.	Indira Gandhi National Open University (IGNOU)	1985	Delhi
13.	Jamia Millia Islamia (JMI)	1920	Delhi
14.	Jawaharlal Nehru University (JNU)	1969	Delhi
15.	South Asian University (SAU)	2010	Delhi

Figure: 4.2.1: Establishment of Central Universities in North India



The above Table 4.2.1 and Figure 4.2.1 displays the establishment year of Central Universities of North India. It is observed that among the Universities; Allahabad University (AU) is the oldest; which was established in 1887 and South Asian University (SAU) is the latest and was established in 2010.

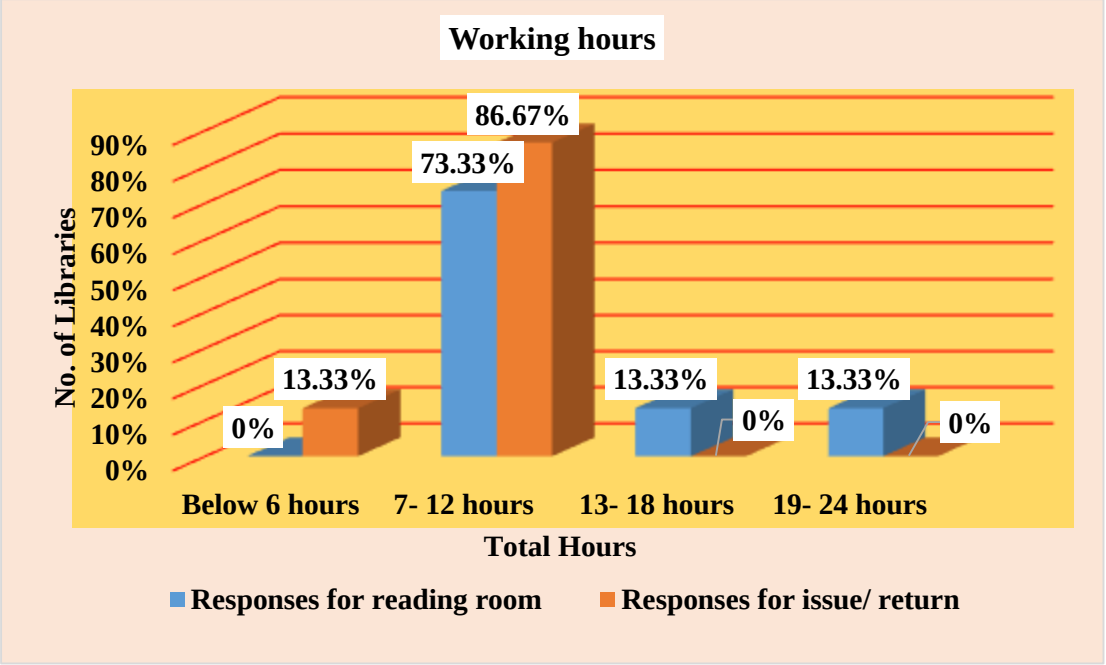
The table also indicates that in the pre-independence era 5 (33.33%) Universities were established, namely Aligarh Muslim University (AMU) in the year 1920, Allahabad University (AU) in 1887, Banaras Hindu University (BHU) in the year 1916, University of Delhi (DU) in 1922 and Jamia Millia Islamia (JMI) in 1920 respectively. In the post-independence era till the year 2014, 11 University Libraries have been established out of them 6 Universities were established during the year 2009 to 2014. It is abundantly clear that in the period of 1947 to 2008, only 4 (26.67%) Central Universities have been established, whereas a majority of 6 (40%) Central Universities established in the period of 2009 to 2014, which indicate the

dawdling growth for establishing a new University by the Government in North India during the period of 1947 to 2008.

Table: 4.2.2: Libraries Working Hours

S. No.	Timing	Responses for reading room	Responses for issue/ return
1.	Below 6 hours	0 (0%)	2 (13.33%)
2.	7- 12 hours	11 (73.33%)	13 (86.67%)
3.	13- 18 hours	2 (13.33%)	0 (0%)
4.	19- 24 hours	2 (13.33%)	0 (0%)

Figure: 4.2.2: Libraries Working Hours



The respondents were asked about the timing of Reading room and Circulation Section to find out the variation in the opening hours among the University Libraries. The Table 4.2.2 and Figure 4.2.2 illustrates that the timing of the reading room as well as the issue/return among Central University Libraries under study. It is observed that as regards the reading room facility, a majority of the libraries 11 (73.33%) are opening for 7 to 12 hours in a day, 2 (13.33%) libraries opened in 13 to

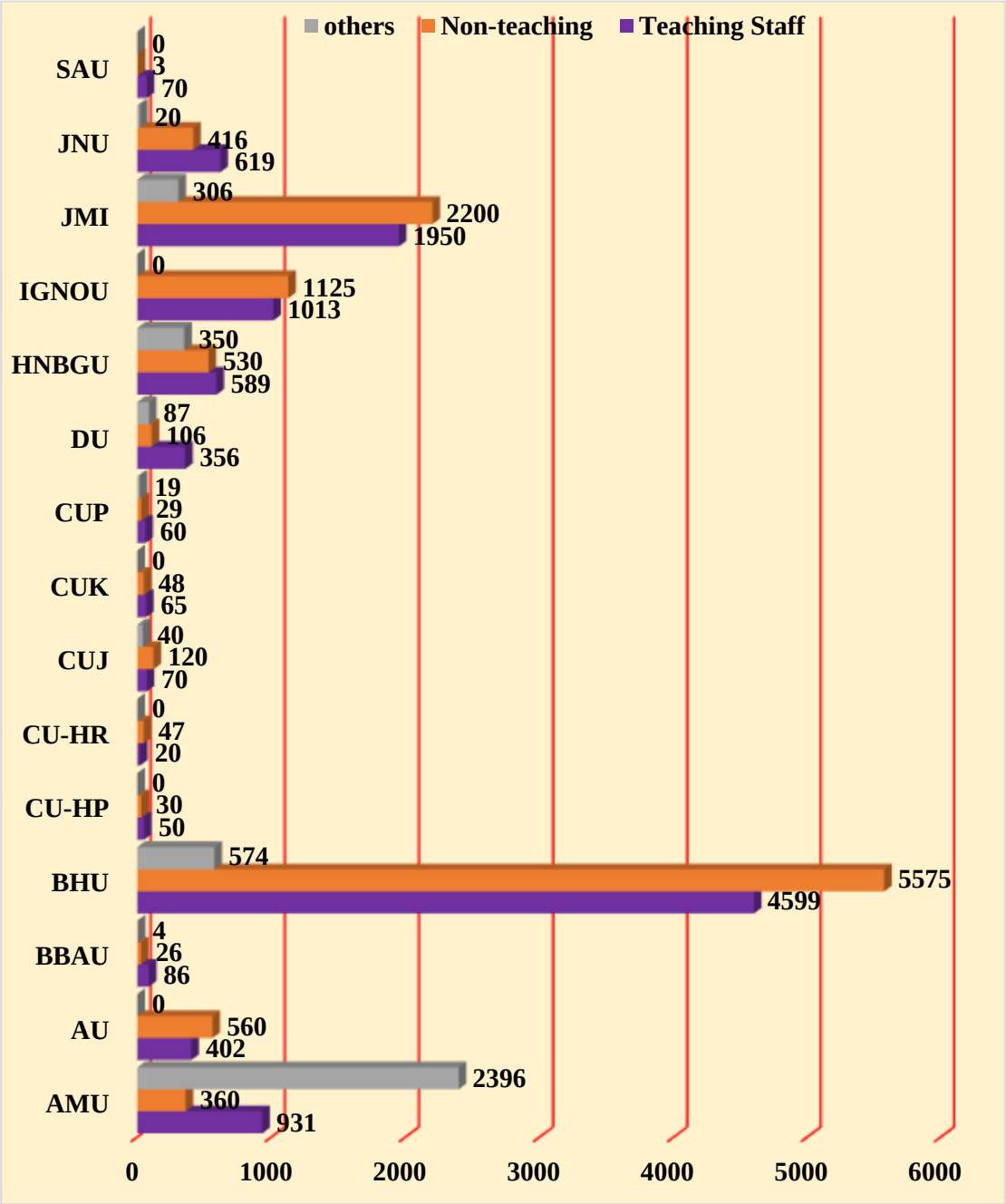
18 hours and 2 (13.33%) of libraries have also been opened in 19 to 24 hours. The results of the study indicate that most of the University Libraries keep their reading rooms open for providing the facility to the users.

On the other hand, the result also established the fact that as regards the Circulation Section or Issue /Return of books, a majority of 13 (86.67%) of the libraries open their Circulation Section between 7 to 12 hours and 2 (13.33%) libraries open for below 6 hours. The results clearly indicate that these University Libraries do not open their Circulation Section for more than 12 hours in a day.

Table: 4.2.3: Users Category in Central University Libraries

S. No.	Name of University	Teaching Staff	Research Scholars	PG Students	UG Students	Non-teaching	others	Total
1.	AMU	931	1600	2800	6600	360	2396	**14687**
2.	AU	402	1505	6000	14000	560	0	**22467**
3.	BBAU	86	250	1415	102	26	04	**1883**
4.	BHU	4599	1662	12550	4500	5575	574	**29460**
5.	CU-HP	50	78	237	0	30	0	**395**
6.	CU-HR	20	30	300	0	47	0	**397**
7.	CUJ	70	50	480	0	120	40	**760**
8.	CUK	65	10	479	48	48	0	**650**
9.	CUP	60	120	399	0	29	19	**627**
10.	DU	356	1088	2101	0	106	87	**3738**
11.	HNBGU	589	202	3800	4273	530	350	**9744**
12.	IGNOU	1013	89	256	257	1125	0	**2740**
13.	JMI	1950	2000	3300	4625	2200	306	**14381**
14.	JNU	619	2501	1320	387	416	20	**5263**
15.	SAU	70	50	400	0	3	0	**523**
Total		**10880**	**11235**	**35837**	**34792**	**11175**	**3796**	**107715**

Figure: 4.2.3.1: Users Category (Teaching Staff, Non-teaching and Others) in Central University Libraries

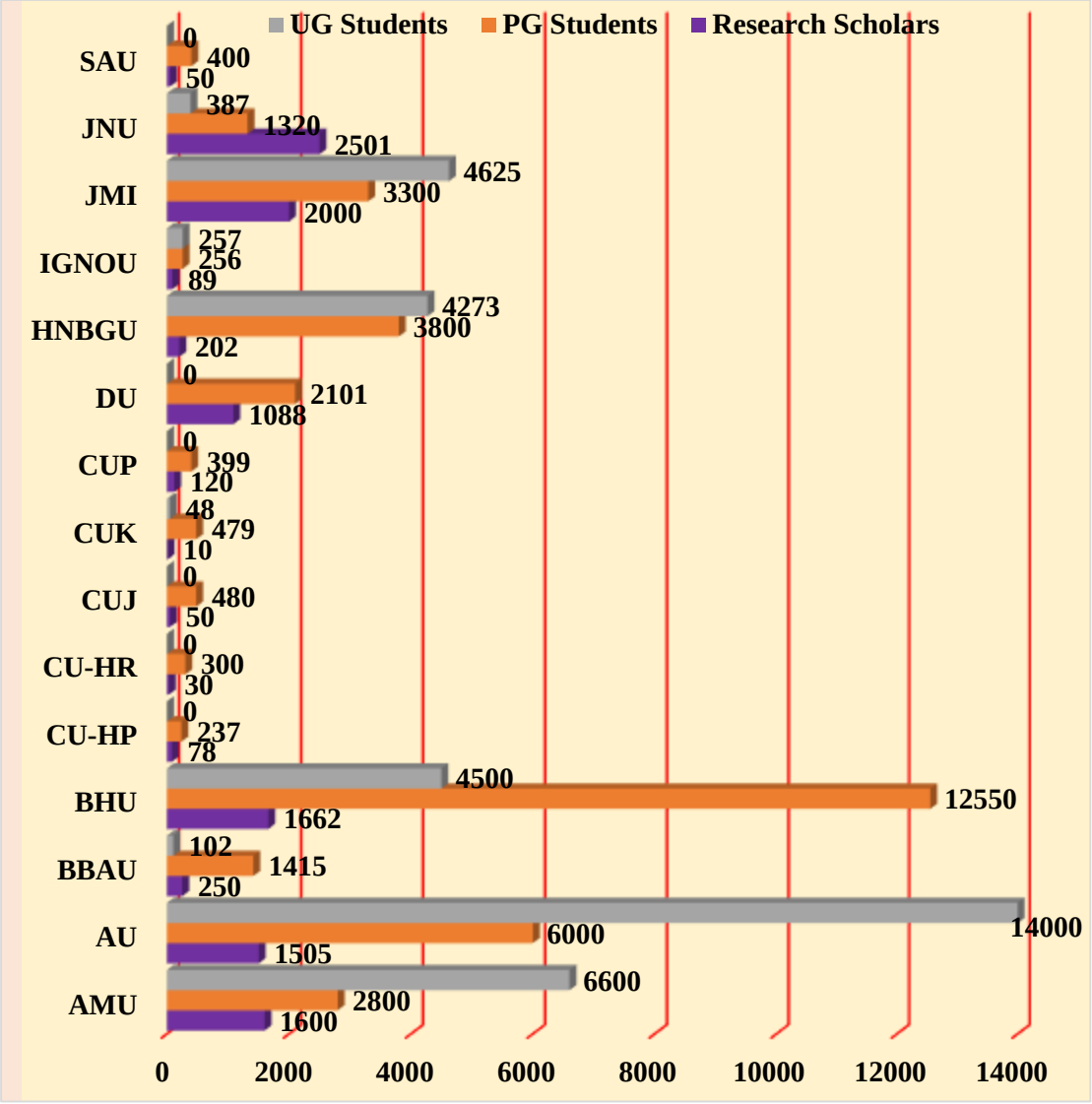


The Table 4.2.3 including Figure 4.2.3.1 and 4.2.3.2 highlights the increase in the number of library users of various categories, such as, Teaching Staff, Research Scholars, Post Graduate Students, Under Graduate Students, Non-teaching and others in the academic year 2013-14. The table also represents that around 60% Universities

are offering Under Graduate, Post Graduate and Research Programs and the remaining 40% of them do not offer Under Graduate Courses.

The result indicates that the BHU Library provides services to a maximum number of users (10,748) including Faculty, Non-teaching and other members followed by JMI 4,456 users, AMU 3,687 users, IGNOU 2,138 users, JNU 1,055 users AU 962 users, DU 549 users, CUJ 230 users, BBAU 116 users, CUK 113 users, CU-HP 80 users, SAU 73 users and CU-HR 67 users.

Figure: 4.2.3.2: Users Category (Research Scholars, PG Students and UG Students) in Central University Libraries

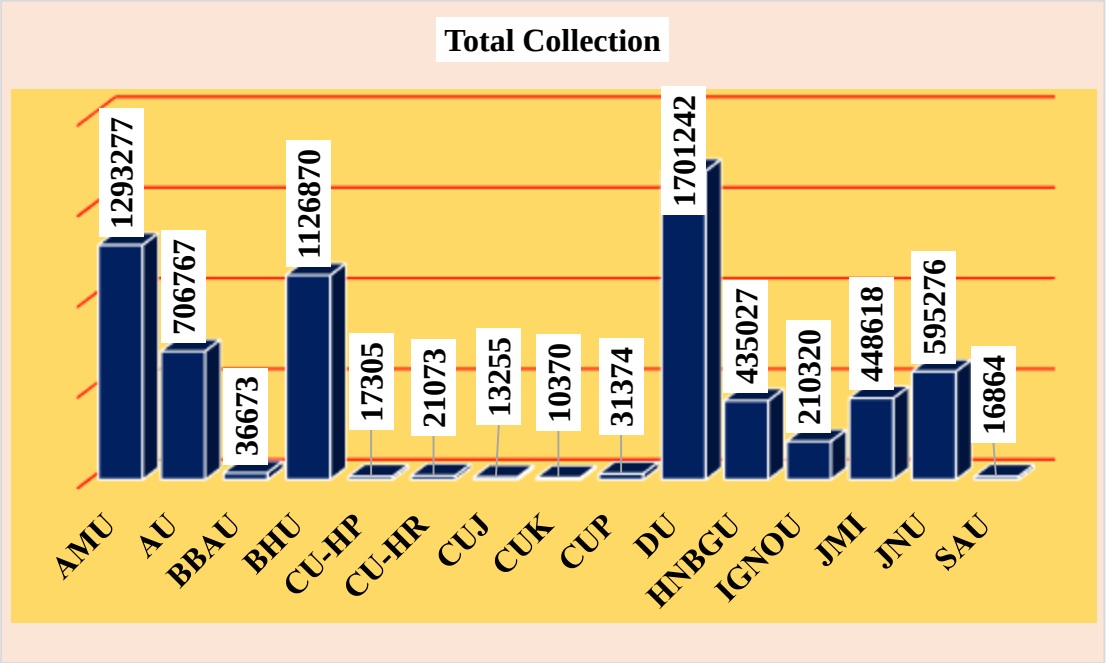


The result indicate that BHU Library provides services to maximum number of users (18,712) including Research Scholar, Post Graduate Students and Under Graduate Students followed by AU 21,505 users, AMU 11,000 users, JMI 9,925 users, JNU 4,208, DU 3,189 users, BBAU 1,767 users, PG and UG students followed by IGNOU 602 users, CUJ 530 users, CUK 537 users, SAU 450 users, CU-HR 330 users CU-HP 315 users.

Table: 4.2.4: Collection of Central University Libraries

S. No.	Name of University	Books	Online Journals	Print Journals	Rare collection	Theses/ Dissertations	Manuscripts	Audio-Visual materials	Newspapers	Total collection
1.	AMU	1239000	7680	694	10000	12241	15162	1500	7000	**1293277**
2.	AU	678024	11036	425	0	16375	0	890	17	**706767**
3.	BBAU	31000	5000	0	0	158	0	500	15	**36673**
4.	BHU	1095181	10484	560	0	12812	7233	600	0	**1126870**
5.	CU-HP	12082	5000	70	0	44	0	100	09	**17305**
6.	CU-HR	13400	7428	145	0	55	0	30	15	**21073**
7.	CUJ	8765	3000	10	800	459	0	210	11	**13255**
8.	CUK	8000	2000	20	0	121	0	215	14	**10370**
9.	CUP	21423	9572	95	0	107	0	156	21	**31374**
10.	DU	1600000	80000	425	2200	16000	1000	1600	17	**1701242**
11.	HNBGU	427205	0	0	0	5782	0	2000	40	**435027**
12.	IGNOU	129582	75000	490	0	100	0	5120	28	**210320**
13.	JMI	375000	60000	1100	5000	3200	2500	1800	18	**448618**
14.	JNU	550000	20000	723	1500	21000	0	2000	53	**595276**
15.	SAU	9500	7180	8	0	0	0	170	06	**16864**

Figure: 4.2.4: Collection of Central University Libraries



The respondents were also asked to indicate the total collection of various resources available in the libraries in order to know the total collections available in the University Libraries. The above Table 4.2.4 and Figure 4.2.4 depicts the collection of books as well as other information sources available in Central University Libraries of North India. The result indicates that Delhi University Library has the highest collection, which includes more than 17,01,242 volumes of resources, AMU Library has more than 12,39,277 volumes of resources and BHU Library has more than 11,26,870 volumes of resources respectively. Further, it was also found that some of the oldest University Libraries such as AU, DU and JNU have a rich collection for their users; whereas, other recently established libraries under the Central University Act- 2009 have an inadequate collection of resources for their users such as CUK Library, which has the least collection of resources, although these University Libraries have been steadily increasing their library collections. Therefore, the there

is an emergent need for an appropriate Collection Development Policy required in these University Libraries for rapidly increasing their collection of resources.

The results also found that a wider variation in the collection of printed and online journals among the University Libraries. With regard to the online journals, it is observed that the majority of University Libraries have an excellent an excellent collection of online journals, yet surprisingly HNBGU Library does not subscribe for online journals. Today online journals have been emerging as one of the key resources and used extensively in the University Libraries for conducting the research work in varied subject areas. However, when the researcher compares online journals with regard to printed journals, it is also evident that there are enormous variances in the collation of journals among the University Libraries. Most of the oldest University Libraries have been subscribing to a large collection of printed journals, in comparison of newly established libraries due to the emergence of online journal publications. It is surprising that BBAU Library and HNBGU Library are not subscribing for printed journals. It emerged that a majority of the University Libraries do not cover all types of resources, only a few libraries, such as, AMU and DU having the collection of all varieties of resources which are covered under study.

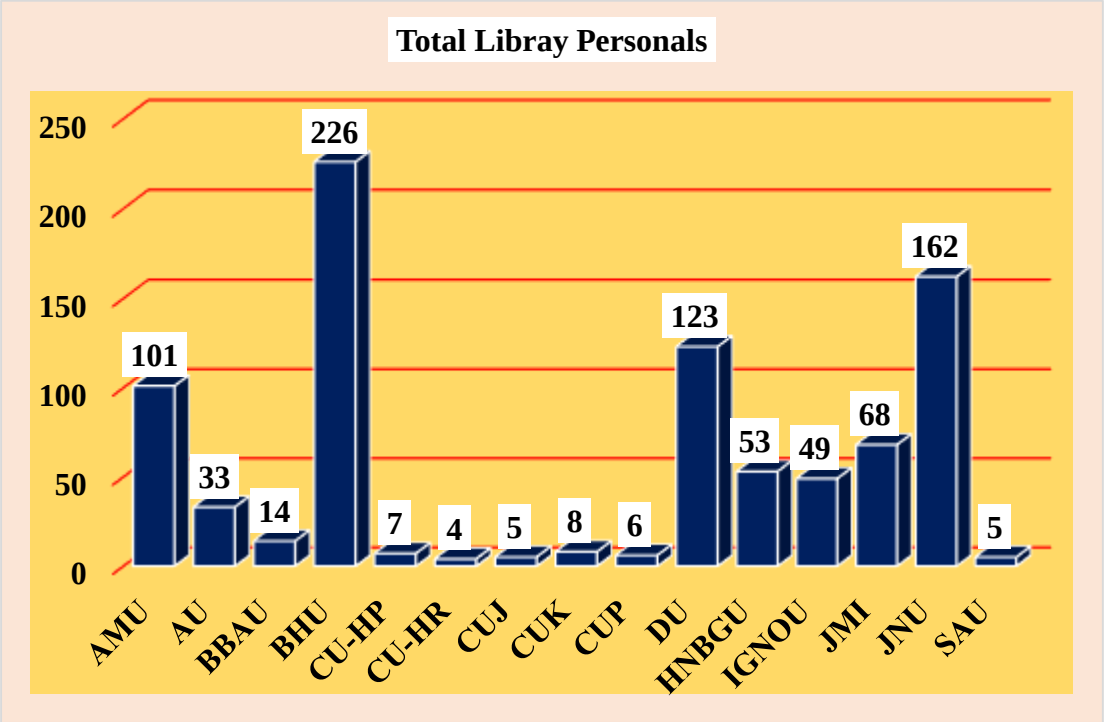
Table: 4.2.5: Strengths of Library Personnel

S. No.	Name of University	University Librarian/ In-charge	Deputy Librarian	Assistant Librarians	Professional Assistants	Semi-Professional Assistants	Library Assistants	Others	Total
1.	AMU	01	01	05	17	44	-	33	**101**
2.	AU	01	01	-	01	-	-	30	**33**
3.	BBAU	01*	-	01	01	01	01	09	**14**
4.	BHU	01	07	13	35	70	40	60	**226**
5.	CU-HP	01*	-	-	-	01	01	04	**7**
6.	CU-HR	-	-	01	-	-	-	03	**4**
7.	CUJ	01*	-	03	-	-	-	01	**5**
8.	CUK	01	-	01	02	-	-	04	**8**
9.	CUP	01*	-	-	01	-	-	04	**6**
10.	DU	01	05	04	38	37	-	38	**123**
11.	HNBGU	01	-	01	-	01	-	50	**53**
12.	IGNOU	01	02	-	04	09	-	33	**49**
13.	JMI	01	01	04	14	10	-	38	**68**
14.	JNU	01	03	13	29	28	-	88	**162**
15.	SAU	-	-	01	01	-	02	01	**5**

Note: '*' indicates as In-charge Librarian

'-' indicates as Vacant Position

Figure: 4.2.5: Strengths of Library Personnel



The respondents were questioned about the existing strengths of human resources in their libraries to explore the maximum number of library professionals and the present status of staff in the University Libraries. The data indicated in the Table 4.2.5 and Figure 4.2.5 has been summarised into three parts, Central University of Uttar Pradesh, Central University of Delhi region and newly established Central Universities.

The results indicate that in Utter Pradesh region there were maximum (226) library professionals working in the BHU Library, followed by AMU 101 library professionals. Further, the table indicates that 33 professionals are working at AU Library and 14 library professional at BBAU. In addition, it was observed that the maximum numbers of non-library professional staff are working in these libraries.

In the Delhi region, it was found that a maximum (162) library professionals are working in JNU, followed by DU 123 library professionals, JMI 68 library

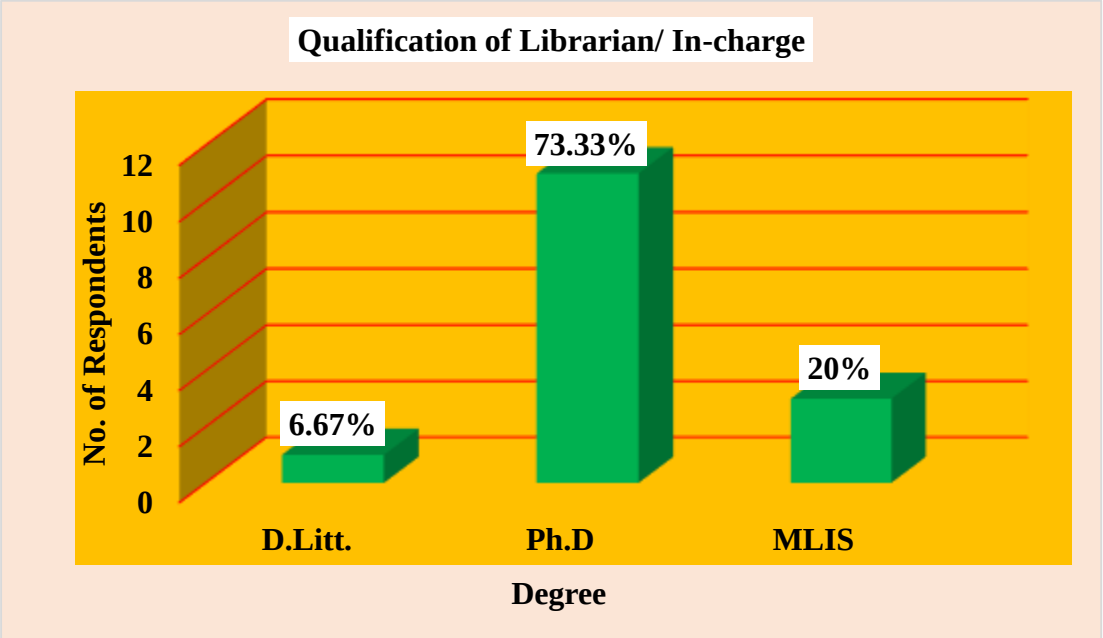
professionals and IGNOU 49 library professionals. It is also observed that 09 University Libraries have permanent Librarians, 04 University Libraries are working with In-charge Librarian and 02 of them have no Librarians. It is also observed that around 50% of the University Libraries are working without Deputy Librarians. Furthermore, it was found that some of the libraries (AMU, BHU, DU, JNU and IGNOU) have a good strength of other library staff, particularly PA and SPA. In SAU, it is found that only 5 library professionals are working without University Librarian (UL) and Deputy Librarian (DL).

Among the newly established Universities, it is found that maximum (53) library professional are working in HNBGU, CUK 8 library professionals, CU-HP 7 library professionals, CUP 6 library professionals, CUJ 5 library professionals and CU-HR 4 library professionals are working respectively. It is absolutely clear that the maximum number of the library professionals are working in the HNBGU library, due to its conversion as a Central University, whereas other recently established Central Universities require more library professionals in their libraries for functioning smoothly.

Table: 4.2.6: Qualification of Librarians

S. No.	Qualification	No. of Respondents	Percentage
1.	D.Litt.	1	6.67%
2.	Ph.D.	11	73.33%
3.	MLIS	3	20%
Total		**15**	**100**

Figure: 4.2.6: Qualification of Librarians

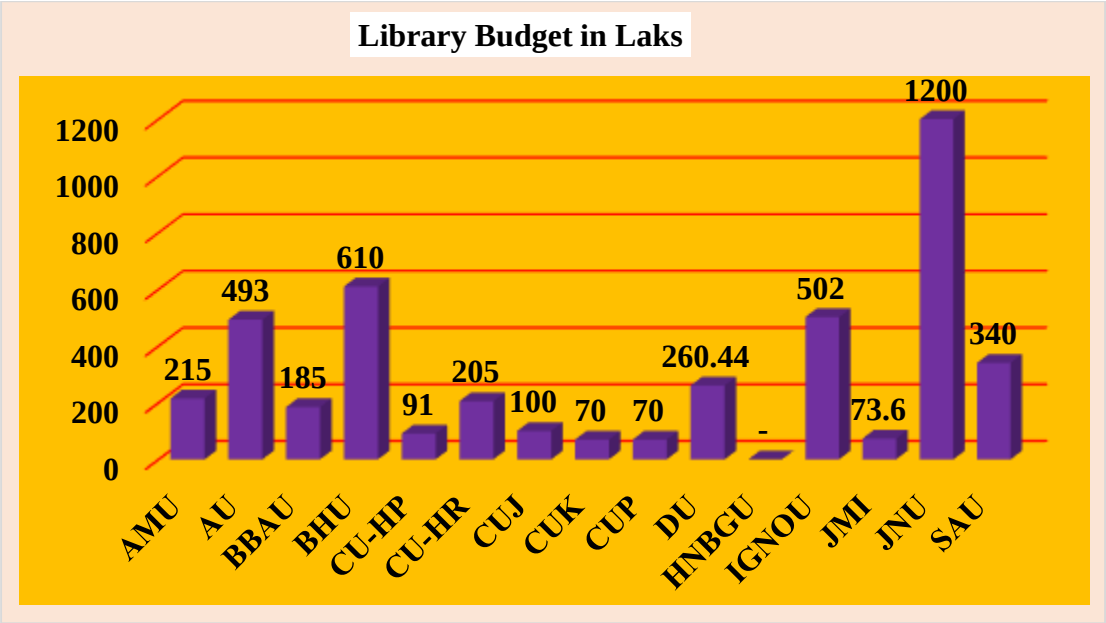


The respondents were asked about the qualifications of Librarians to assess their technical or professional expertise in managing of ICT based library resources. The Table 4.2.6 and Figure 4.2.6 describe the details of qualifications of the Librarians among University Libraries. The result indicates that a majority of 11 (73.33%) Librarians possess Ph.D. qualifications, 3 (20%) of the Librarians have Masters' Degree in Library and Information Science and just 1 (6.67%) Librarian has D. Litt. Qualification. Therefore, the analysis of the table also indicates that the inconsistency of the qualification in the selection of Librarians/In-charge in these University Libraries.

Table: 4.2.7: Library Budget for the Year 2013- 2014 (Rs. in Lakhs)

S. No.	Name of University	Books	Periodicals	Information Technology	Others	Total
1.	AMU	40.00	160.00	15.00	-	**215.00**
2.	AU	150.00	343.00	-	-	**493.00**
3.	BBAU	164.00	21.00	-	-	**185.00**
4.	BHU	610.00				**610.00**
5.	CU-HP	50.00	20.00	11.00	10.00	**91.00**
6.	CU-HR	205.00		-	-	**205.00**
7.	CUJ	50.00	50.00	-	-	**100.00**
8.	CUK	50.00	20.00	-	-	**70.00**
9.	CUP	50.00	20.00	-	-	**70.00**
10.	DU	82.35		177.76	.33	**260.44**
11.	HNBGU	-	-	-	-	**-**
12.	IGNOU	200.00	300.00	2.00	-	**502.00**
13.	JMI	10.00	51.85	11.75	-	**73.60**
14.	JNU	300.00	700.00	200.00	-	**1200.00**
15.	SAU	40.00	300.00	-	-	**340.00**

Figure: 4.2.7: Library Budget for the Year 2013- 2014



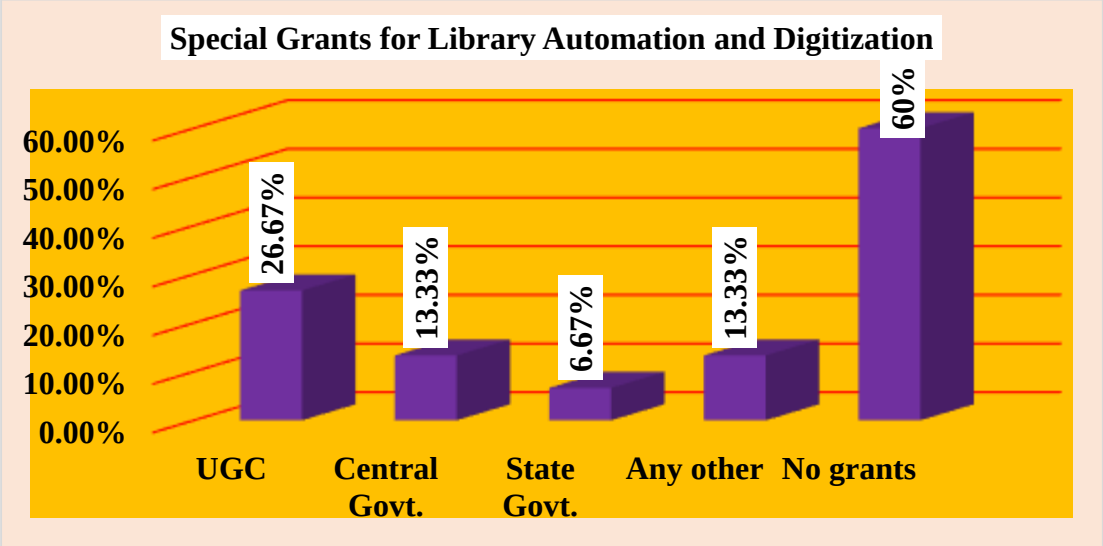
The respondents were asked to mention their budget allocation in one financial year to know about the expenditure on the different types of library resources, which includes books, periodicals, information technology and other resources. Table 4.2.7 and Figure 4.2.7 indicate that JNU library avails the highest budget Rs. 1200 Lakh followed by BHU Library avail Rs. 610 Lakh, IGNOU Rs. 502 lakh, AU Library Rs. 493 Lakh, SAU library Rs. 340 Lakh, DU Rs. 260 Lakh, AMU Rs. 215 Lakh, BBAU Rs. 185 Lakh, CU-HR Rs. 205 Lakh, CUJ Rs. 100 Lakh, CUHP Rs. 91 Lakh, JMI Rs. 73.60 Lakh, CUK and CUP Rs.70 Lakh respectively.

It has been noticed that a majority of 5 (33.33%) University Libraries are allocated a budget of less than Rs. 1.00 crore, followed by 4 (26.67%) libraries that are allocated a budget between Rs. 2.00 to Rs. 3.00 crore, 2 (13.33%) libraries are allocated a budget between Rs. 4.00 to Rs. 5.00 crores, only 2 (13.33%) libraries are allocated a budget between Rs. 6.00 to Rs. 7.00 crores. It was also observed that no library is allocated a budget in the range of between Rs. 8.00 to Rs. 9.00 and Rs. 10.00 to Rs. 11.00 crore whereas, the Jawaharlal Nehru University (JNU) library is allocated a maximum budget in the range of Rs. 12.00 to Rs. 13.00 crore for purchasing various types of library information resources. Further, it is clear that the highest budget allocated in the range of Rs. 12.00 to Rs. 13.00 crore rupees and below Rs. 1.00 crore observed as the minimum range of budget allocated to the most of the libraries. The HNBGU library does not provide the financial data or detail about the expenditure of library resources.

Table: 4.2.8: Special Grants for Library Automation and Digitization

S. No.	Granting Agency	No. of Mix Res. N= 15	Percentage
1.	UGC	4	26.67%
2.	Central Government	2	13.33%
3.	State Government	1	6.67%
4.	Any other	2	13.33%
5.	No grants	9	60%

Figure: 4.2.8: Special Grants for Library Automation and Digitization



In the present of the burgeoning ICT era, automation of libraries is an essential requirement for providing quality services to satisfy their users. There is a urgent need for special grants to computerization/ automation and digitization in libraries, particularly of University Libraries in India. The libraries have been using computer technology in particular, to automate in the fundamental areas of library operations, such as, Circulation System, Cataloguing, Acquisitions, Reference services, Serial control and OPAC services.

In order to determine the evaluation of automation and digitization initiatives, the respondents were asked to mention about the special grants provided for the

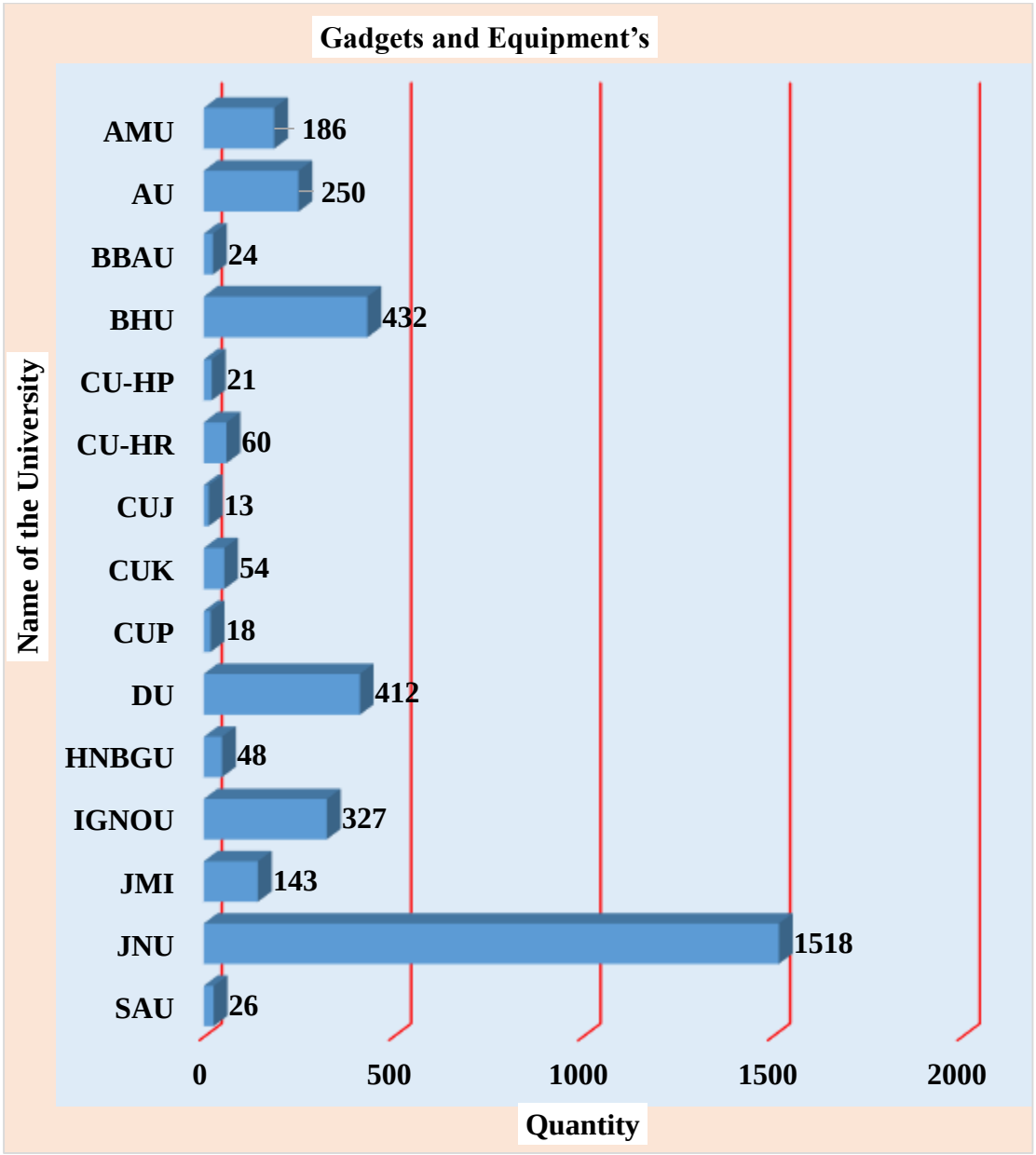
development of library automation and digitization process. The Table 4.2.8 and Figure 4.2.8 reveals that only 6 (40%) University Libraries of North India are receiving special grants, particularly for the automation and digitization of library activities; whereas, a majority of 9 (60%) University Libraries are not receiving any special grants. The table also displays that a majority of 4 (26.67%) University Libraries are receiving a special grant from the UGC, 2 (13.33%) University Libraries are receiving from the Central Government along with 2 (13.33%) Universities that also funded by other sources and just 1 (6.67%) University Library received their grant from the State Government respectively. Furthermore, it is noted that only two Universities (DU and JNU) are receiving special grants from the two sources such as UGC and some other sources among the University Libraries.

Table: 4.2.9: Availability of Electronic Gadgets and Equipment in Libraries

S. No.	Name of University	Computer	Server	Photocopy machine	Scanner	Barcode reader	Barcode Printer	Laser Printer	Digital camera	Laptop	Projector	UPS	CD/DVD writer	Total
1.	AMU	116	03	03	05	08	01	04	01	02	01	35	7	**186**
2.	AU	80	01	03	01	-	-	03	-	01	01	80	80	**250**
3.	BBAU	10	-	02	02	-	-	02	-	-	01	06	02	**25**
4.	BHU	304	04	03	06	09	05	33	01	03	01	61	02	**432**
5.	CU-HP	07	01	-	-	-	01	04	-	-	-	01	07	**21**
6.	CU-HR	27	-	02	01	-	-	02	-	-	-	01	27	**60**
7.	CUJ	10	01	01	01	-	-	-	-	-	-	0	0	**13**
8.	CUK	17	-	01	01	-	-	-	-	01	-	17	17	**54**
9.	CUP	07	01	01	01	-	-	-	-	-	01	07	0	**18**
10.	DU	150	04	01	12	05	05	20	-	03	02	60	150	**412**

11.	HNBGU	21	-	01	01	-	-	02	-	01	-	21	01	**48**
12.	IGNOU	100	02	01	02	02	01	24	40	-	01	54	100	**327**
13.	JMI	120	02	01	01	05	05	03	-	01	01	03	01	**143**
14.	JNU	450	04	03	40	05	04	30	01	80	01	450	450	**1518**
15.	SAU	04	-	01	-	01	01	01	-	-	-	18	0	**26**

Figure: 4.2.9: Availability of Electronic Gadgets and Equipment in Libraries



Library Automation and Content Management processes require adequate infrastructure, such as, computer hardware, software and networking system, which includes electronic gadgets, computers, printers, barcode readers, scanners, laser printers, projectors, electric backup power systems and photocopying machines.

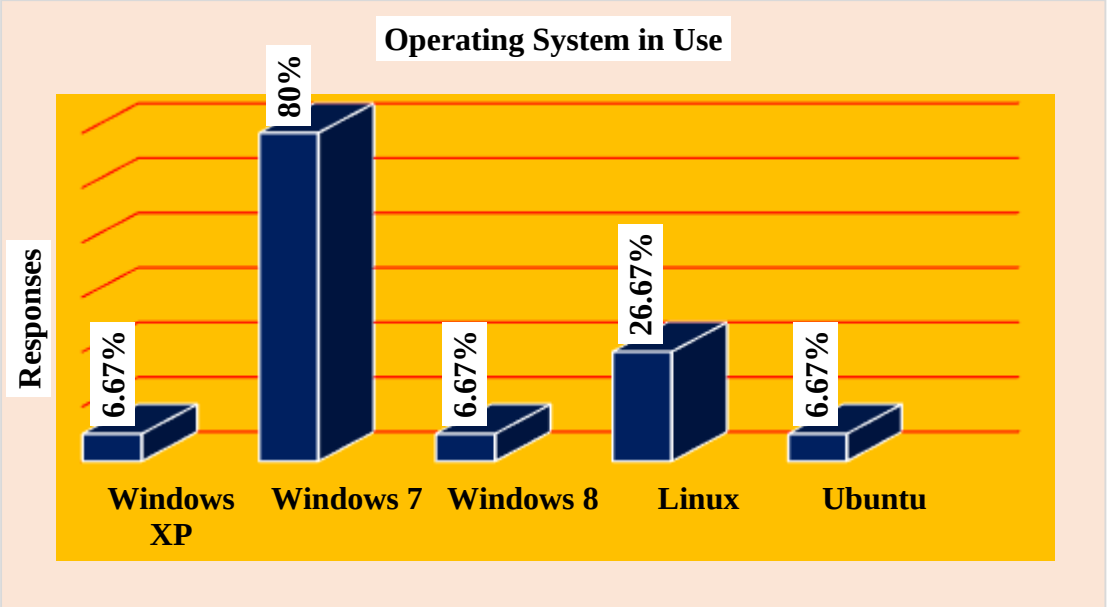
The Table 4.2.9 and Figure 4.2.9 highlights the infrastructural facilities available in the University Libraries. It includes number of electronic hardware equipment and presents a University-wise calculation of electronic equipment and infrastructural facilities available in University Libraries.

The result observed that among the University Libraries, JNU library has a rich collection (1,518) of electronic gadgets and equipments followed by BHU 432, DU 412, IGNOU 327, AU 250, AMU 186 and JMI 143. Further, it has also been observed that more than 50% of the University Libraries have less than one hundred electronic gadgets and equipment to operate various activities. The analysis clearly highlights that libraries of the Delhi region have a rich collection of various hardware equipment among the Central University Libraries in North India.

Table: 4.2.10: Operating Systems Used by the University Libraries

S. No.	Operating System use in Central University Libraries	No. of Responses	Percentage N= 15
1.	Windows XP	1	6.67%
2.	Windows 7	12	80%
3.	Windows 8	1	6.67%
4.	Linux	4	26.67%
5.	Ubuntu	1	6.67%

Figure: 4.2.10: Operating Systems Used by the University Libraries



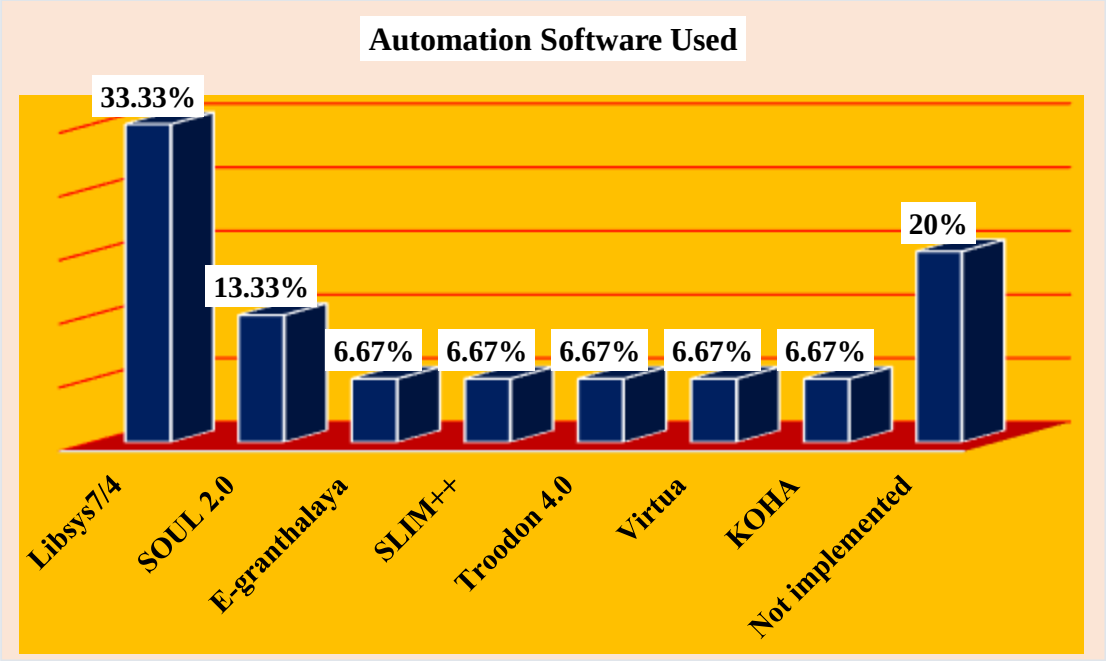
The respondents were asked about the Operating Systems being used in their libraries. The Table 4.2.10 and Figure 4.2.10 reveal that a majority of 12 (80%) University Libraries are using Windows 7 Operating Software, 1 (6.67%) Library is using Windows XP and 1 (6.67%) Library is using Windows 8 respectively. It has also been observed that 4 (26.67%) Libraries are using Linux Open Source Operating System and 1 (6.67%) Library is using Ubuntu. Therefore, it is clear that a few University Libraries are using Open Source Operating System.

Table: 4.2.11: Software Used in Central University Libraries

S. No.	Name of University	Library Automation Software	Library Digitization Software
1.	AMU	Libsys 7	----
2.	AU	Libsys 4	----
3.	BBAU	----	----
4.	BHU	SOUL 2.0	Tech Focus
5.	CU-HP	SOUL 2.0	----
6.	CU-HR	E-granthalaya	----
7.	CUJ	Libsys 7	D-space

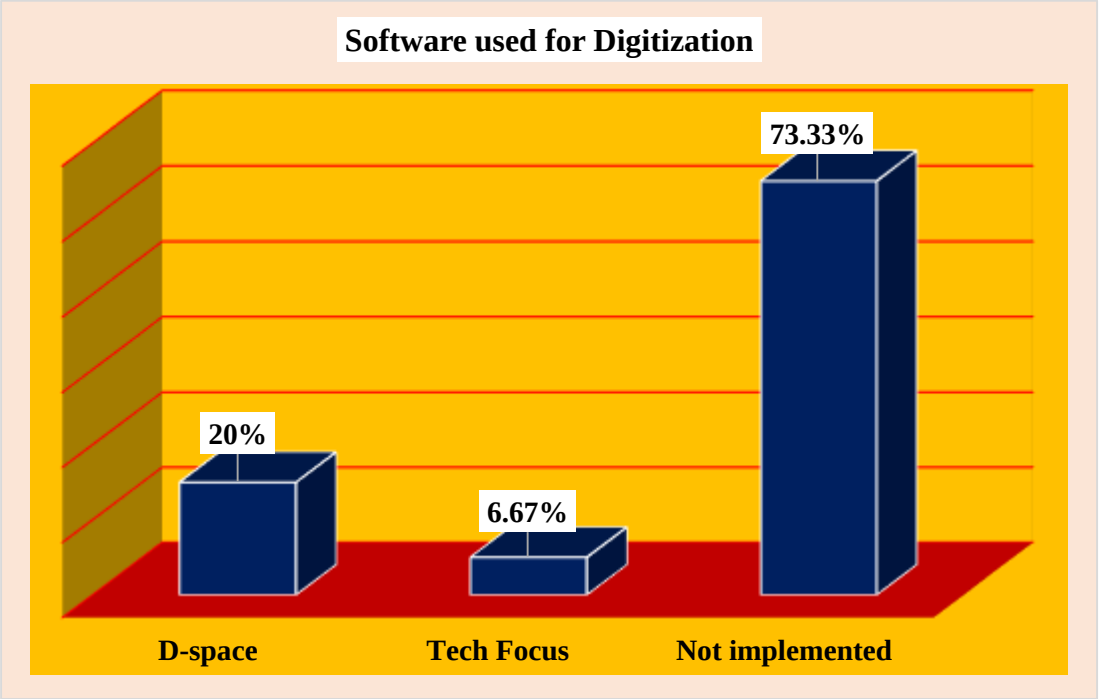
8.	CUK	----	----
9.	CUP	SLIM++	----
10.	DU	Troodon 4.0	D-space
11.	HNBGU	----	----
12.	IGNOU	Libsys 4	----
13.	JMI	Libsys 7	----
14.	JNU	Virtua	D-space
15.	SAU	KOHA	----

Figure: 4.2.11.1: Automation Software Used in Central University Libraries



The respondents were asked to indicate the name of Software being used in the libraries. The above Table 4.2.11 Figure 4.2.11.1 exhibits that a majority of 5 (33.33%) University Libraries are using Libsys7/4 software package, 2 (13.33%) University Libraries are using SOUL and 6 (40%) University Libraries are using different types of library software like; E-Granthalaya, SLIM++, Troodon 4.0, Virtua and KOHA, Whereas 3 (20%) University Libraries have not been automated yet.

Figure: 4.2.11.2: Software Used for Library Digitization

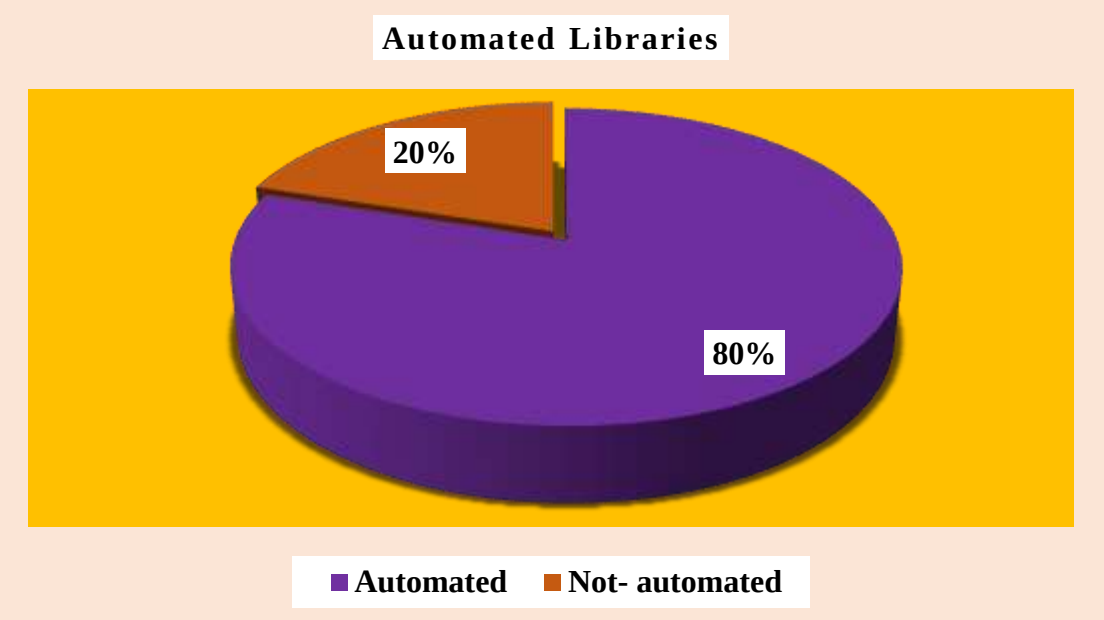


The Table 4.2.11 and Figure 4.2.11.2 also indicates that out of 15 University Libraries merely 4 (26.67%) University Libraries are digitized and using D-space and Tech Focus; which on the other hand a few libraries mentioned that they have plans for digitization in the near future; while a number of the libraries have no such plan for digitization of the resources. The result of the study clearly indicates that a majority of the University Libraries have not implemented Digitization/Content Management Software to develop their information resources into digital format although digitization is the most imperative requirement in the present competitive global ICT environment to improve library efficiency and fulfils users' diverse information needs.

Table: 4.2.12: Automation in the University Libraries

S. No.	Name of University	Automated (%)	Not-automated (%)
1.	AMU	√	----
2.	AU	√	----
3.	BBAU	----	√
4.	BHU	√	----
5.	CU-HP	√	----
6.	CU-HR	√	----
7.	CUJ	√	----
8.	CUK	----	√
9.	CUP	√	----
10.	DU	√	----
11.	HNBGU	----	√
12.	IGNOU	√	----
13.	JMI	√	----
14.	JNU	√	----
15.	SAU	√	----
Total		**12 (80%)**	**3 (20%)**

Figure: 4.2.12: Automation in the University Libraries

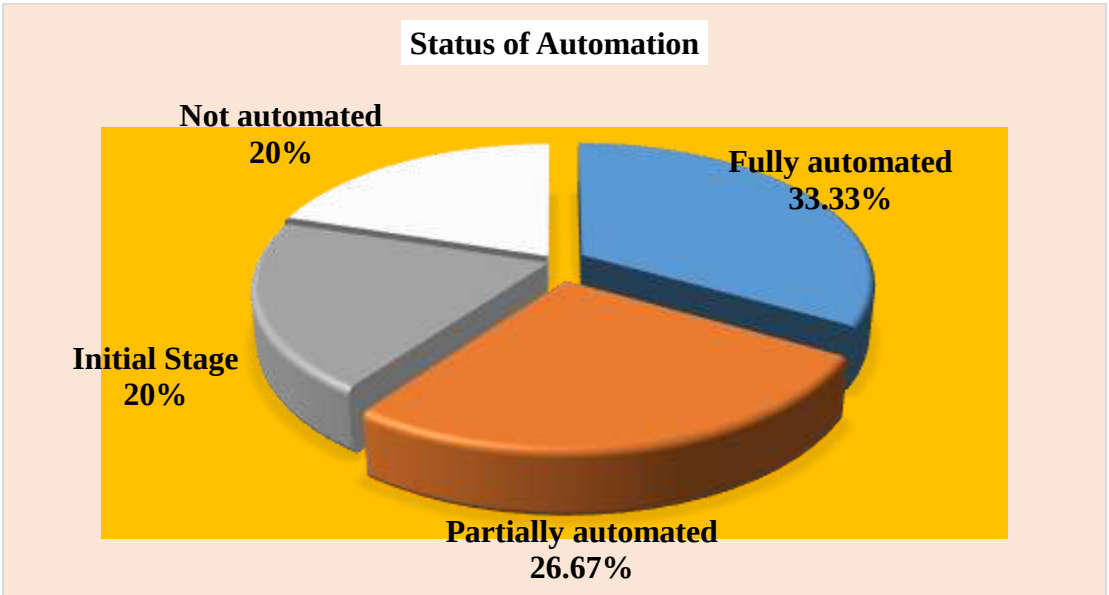


The respondents were asked to know about the existing position of library automation application in the Central University. The Table 4.2.12 and Figure 4.2.12 reveals that the status of automation in the Central University Libraries of North India. Of the 15 University Libraries 12 (80%) University Libraries are automated which include AMU, AU, BHU, CU-HP, CU-HR, CUJ, CUP, DU, IGNOU, JMI, JNU, SAU, whereas BBAU, CUK and HNBGU 3 (20%) University Libraries are not automated. It is clear that a majority of University Libraries have adopted automation of their libraries.

Table: 4.2.13: Present Status of Library Automation in University Libraries

S. No.	Present Status of Automation	No. of Libraries	Percentage N= 15
1.	Fully automated	5	33.33%
2.	Partially automated	4	26.67%
3.	Initial Stage	3	20%
4.	Not automated	3	20%
Total		**15**	**100%**

Figure: 4.2.13: Present Status of Library Automation in University Libraries

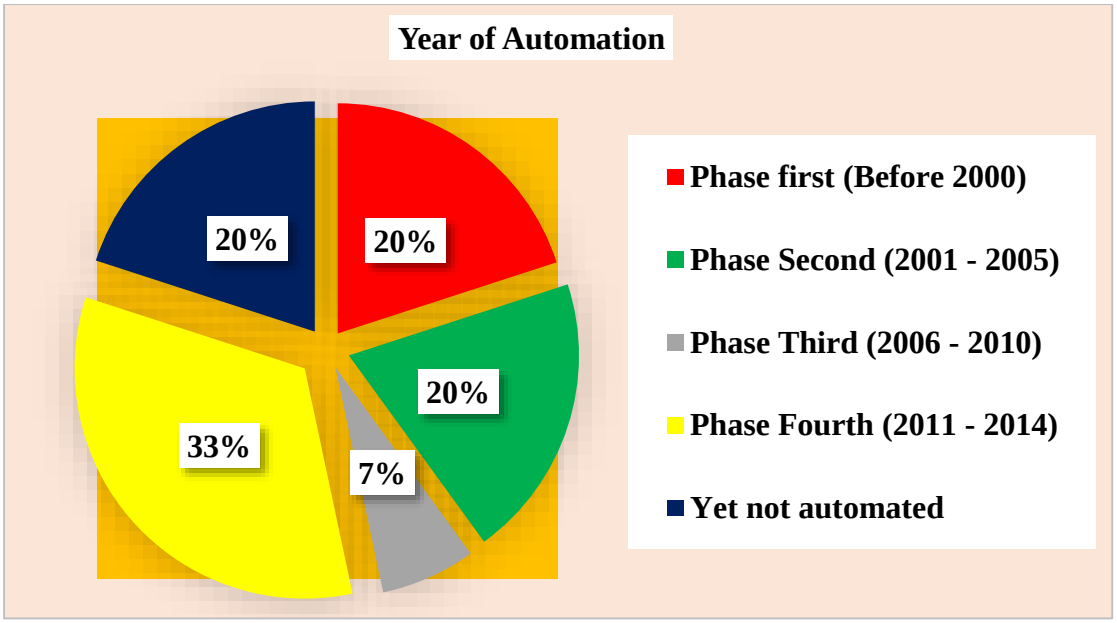


The respondents were asked to indicate the extent of their status of automation in the University Libraries. In the Table 4.2.13 and Figure 4.2.13 it has been noticed that a majority of 5 (33.33%) of University Libraries are fully automated, 4 (26.67%) were found to be partially automated, 3 (20%) of libraries were under progress and 3 (20%) of University Libraries were not automated.

Table: 4.2.14: Phase-wise Development of Automation Process

S. No.	Year of Automation	No. of Libraries	Percentage
1.	Phase first (Before 2000)	3	20%
2.	Phase Second (2001 - 2005)	3	20%
3.	Phase Third (2006 - 2010)	1	6.67%
4.	Phase Fourth (2011 - 2014)	5	33.33%
5.	Yet not automated	3	20%
Total		**15**	**100**

Figure: 4.2.14: Phase-wise Development of Automation Process



The Table 4.2.14 and Figure 4.2.14 displays the phase-wise development of automation in the North Indian Central University Libraries. The results indicate that a majority of 5 (33.33%) University Libraries have been automated in the fourth phase (2011- 2014), 3 (20%) University Libraries have been automated in the first phase (before 2000), 20% University Libraries have been automated in the second phase (2001-2005) and 1 (6.67%) University Library has been automated in the third phase (2006-2010), whereas, 3 (20%) University Libraries have not yet been automated. It is clearly evident that a majority of the University libraries have been automated in the Fourth Phase (2011-2014).

H1 "Automation Process is very slow in the Libraries under study"

Out of the 15 University Libraries, only 5 (33.33%) Libraries are fully automated, 4 (26.67%) are found to be partially automated, 3 (20%) libraries are under progress and 3 (20%) University Libraries are not automated. **(Table- 4.2.13)**

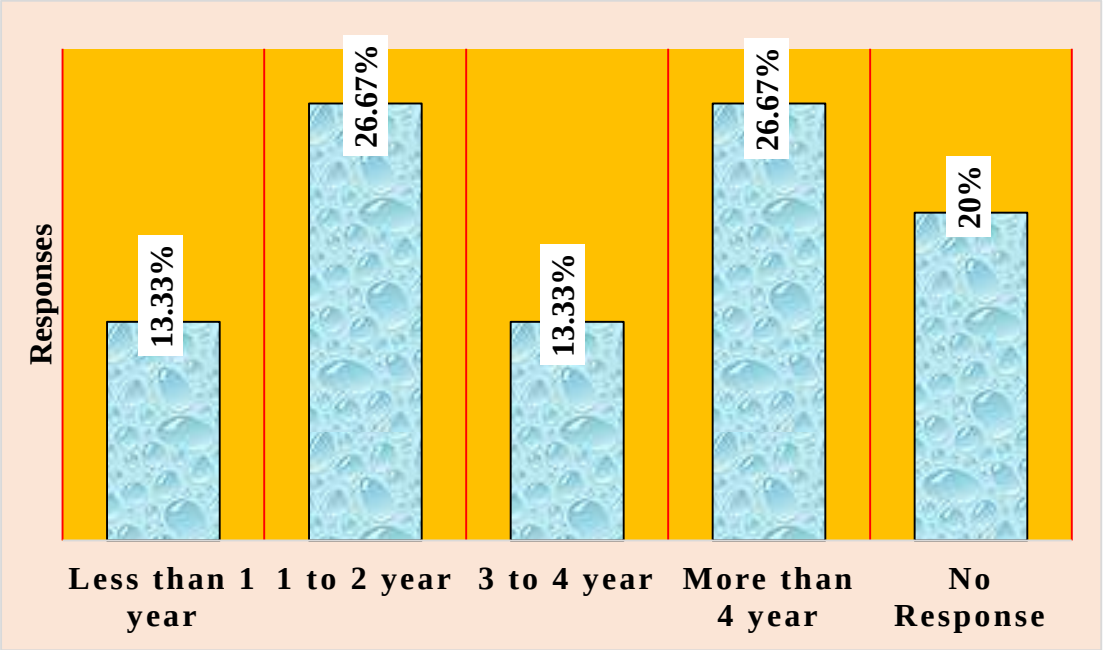
It has been found that highest majority of the University Libraries completed their automation process in only one phase which is in the fourth phase (2011-2014) although the remaining phase of the development indicates a very slow and sluggish development of the automation process. **(Table- 4.2.14)**

Therefore, hypothesis has been proved and accepted.

Table: 4.2.15: Time Consumed in Retrospective Conversion

Duration	**Less than 1 year**	**1 to 2 year**	**3 to 4 year**	**More than 4 year**	**Not Responded**
Name of the University	CU-HR, CUJ	AMU, DU, CUP, IGNOU	AU, JMI	BHU, JNU, CU-HP, SAU	BBAU, CUK, HNBGU
Responses	2 (13.33%)	4 (26.67%)	2 (13.33%)	4 (26.67%)	3 (20%)

Figure: 4.2.15: Time Consumed in Retrospective Conversion



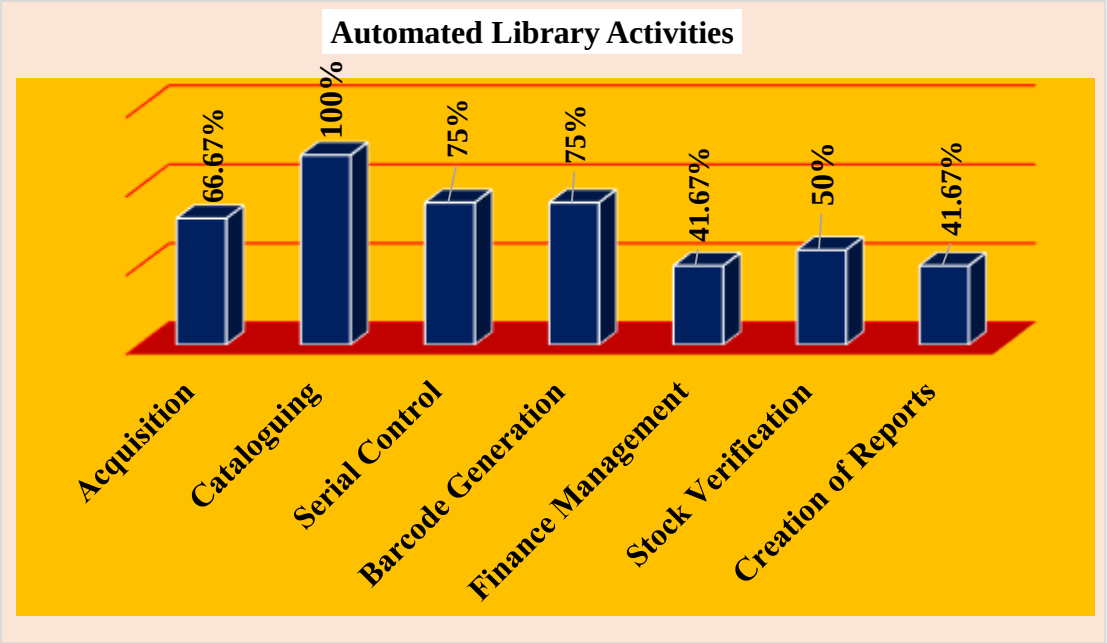
The respondents were asked to indicate the time consumed in retrospective conversion (automation process) in the University Libraries. The Table 4.2.15 and Figure 4.2.15 presents that out of 15 University Libraries, a majority of 4 (26.67%) University Libraries completed their automation work in the duration of 1 to 2 years and in more than 4 years, followed by 2 (13.33%) University Libraries that completed their automation work in the duration of 3 to 4 years and further, 2 (13.33%) University Libraries who completed their automation work in less than 1 year of duration whereas, 3 (20%) University Libraries did not respond due to non-availability of automation in their libraries.

Table: 4.2.16 Library Automated Activities

S. No.	Activities	Responses (N= 12)	
1.	Acquisition	8 (66.67%)	**Chi square value ($\chi 2$)= 5.111**
2.	Cataloguing	12 (100%)	
3.	Serial Control	9 (75%)	
4.	Barcode Generation	9 (75%)	
5.	Finance Management	5 (41.67%)	
6.	Stock verification	6 (50%)	
7.	Creation of Reports	5 (41.67%)	

Degree of freedom (df) = 6, Level of significance 0.005, $\chi 2$ Table value= 18.548

Figure: 4.2.16: Automated Library Activities



The respondents were asked about the different modules of library software, which have proved to be essential for their daily routine library operations. The Table 4.2.16 and Figure 4.2.16 shows that all automated University Libraries 12 (100%) are using cataloguing module, 9 (75%) libraries are using Serial Control, further 9 (75%) libraries utilize Barcode, 8 (66.67%) libraries have been using acquisition, 6 (50%) libraries use for Stock Verification and merely 5 (41.67%) are using software for

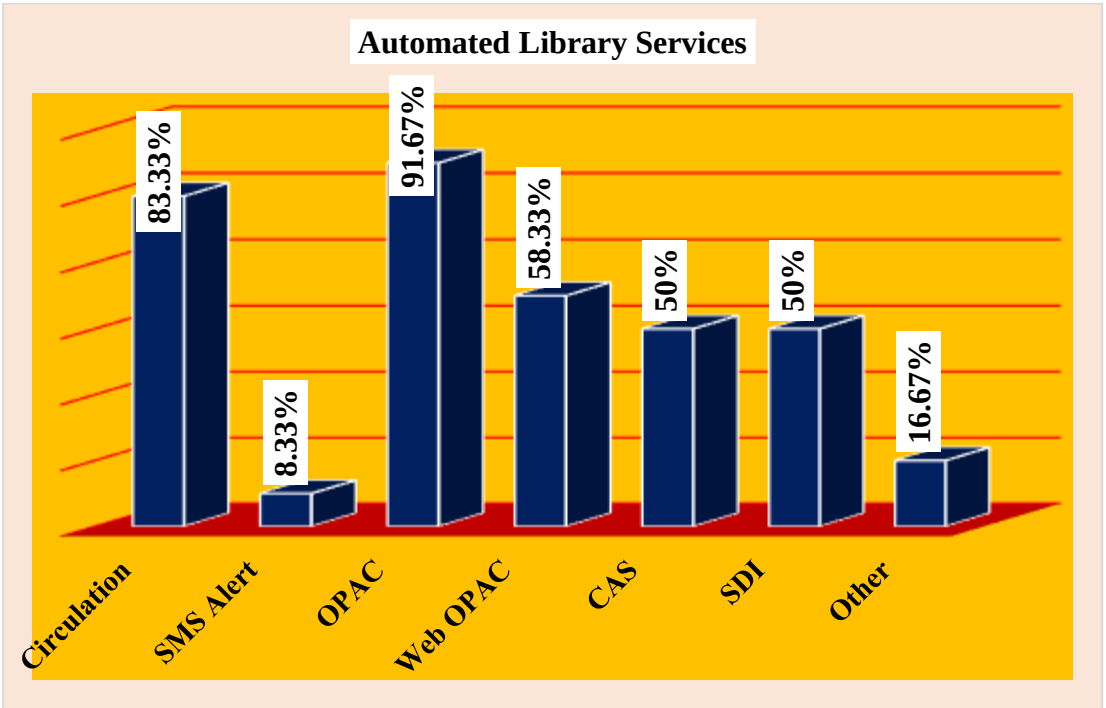
financial management and further, 5 (41.67%) use for report generation. It is noticed that all the major core activities or functions are available in most of the library software while; some locally developed library software has no provision of Barcode Generation and have been found to be lacking in certain activities, such as, creation of reports and financial management.

4.2.17. Automated Services Provided by the University Libraries

S. No.	Services	Responses (N= 12)	
1.	Circulation	10 (83.33%)	
2.	SMS Alert	1 (8.33%)	
3.	OPAC	11 (91.67%)	**Chi-square value ($\chi 2$)= 17.211**
4.	Web OPAC	7 (58.33%)	
5.	CAS	6 (50%)	
6.	SDI	6 (50%)	
7.	Other	2 (16.67%)	

Degree of freedom (df) = 6, Level of significance 0.005, $\chi 2$ Table value= 18.548

Figure: 4.2.17: Automated Services Provided by the University Libraries



The Table 4.2.17 and Figure 4.2.17 exhibits that out of 12 the automated University Libraries 11 (91.67%) Libraries are providing OPAC services, 10 (83.33%) Libraries are providing circulation service. It has also been observed that 7 (58.33%) Libraries are providing Web OPAC service to their users, 6 (50%) Libraries have been providing CAS and further, 6 (50%) Libraries are providing SDI service, 2 (16.67%) Libraries are providing others services and only 1 (8.33%) Libraries providing SMS alert services to the users respectively.

It is also observed that all the major core library services are available in most of the library software while; some locally developed library software has no provision of SMS alerts and are lacking some library services such as Web OPAC and SDI service.

Library Automation Activities and Services: Usually library automation software are being used with the help of computer systems to manage various library functions, such as, acquisition, circulation, cataloguing, serial controls and OPAC. This process is required essentially in libraries to cope up with the multi-dimensional users information needs, the enormously increasing of various format of information resources, problems of their acquisition, storage retrievals and dissemination of information resources. Therefore, automation process in libraries covers essentially two major functional areas, the first is organization and management of available library information resources and the second is to access various types of available library and information resources. These two functional areas deal with library activities and services respectively, which are highlighted in the above table and figure.

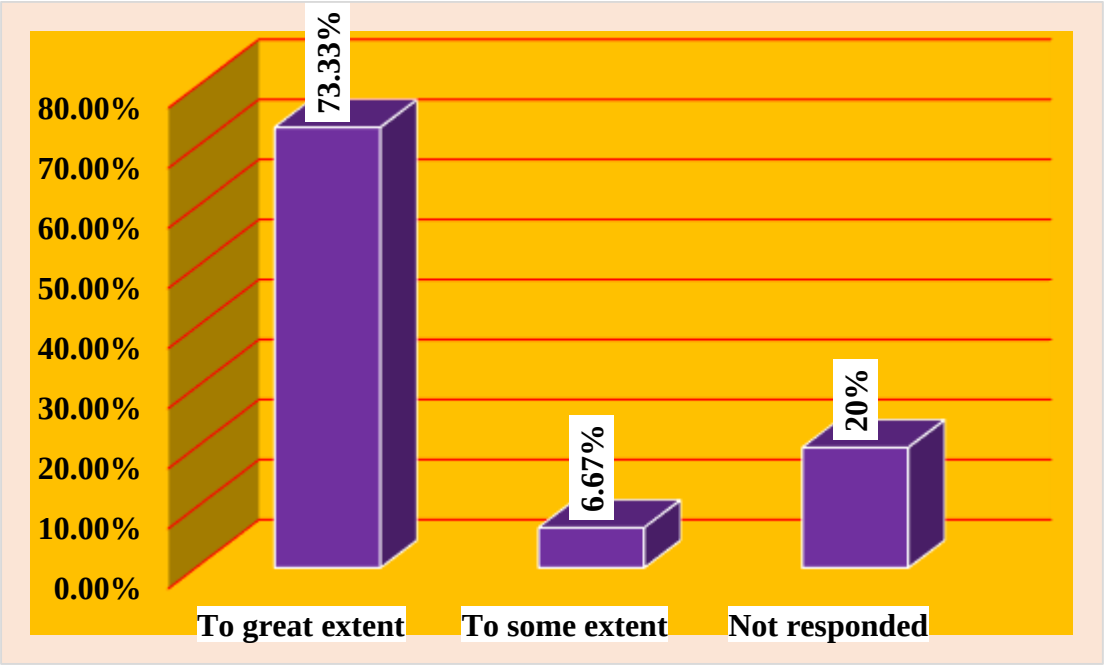
H2 "Library Software fulfils various requirements of the Libraries"

The Table 4.2.16 and 4.2.17 indicate the hypothesis results by applying single table Chi-square formula on the activities and services providing through library software. The result found that the Chi-Square calculated value is smaller than Chi-square critical (table) value. The results of hypothesis testing show that there is no significant difference in the opinion about required activities and services provided through library software. It is clear that library software fulfils various requirements of the libraries. Therefore, above stated hypothesis has been proved and accepted.

Table: 4.2.18: Library Software Enables Improvement of Library Services

Sl. No.	Preference	Responses	Percentage
1.	To great extent	11	73.33%
2.	To some extent	1	6.67%
3.	Not responded	3	20%
Total		**15**	**100%**

Figure: 4.2.18 Library Software Enables Improvement of Library Services



The result of Table 4.2.18 and Figure 4.2.18 indicates that a majority of 11 (73.33%) respondents preferred "to a great extent". They believe automation process enables improvement of library services and merely 1 (6.67%) respondent preferred "to some extent", whereas a fair number of 3 (20%) of the respondents did not respond.

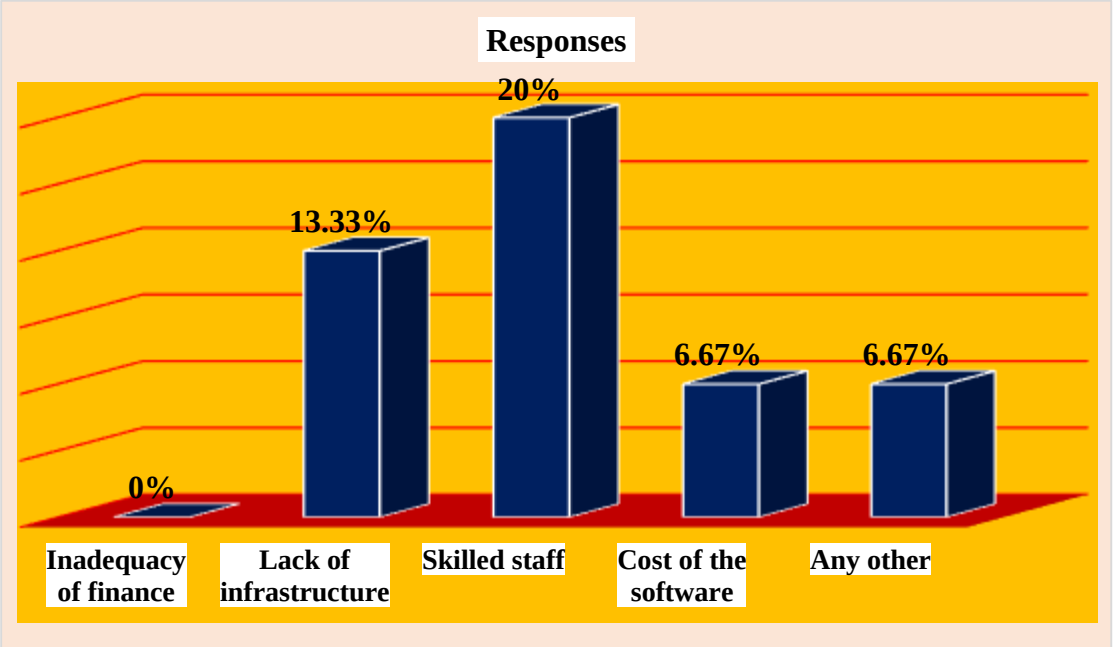
H3 "Application of Library software helps to great extent in the improvement of services provided by the Libraries"

The Table 4.2.18 indicates hypothesis result about Library Software that it helps to great extent in the improvement of services. The result of hypothesis testing shows that most of the respondents firmly believed in the statement that library software helps to a great extent in the improvement of services provided by the libraries. Thus the above stated hypothesis has been proved and accepted.

Table: 4.2.19: Reasons for Non-automation

Reasons for not automation	**BBAU**	**HNBGU**	**CUK**
Inadequate finance	----	----	----
Lack of infrastructure	Yes	----	Yes
Lack of Skilled staff	Yes	Yes	Yes
Cost of software	Yes	----	----
Other	Yes	----	----

Figure: 4.2.19: Reasons for Non-automation

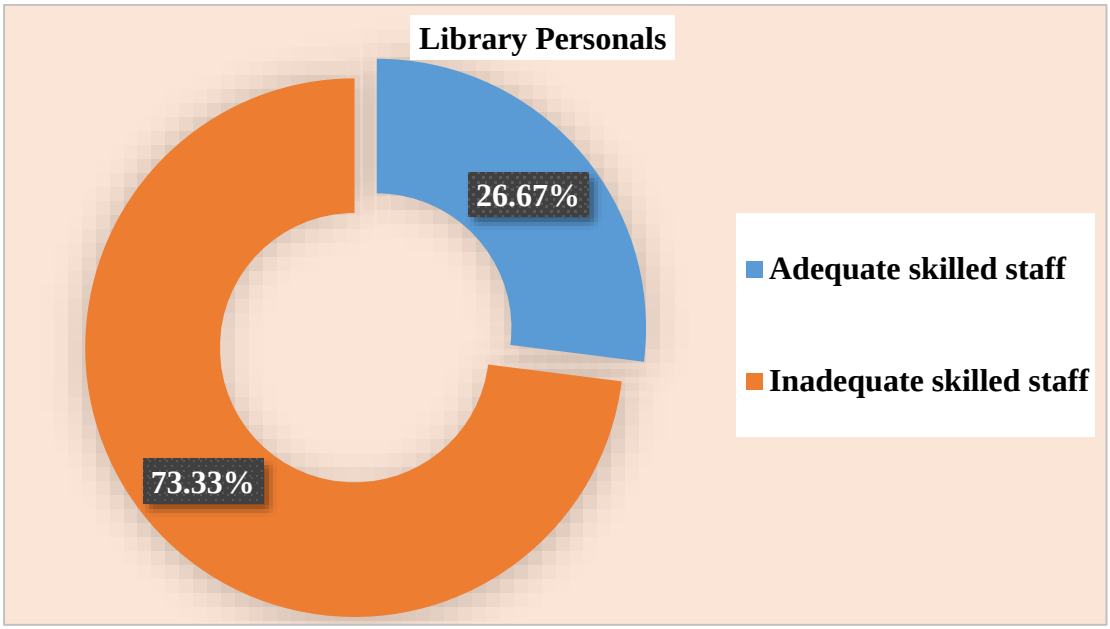


The respondents were asked to mention the reason for non-automation of the University Libraries. The Table 4.2.19 and Figure 4.2.19 illustrates that a majority of 3 (20%) University Libraries indicate towards "lack of library staff", 2 (13.33%) University Libraries indicate mentioned "lack of infrastructures", 1 (6.67%) University Library indicate "cost of the software" and 1 (6.67%) University Library indicate to "any other", whereas, no response was received for "lack of finance". Therefore, it is clear that lack of skilled staff emerged as the main reason, which is responsible for non-automated the libraries.

Table: 4.2.20: Availability of Skilled Library Staff

Sl. No.	Personals	No. of Libraries	Percentage
1.	Adequate skilled staff	4	26.67%
2.	Inadequate skilled staff	11	73.33%
Total		**15**	**100%**

Figure: 4.2.20: Availability of Skilled Library Staff

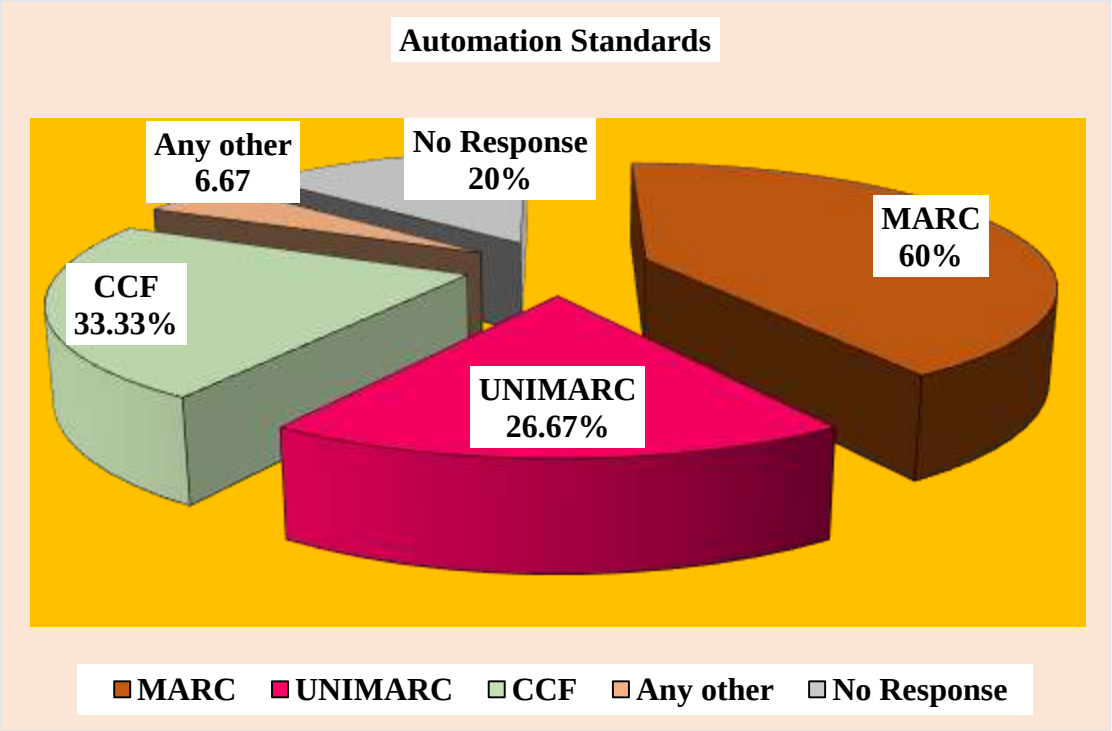


The respondents were asked to explore the availability of skilled library personals for automation, digitization and networking process in the University Libraries. The Table 4.2.20 and Figure 4.2.20 shows that a majority of 11 (73.33%) libraries are indicative towards inadequate staff for execution of the automation, digitization and networking process, 4 (26.67%) libraries indicate adequate skill staff. It is observed that inadequate skilled staff is actually the major problem that affects the application of library software. It is due to this reason tha a majority of the libraries are surviving with the lack of skilled staff.

Table: 4.2.21: Standard Formats Supports by the Library Software

S. No.	Automation Standards	No. of Responses (N=15)	Percentage
1.	MARC	9	60%
2.	UNIMARC	4	26.67%
3.	CCF	5	33.33%
4.	Any other	1	6.67%
5.	No Response	3	20%

Figure: 4.2.21: Standard Formats Supports by the Library Software

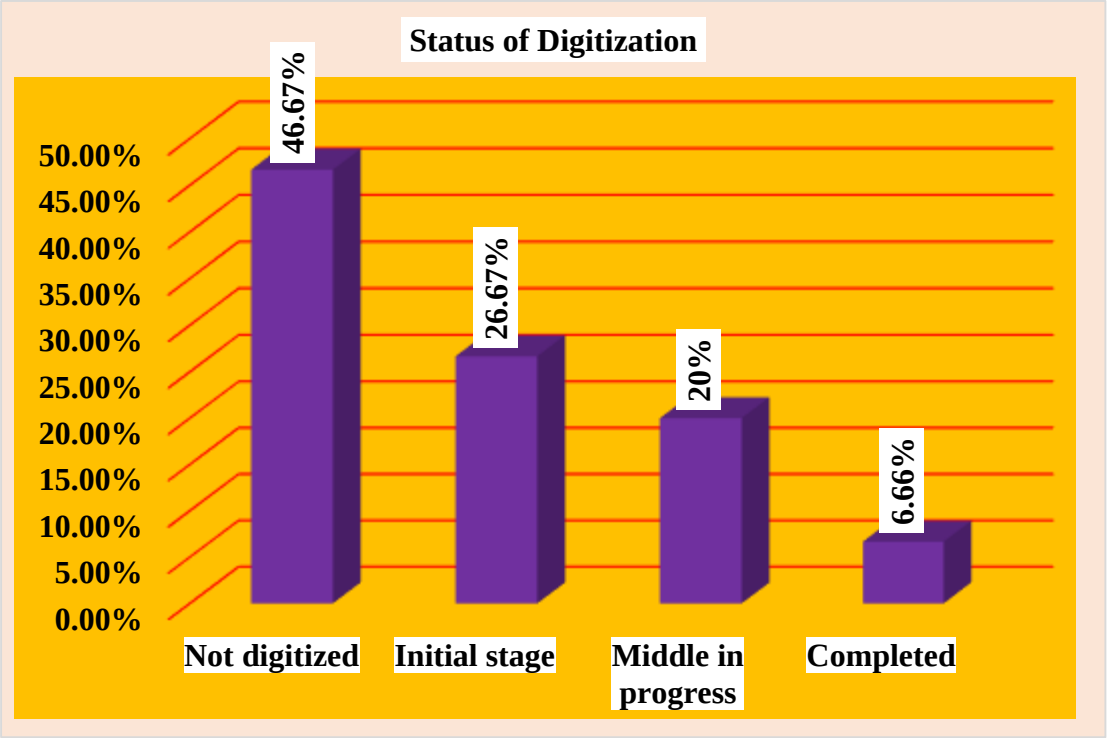


The respondents were asked to mention the standard format supported in automation software among the University Libraries. The Table 4.2.21 and Figure 4.2.21 depicts that a majority of 9 (60%) University Libraries are supporting MARC format (Machine Readable Catalogue), 5 (33.33%) Libraries are supporting CCF (Common Communication Format) standard, 4 (26.67%) libraries are supporting UNIMARC standard format and merely 1(6.67%) Library are supporting "other" standard formats in the automation software; while, the other 3 (20%) of University Libraries have not as yet started the automation process. Therefore, the result of the above table indicates that most of the University Libraries are supporting more than one standard format, some of the University Libraries are using a single standard format in the automation process.

Table: 4.2.22: Status of Library Digitization

Status	Responses	Name of the Universities
Not digitized	7 (46.67%)	AMU, BBAU, CU-HP, CUK, CUP, IGNOU and SAU
Initial stage	4 (26.67%)	AU, CU-HR, HNBGU, JMI
Middle in progress	3 (20%)	BHU, CUJ, DU
Completed	1 (6.66%)	JNU

Figure: 4.2.22: Status of Library Digitization



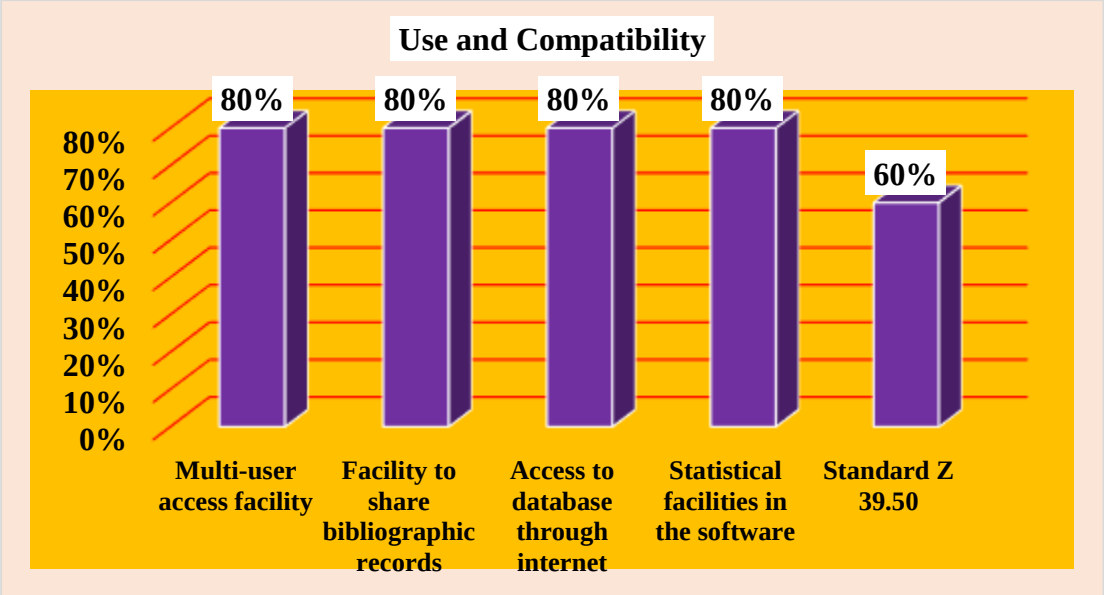
The librarians were asked about the digitization of the University Libraries to ascertain their digitization status. The Table 4.2.22 and Figure 4.2.22 exhibits that 7 (46.67%) University Libraries are not digitized and 4 (26.67%) University Libraries indicate digitization of their libraries in the initial stages, 3 (20%) University Libraries indicate digitization in the middle progress and 1 (6.66%) University Libraries indicate fully digitized. It is clear that a majority of the University Libraries

are not digitized. Therefore, the Central Universities Libraries must be digitized to cope up with the ever changing ICT environment.

Table: 4.2.23: Use and Compatibility of Library Software

S. No.	Use and Compatibility	Responses (N= 15)	Percentage
1.	Multi-user access facility	12	80%
2.	Facility to share bibliographic records	12	80%
3.	Access to database through internet	12	80%
4.	Statistical facilities in the software	12	80%
5.	Standard Z 39.50	9	60%

Figure: 4.2.23: Use and Compatibility of Library Software



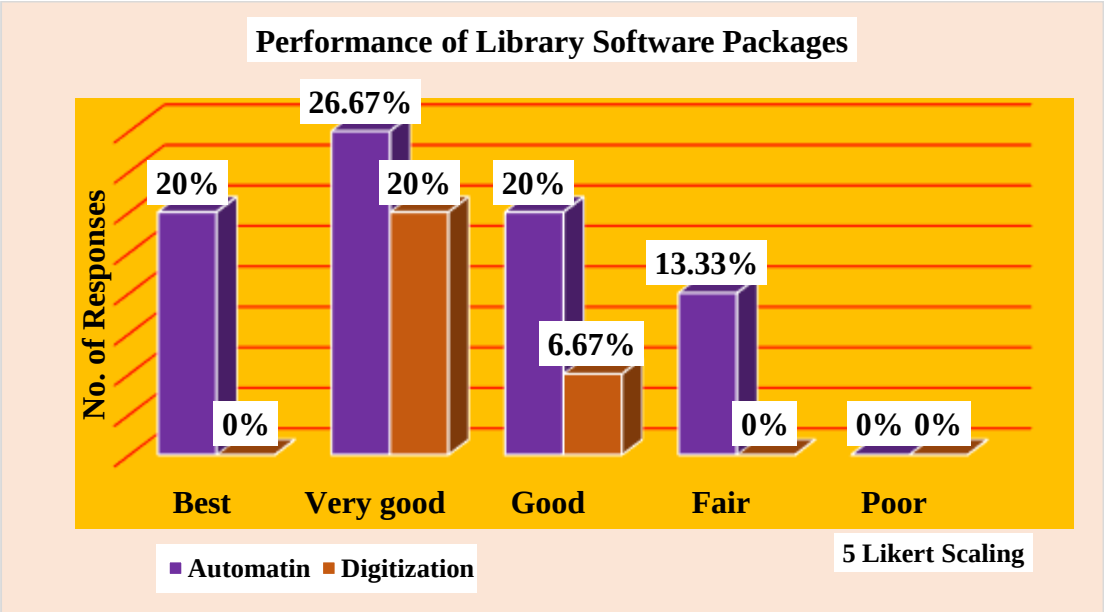
The respondents were asked to offer their opinion and views towards the Use and Compatibility of the Library Software. As the Table 4.2.23 and Figure 4.2.23 reveal that a majority of 12 (80%) libraries indicate that their automation software provide facility of Multi-user Access Facility, a facility to share bibliographic records, access to database through internet and statistical facilities in the software respectively.

Whereas, a good numbers 9 (60%) of the libraries indicate that their automation software compatible and provide access to the Standard Z39.50 for bibliographic description. The table evidently indicates that the majority of responses were indicated that software packages have been very useful in a variety of ways such as in the handling and maintaining of records, managing of E-resources and database and have also been useful in providing efficient services to their users in the libraries. Although, there is a emergent requirement to further improve providing of flawless library services through the widespread application of automation and digitization.

Table: 4.2.24: Performance of Library Software

Performance of the Software (Best= 5, Very good= 4, Good= 3, Fair= 2, Poor= 1)						
Software	**Best**	**Very good**	**Good**	**Fair**	**Poor**	**Total responses**
Automation	3 (20%)	4 (26.67%)	3 (20%)	2 (13.33%)	0 (0%)	12
Digitization	0 (0%)	3 (20%)	1 (6.67%)	0 (0%)	0 (0%)	4

Figure: 4.2.24: Performance of Library Software



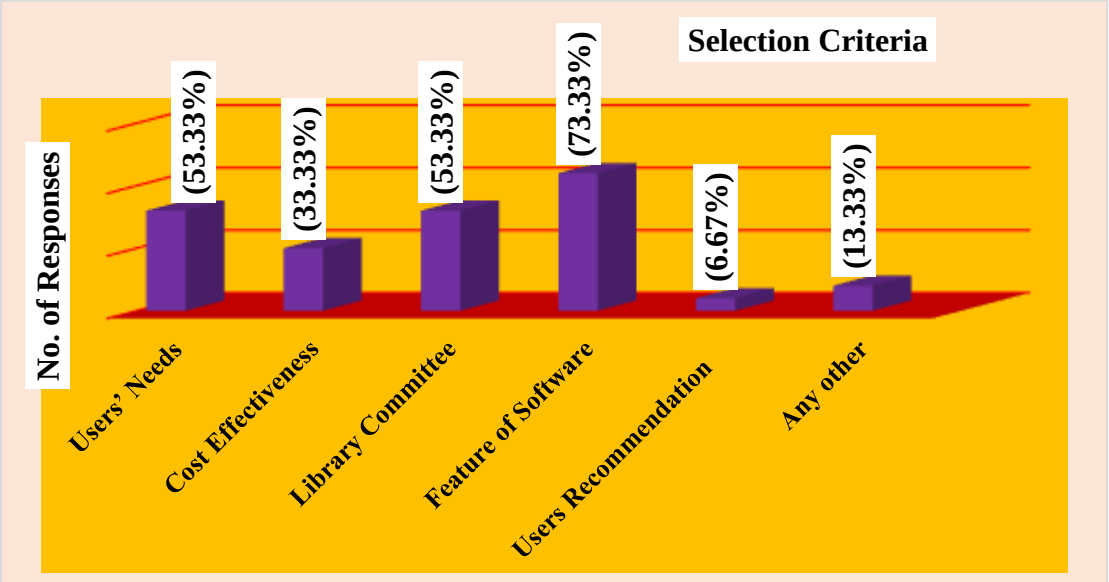
The respondents were asked to observe the performance of library automation and digitization software packages. The Table 4.2.24 and Figure 4.2.24 reveals with reference to the use of automation software that the highest majority of 4 (26.67%) responses are rated as 'very good' for automation, followed by 3 (20%) responses rated as 'best' and also as "good", whereas, none of the responses rated as "poor" about the automation software. As regards digitization, the table also shows that a majority of 3 (20%) responses are rated as "very good" and just 1 (6.67%) response rated as "good" for digitization.

From the above table it is clear that the performance of automation software in most of the University Libraries of North India are quite satisfactory and need to furher improve in this area. Furthermore, the performance of digitization software is not satisfactory; and it is very surprising. It shows the miserable situation about the digitization process in the era of ICT and the increasing demands of digitization of printed resources in the libraries.

Table: 4.2.25: Selection Criteria for Library Software

S. No.	Selection Criteria	No. of Respondents	Percentage
1.	Users' Needs	8	53.33%
2.	Cost Effectiveness	5	33.33%
3.	Features of Software	11	73.33%
4.	Users Recommendation	1	6.67%
5.	Any other	2	13.33%

Figure: 4.2.25: Selection Criteria for Library Software



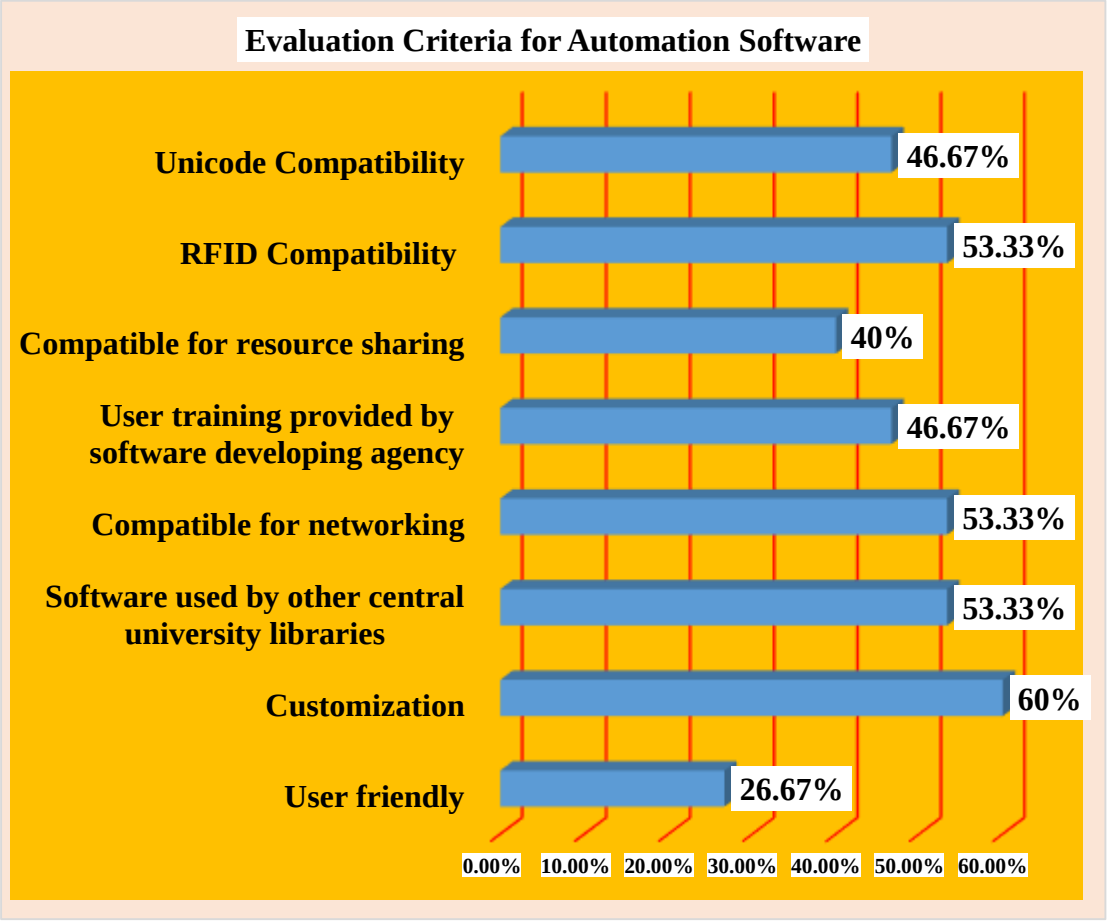
The selection of appropriate library software is the most crucial decision for any librarian for efficicacy of library activities and services. There are various selection criteria for choosing a good quality software, before purchasing a software. The Librarians should consider the following factors such as vendor reliability, system compatibility, sustainability and cost modularity.

To find out the selection criteria for library software, the respondents were asked to mention their opinion about various selection criteria. The analysis of the data as shown in the Table 4.2.25 and Figure 4.2.25 indicates that the majority of 11 (73.33%) University Libraries have selected the library software on the basis of "features of software", 8 (53.33%) libraries have selected on the basis of "users need" and "library committee", 5 (33.33%) libraries selected on the basis of "cost effectiveness", 2 (13.33%) libraries selected on the basis of "any other criteria". From the above table, it is clear that a majority of the University Libraries have selected the library software on the basis of "its features".

Table: 4.2.26: Evaluation Criteria for Library Software

S. No.	Evaluation Criteria	No. of Respondents (N= 15)	Percentage
1.	User friendly	4	26.67%
2.	Customization	9	60%
3.	Software used by other central University libraries	8	53.33%
4.	Compatible for networking	8	53.33%
5.	User training provided by software developing agency	7	46.67%
6.	Compatible for resource sharing	6	40%
7.	RFID Compatibility	8	53.33%
8.	Unicode Compatibility	7	46.67%

Figure: 4.2.26: Evaluation Criteria for Library Software

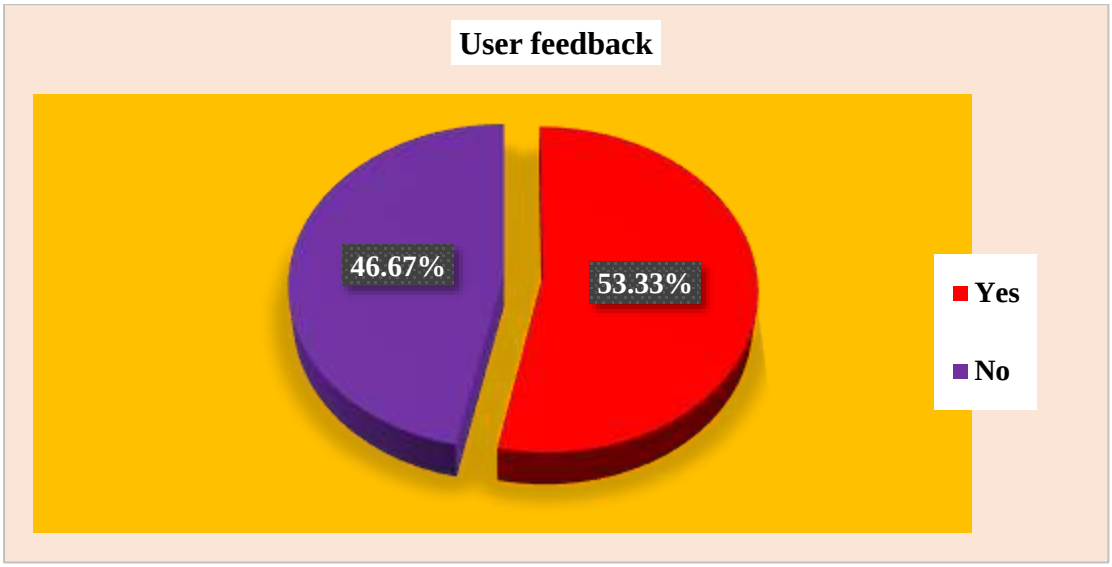


In order to find out the evaluation criteria for Library Software, the respondents were asked to mention their option about various evaluation criteria of software on the basis of features. The Table 4.2.26 and Figure 4.2.26 shows that 9 (60%) of the University Libraries have selected library software on the basis of its "customization" features, 8 (53.33%) libraries selected on the basis of "software used by other Central University Libraries" as well as on the basis of "compatible for networking", 7 (46.67%) libraries selected on the basis of "user's training by the developing agency", 6 (40%) libraries selected on the basis of "compatibility with resource sharing" and 4 (26.67%) libraries selected on the basis of "being user friendly". The results of the study clearly indicate that a majority of the respondents have considered selection criteria for library software such as customization, software used by other Central University Libraries and compatible for networking as much preferred selection criteria.

Table: 4.2.27: User Feedback Facility for Library Software

S. No.	Category	No. of Responses	Percentage
1.	Yes	8	53.33%
2.	No	7	46.67%
Total		**15**	**100%**

Figure: 4.2.27: User feedback facility for Library Software

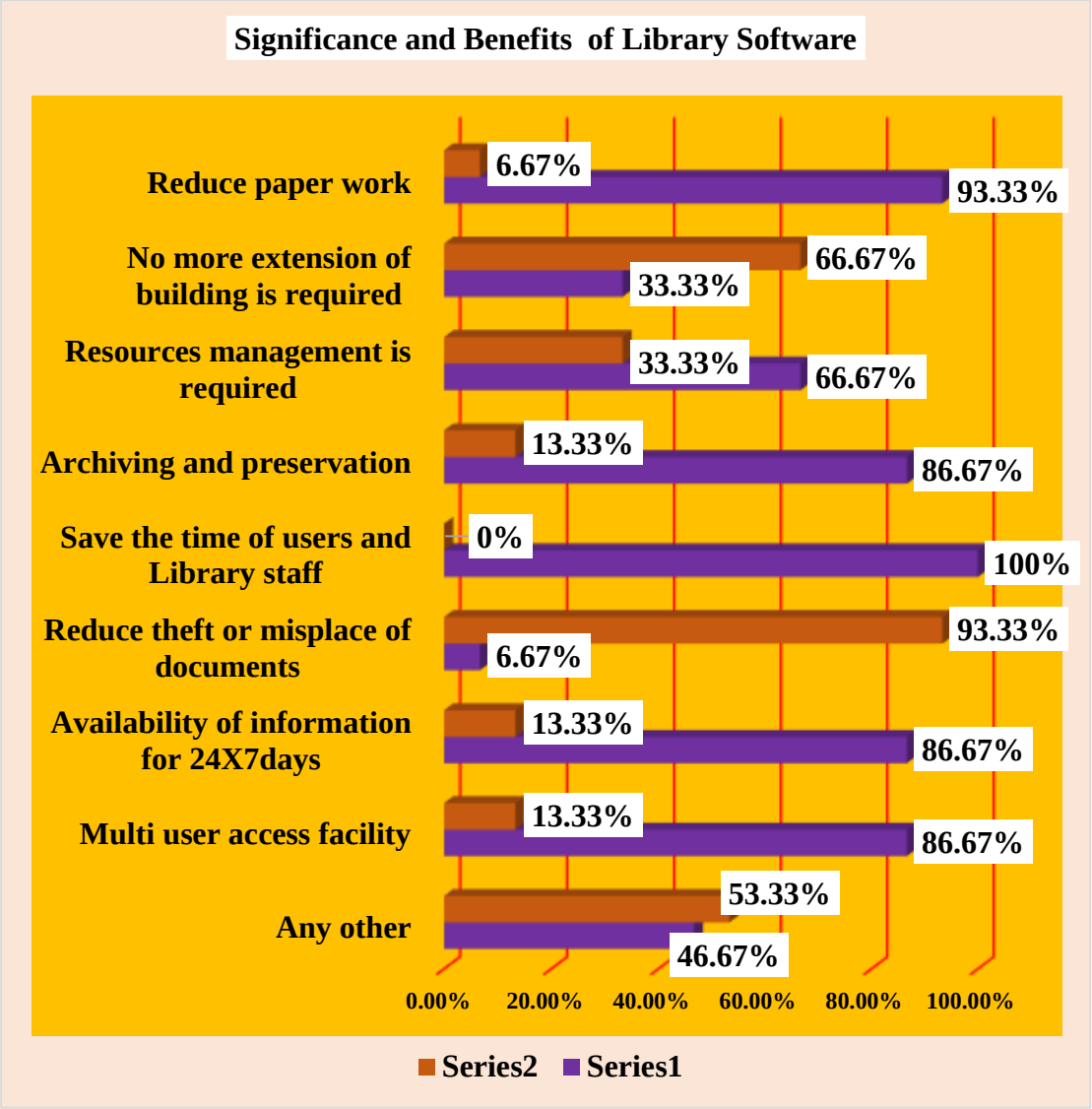


The respondents were also asked to mention whether they collected user's feedback or not regarding the quality of services provided through the library software. The Table 4.2.27 and Figure 4.2.27 exhibits that 8 (53.33%) University Libraries have a provision to collect user's feedback and the remaining 7 (46.67%) University Libraries had no provision to collect user's feedback facility regarding quality of services.

Table: 4.2.28: Significance and Benefits of Library Software

S. No.	Benefits	Yes	No
1.	Reduce paper work	14 (93.33%)	1 (6.67%)
2.	No more extension of building is required	5 (33.33%)	10 (66.67%)
3.	Resources management is required	10 (66.67%)	5 (33.33%)
4.	Archiving and preservation	13 (86.67%)	2 (13.33%)
5.	Save the time of users and Library staff	15 (100%)	0 (0%)
6.	Reduce theft or misplace of documents	1 (6.67%)	14 (93.33%)
7.	Availability of information for 24X7days	13 (86.67%)	2 (13.33%)
8.	Multi user access facility	13 (86.67%)	2 (13.33%)
9.	Any other	7 (46.67%)	8 (53.33%)

Figure: 4.2.28: Significance and Benefits of Library Software



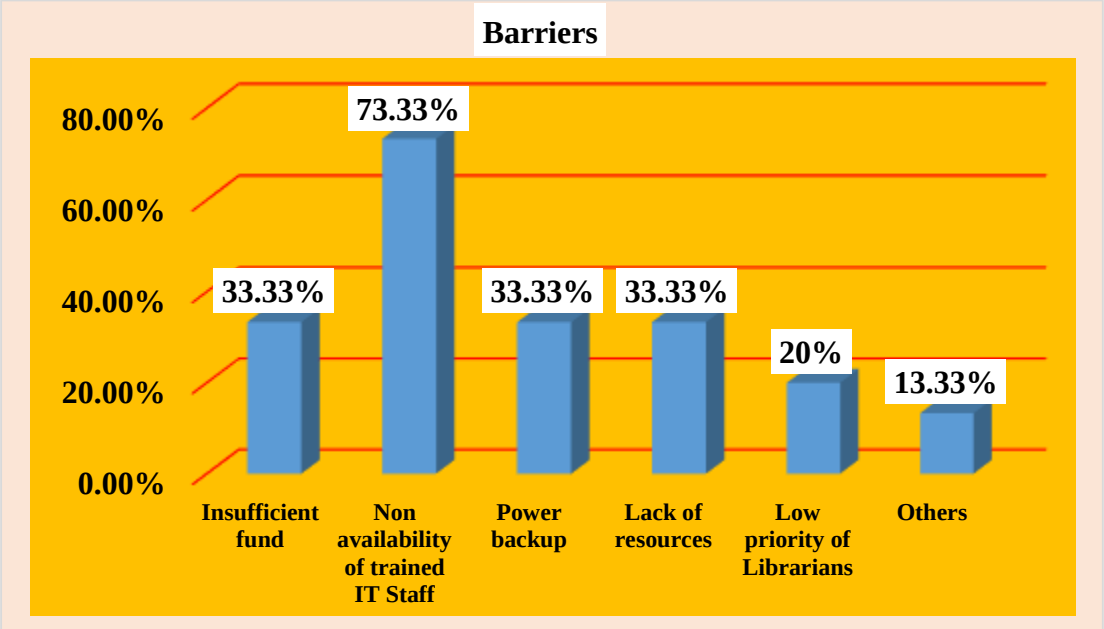
The respondents were asked to indicate their opinion about the significance and benefits of the using library software on the basis of different checkpoint. The table 4.2.28 and figure 4.2.28 shows that there are immense benefits of using library software in libraries. It was observed that a majority of 15 (100%) respondents have preferred to "save the time of users and library staff", followed by 14 (93.33%) respondents who preferred to "benefits of reduce paper work", 13 (86.67%) respondents preferred to "availability of information for 24x7days", "multi user access facility" and "archiving and preservation", 10 (66.67%) respondents preferred

to "Resources management is required", 7 (46.67%) respondents preferred to "any other benefits", 5 (33.33%) respondents preferred to "no more extension of building is required" and just 1 (6.67%) respondents preferred to "reduce theft or misplace of documents".

Table: 4.2.29: Barriers Faced During Library Automation

S. No.	Constraints	No. of Responses	Percentage
1.	Insufficient fund	5	33.33%
2.	Non availability of trained IT Staff	11	73.33%
3.	Power backup	5	33.33%
4.	Lack of resources	5	33.33%
5.	Low priority of Librarians	3	20%
6.	Others	2	13.33%

Figure: 4.2.29: Barriers Faced During Library Automation



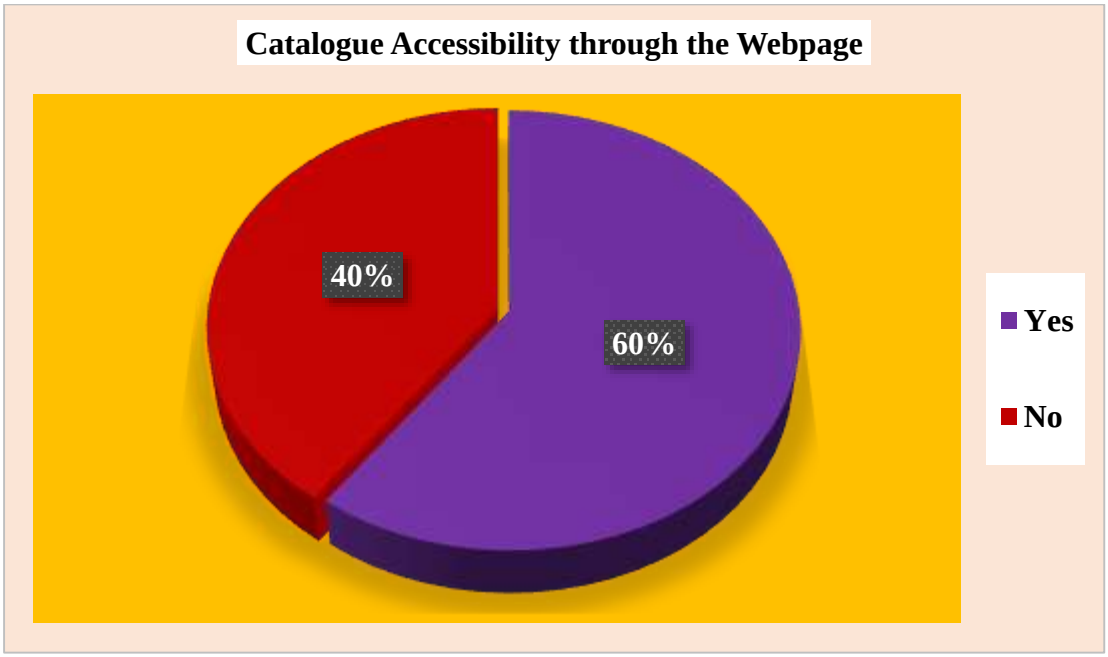
The respondents were asked to indicate the barriers faced during library automation process. The Table 4.2.29 and Figure 4.2.29 shows that a majority of 11 (73.33%) respondents have faced the barrier of "non-availability of trained IT staff", followed

by 5 (33.33%) respondents faced "insufficient funds", "power backup" and "lack of resources" respectively. Furthermore, 3 (20%) respondents have faced "low priority of Librarians" and 2 (13.33%) respondents faced 'others' problems and barriers during the application of library automation in the University Libraries. The results clearly demonstrate that the "Non-availability of trained staff" have been emerged as a major barrier during the library automation process.

Table: 4.2.30: Access Facility of Library Catalogue Through Webpage

S. No.	Catalogue Accessibility through Webpage	No. of Libraries	Percentage
1.	Yes	9	60%
2.	No	6	40%
Total		**15**	**100%**

Figure: 4.2.30: Access Facility of Library Catalogue Through Webpage



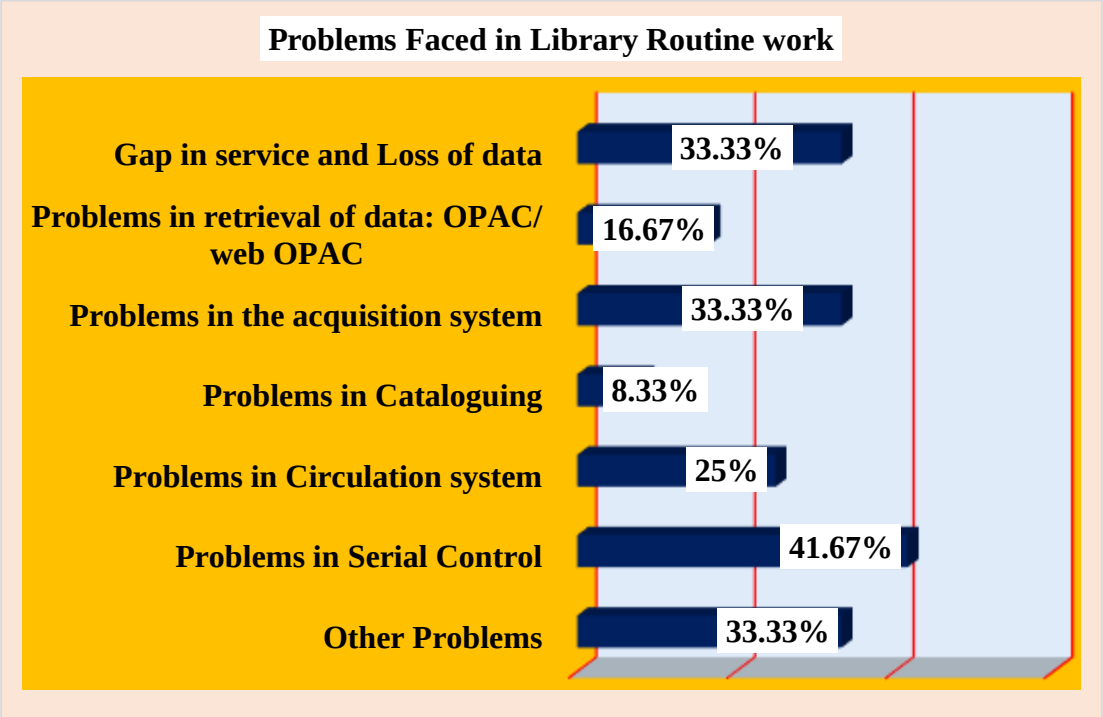
The Table 4.2.30 and Figure 4.2.30 shows whether the library catalogue is accessible through the webpage out of 15 libraries, it is observed that 9 (60%) libraries provide catalogue access facility through the webpage to the users and 6 (40%) libraries do

not provide catalogue accessible facility linked through the webpage. It is observed that most of the libraries provide catalogue accessible or linked through webpage to the users.

Table: 4.2.31: Problems Faced in Library Routine Work in Different Modules

Library Routine Work	Responses (N=12)	Percentage
Gap in service and Loss of data	4	33.33%
Problems in retrieval of data: OPAC/ web OPAC	2	16.67%
Problems in the Acquisition system	4	33.33%
Problems in Cataloguing	1	8.33%
Problems in Circulation system	3	25%
Problems in Serial Control	5	41.67%
Others Problems	4	33.33%

Figure: 4.2.31. Problems Faced in Library Routine Work in Different Modules



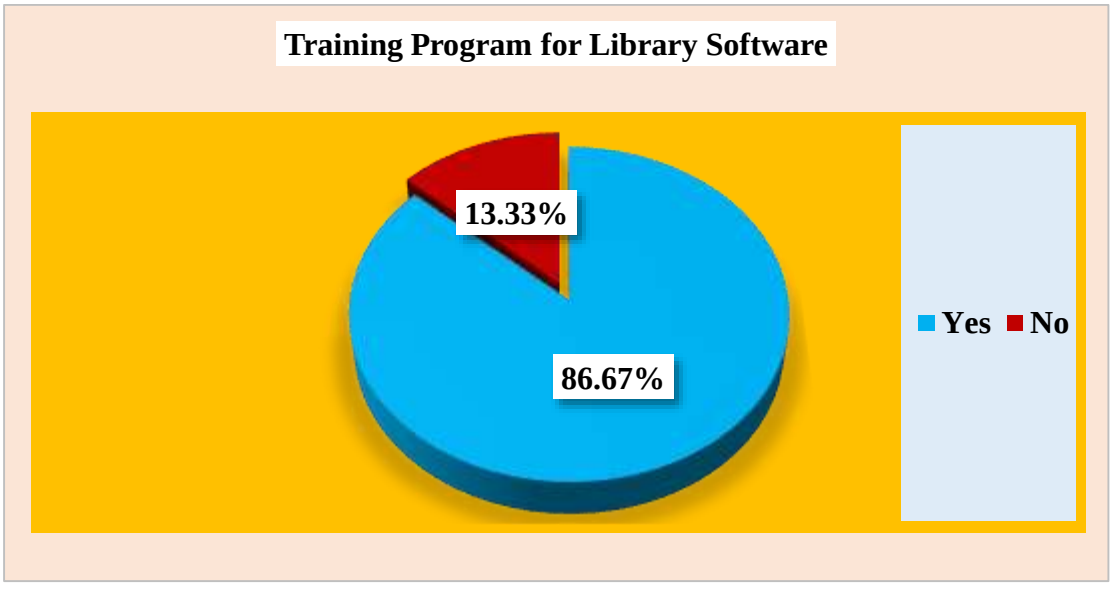
The respondents were asked whether the problems faced during operating in the various software modules. The Table 4.2.31 and Figure 4.2.31 exhibits that a majority

of 5 (41.67%) respondents are facing problems in “serial control module”, followed by 4 (33.33%) respondents who have faced problems in “Gap in service and loss of data”, “problem in acquisition system” and also faced some “Others problems” respectively. The table also shows that 3 (25%) respondents faced problems in “circulation system”, 2 (16.67%) respondents faced the problem in “retrieval of data” and just 1 (8.33%) respondent faced problems in preparing catalogue entry/data feeding. The result of the above table evidently indicates that librarians are faced various types of problems in different modules of individual library software. It clearly indicates that most of the librarians are facing problems in serial control module.

Table: 4.2.32: Staff Allowed to Attend Training Program for Library Software

S. No.	Response in Y/N	No. of Libraries	Percentage
1.	Yes	13	86.67%
2.	No	2	13.33%
Total		**15**	**100%**

Figure: 4.2.32: Staff Allowed to Attend Training Program for Library Software

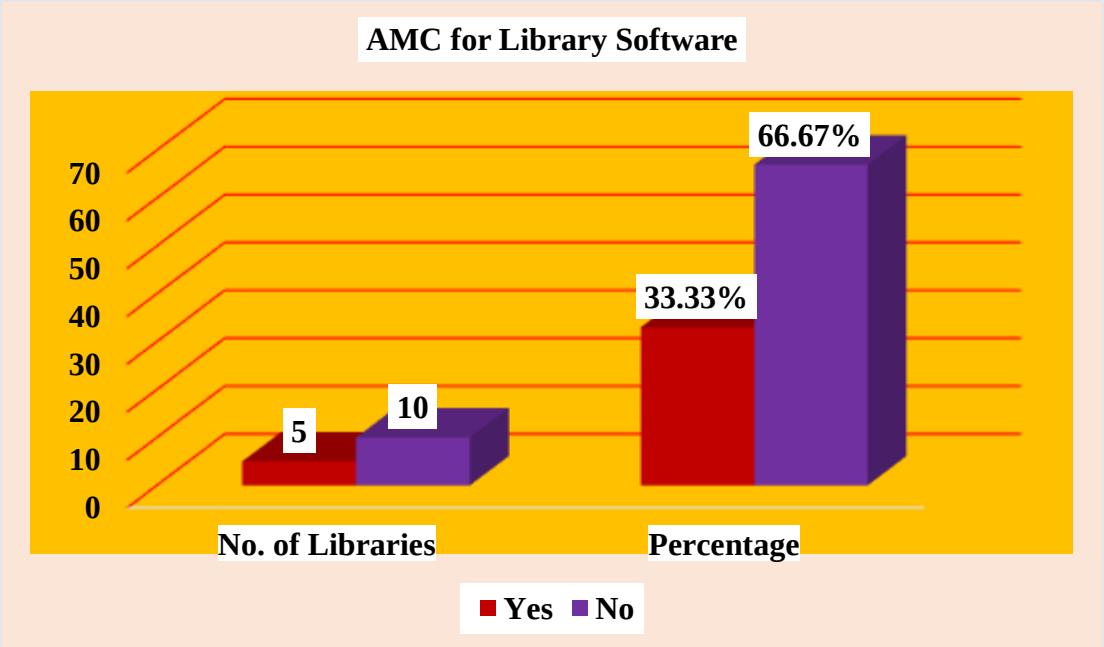


The respondents were asked whether the library staff were allowed to attend training programs related to library software. The Table 4.2.32 and Figure 4.2.32 depicts that 13 (86.67%) libraries allowed their library staff to attend the training program related to library software and the remaining 2 (13.33%) libraries do not allow for this facility to their library staff for attending training program related to library software. Therefore, University Libraries should afford an opportunity to the library staff for adequqte training to enable them to make the maximum utilization of library software.

Table: 4.2.33: Annual Maintenance Contact (AMC) for Library Software

S. No.	AMC	No. of Libraries	Percentage
1.	Yes	5	33.33%
2.	No	10	66.67%
Total		**15**	**100%**

Figure: 4.2.33: Annual Maintenance Contact (AMC) for Library Software

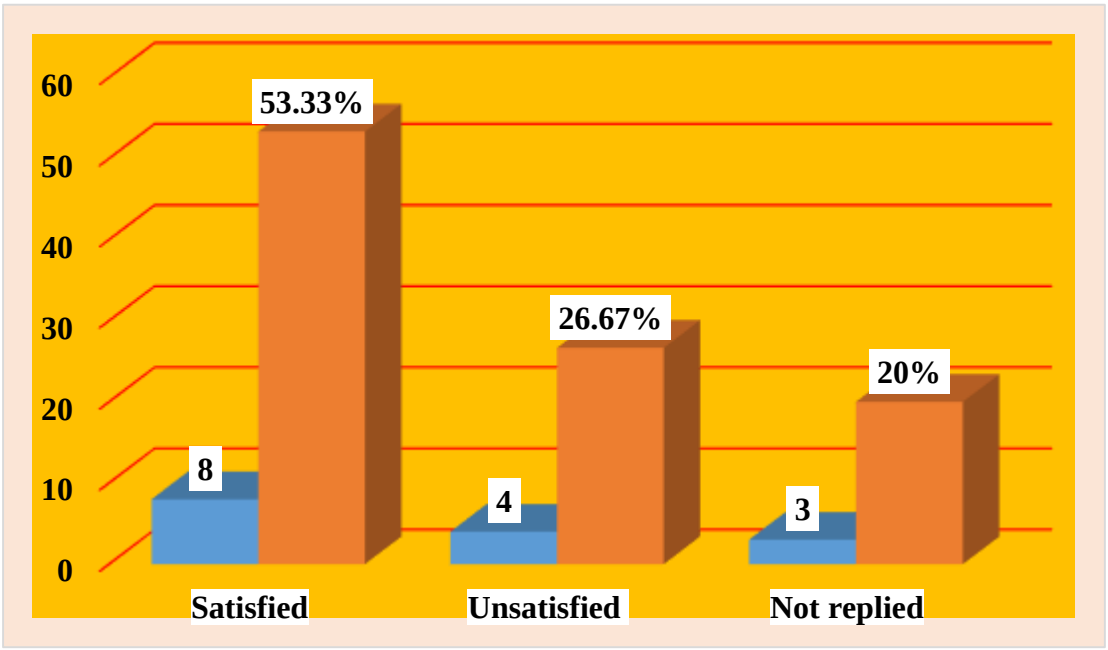


The respondents were asked whether the Annual Maintenance Contact (AMC) was being availed or not for proper functioning of the library software. The Table 4.2.33 and Figure 4.2.33 indicate that out of the 15 University Libraries 5 (33.33%) Libraries were having a Annual Maintenance Contact for the smooth functioning of the library software and 10 (66.67%) Libraries had not availed any type of Annual Maintenance Contact for the Library Software.

Table: 4.2.34: Satisfaction with Customer Support Services

S. No.	Customer support	No. of Libraries	Percentage
1.	Satisfied	8	53.33
2.	Unsatisfied	4	26.67
3.	Not replied	3	20
Total		**15**	**100%**

Figure: 4.2.34: Satisfaction with Customer Support Services



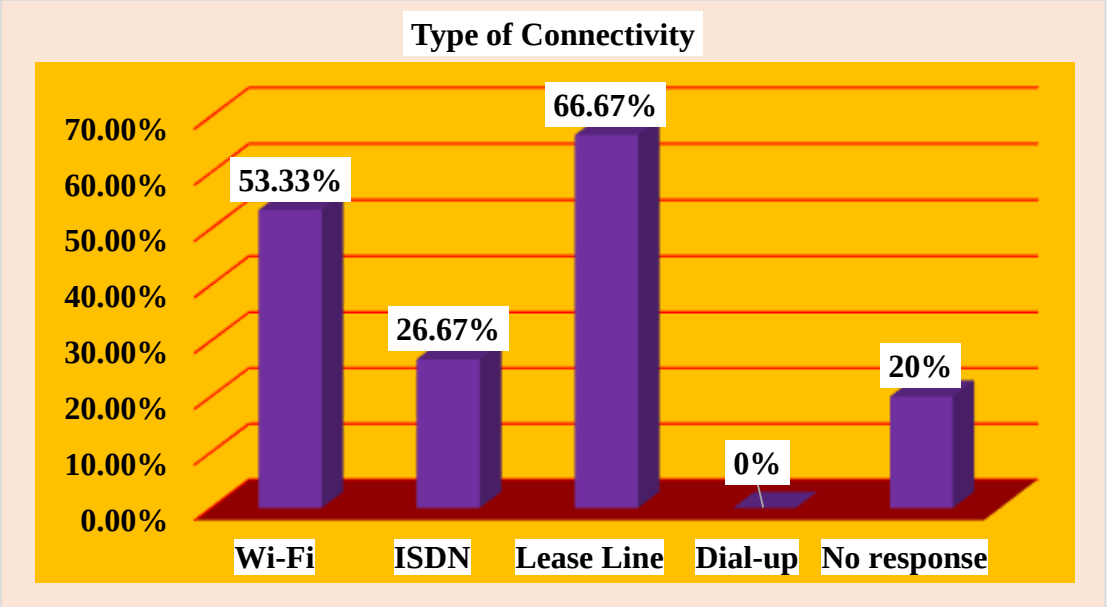
The respondents were asked to give their opinion in order to identify their satisfaction with Customer Support Services. The Table 4.2.34 and Figure 4.2.34 depict that a

majority of 8 (53.33%) respondents were satisfied with the valuable customer support services of vendors to resolve their hardware and software problems and 4 (26.67%) respondents were dissatisfied with the customer support services while; 3 (20%) of them did not respond due to non availability any type of library software. It is clear that a majority of the respondents are satisfied with the support services provided by vendors.

Table: 4.2.35: Internet Connectivity in Libraries

S. No.	Type of Connectivity	No. of Respondents	Percentage
1.	Wi-Fi	8	53.33%
2.	ISDN	4	26.67%
3.	Lease Line	10	66.67%
4.	Dial-up	0	0%
5.	No response	3	20%

Figure: 4.2.35: Internet Connectivity in Libraries



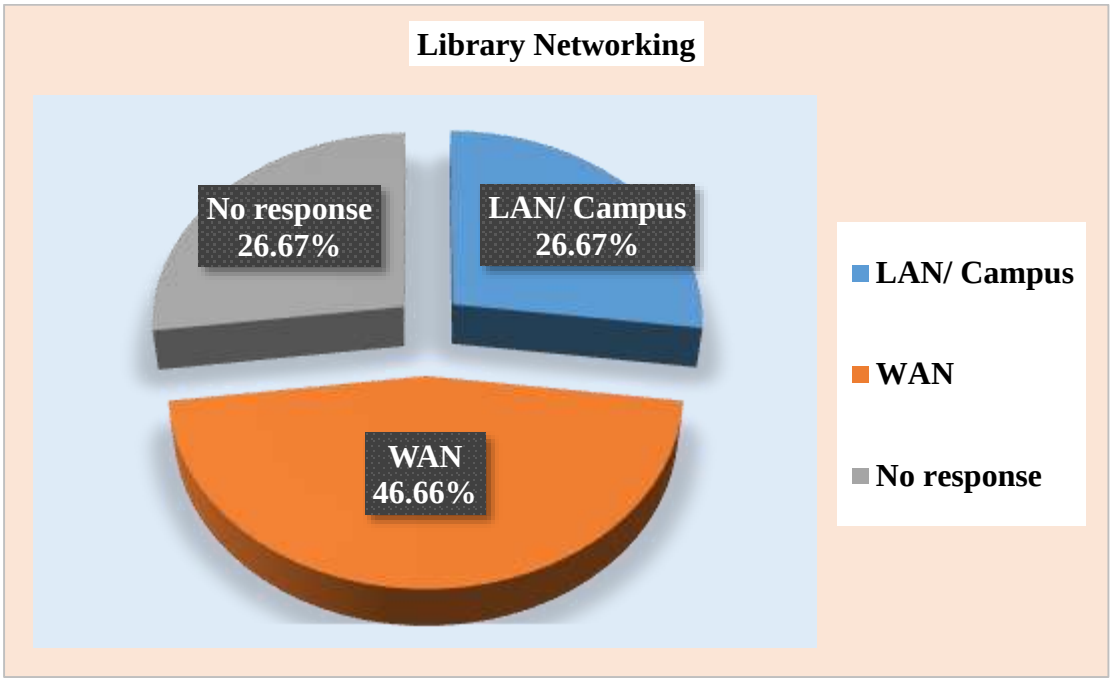
The respondents were asked to about the types of Internet connectivity in their libraries. The Table 4.2.35 and Figure 4.2.35 indicates that a majority of 10 (66.67%)

libraries are using Leased Line, followed by 8 (53.33%) libraries using Wi-Fi, 4 (26.67%) libraries using ISDN and 3 (20%) libraries did not respond. Therefore, it is clear that most of the respondents are using Lease Line for Internet connectivity.

Table: 4.2.36: Types of Library Networking

S. No.	Type of Networking	No. of Respondents	Percentage
1.	LAN/ Campus	4	26.67%
2.	WAN	7	46.66%
3.	No response	4	26.67%
4.	**Total**	**15**	**100%**

Figure: 4.2.36: Types of Library Networking

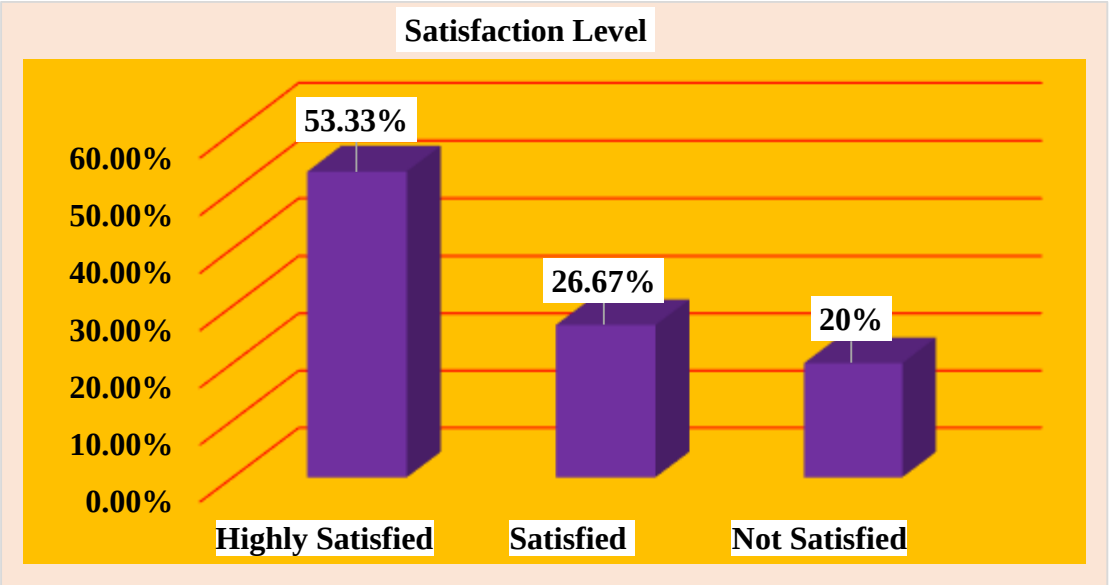


The respondents were asked to mention the types of library networking used in the University Libraries. The Table 4.2.36 and Figure 4.2.36 shows that 7 (46.66%) libraries are connected through WAN, 4 (26.67%) of the libraries are connected through LAN/Campus Connectivity and 4 (26.67%) libraries did not provide any response.

Table: 4.2.37: Satisfaction Level of Library Staff

S.No.	Category	Highly Satisfied	Satisfied	Not Satisfied	Total
1.	Automated Library Staff	8	4	0	12 (80%)
2.	Traditional Library Staff	0	0	3	3 (20%)
Total		**8 (53.33%)**	**4 (26.67%)**	**3 (20%)**	**15 (100%)**

Figure: 4.2.37: Satisfaction Level of Library Staff



The respondents were asked whether the staff of Automated Libraries were highly satisfied as compared to the library staff of non-automated libraries. The Table 4.2.37 and Figure 4.2.37 exhibits that a majority of 8 (53.33%) libraries responded that the staff was “highly satisfied” 4 (26.67%) libraries responded “satisfied” only, whereas 3 (20%) libraries responded “not satisfied” due to non-availability of automation. A majority of the University Libraries agreed that automation has a positive impact to increase the satisfaction level of the library staff.

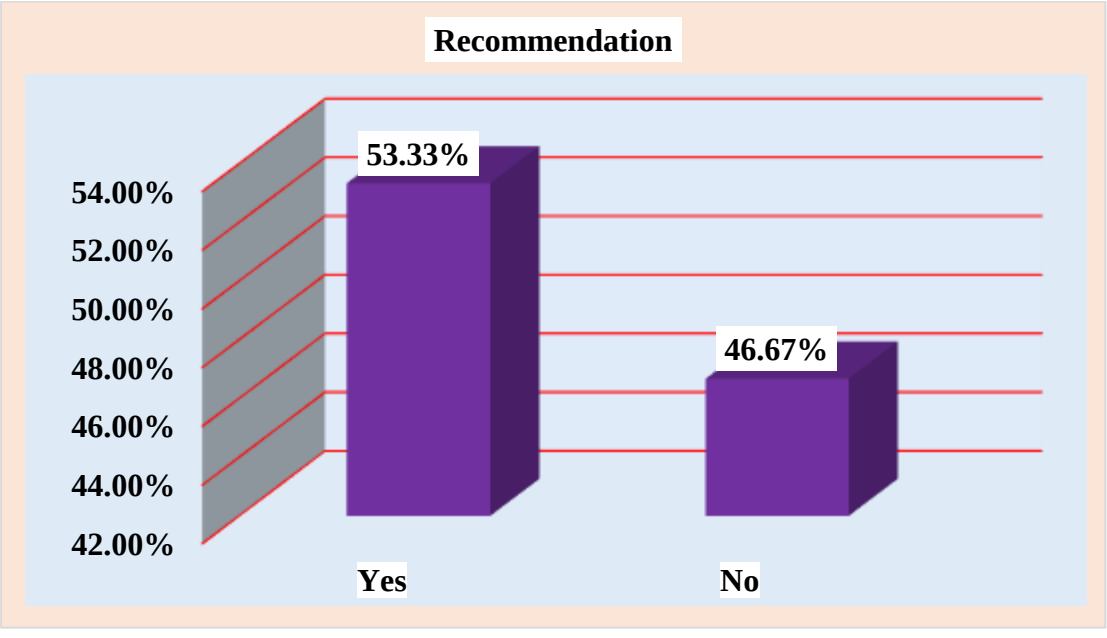
H4: "Staff of Automated Libraries are highly satisfied compare to non-automated libraries staff"

The Table 4.2.37 indicates hypothesis result about the satisfaction of library professionals working in automated libraries and non-automated libraries in Central University Libraries of North India. The result of hypothesis shows that a majority of 12 (80%) staff working in the automated libraries are highly satisfied as compared to 3 (20%) non-automated libraries staff. On the basis of the result, it can be conclude that most of the library professionals working in automated libraries are highly satisfied. Thus the hypothesis has been proved and accepted.

Table: 4.2.38: Librarians Recommendation of Software for other Libraries

S. No.	Response in Y/N	No. of Libraries	Percentage
1.	Yes	8	53.33%
2.	No	7	46.67%
Total		**15**	**100%**

Figure: 4.2.38: Librarians Recommendation of Software for other Libraries



It was necessary to know the views of the librarians about the recommendation of library software package for other libraries on the basis of their own experience. The Table 4.2.38 and Figure 4.2.38 exhibits that a majority of 8 (53.33%) respondents agreed and recommend software for automation to other libraries, which is presently being used in their libraries and 7 (46.67%) respondents are not in favour. The result clearly indicates that a majority of respondents are quite satisfied with the performance of software in their libraries and were in favour of recommending other libraries for automation.

4.3 Suggestions and Future Plan recommended by the Librarians

The suggestions and future plan have been given by the librarian regarding the Application and use of Library Software. These are as follows:

- **Automation Enables Various Services**: Librarians of the surveyed University Libraries suggested that library automation should be allowed to implement various types of services in the library, such as, circulation, cataloging, routine library work, creation of statistical reports, serial control, OPAC facility, indexing and abstracting services for improving library services for their users.
- **Multiple Advantages of Automation**: There are multiple advantages of automation in library tasks and services.
- **Require RFID Technology**: Installation of RFID technology should be made a necessity component of automation and digitization purposes.
- **Require Self-Circulation**: To implement self-circulation
- **Require Training to Library Staff**: Upgrade skills of the library staff through state-of-the-art current training programs at regular intervals.

- **Require Institutional Repository**: Formation of institutional repository amongst various libraries.
- **Require Resources Sharing**: Sharing of resources through library networking is an immediate requirement.
- **Require CCTV Camera:** CCTV Cameras are required in the library for effective security systems to avoid pilferage of valuable resources and reference material.
- **Require Digitization of Resources**: Digitization of resources must be given a highly priority.

Chapter-5

Findings, Conclusion and Suggestions

Chapter- 5

Findings, Conclusion and Suggestions

This chapter concludes suggestions and recommendations on the basis of the analysis of data. It also includes recommendations and futuristic plans given by the University Librarians for further research in context of utilization of varied library software packages in Central Universities.

5.1 Introduction

Over the last few decades, we have witnessed fabulous changes around the world particularly in the field of information technology which has affected every walk of human life as well as in the modern libraries. Information technology has made it possible to operate a large variety of tasks with much more ease, effectively and efficiently involving minimum efforts. In the age of information technology, most of the libraries are utilizing the latest information technology to improve its services and the work culture with more effectiveness and in a more efficient manner.

The study presents a realistic picture towards the use and application of a plethora of library software in Central University Libraries in North India. The main objective of the study is to provide certain significant ideas and guidelines to the University Librarians, which may prove to be helpful for the selection, application and implementation of appropriate library software packages for Library Automation and Content Management Process on the basis of the findings.

5.2 Summary of Findings

The study reveals that most of the Central University Libraries in North India are engaged in the utilization of library software packages to complete their routine work and the use of such technologies help them to perform their work effectively and with efficacy apart from the fulfillment of the maximum utilization of the available library resources and users' information requirements. The researcher has drawn the following specific findings of the study on the basis of data analyzed and interpreted:

- **Establishment of Central Universities in North India:** It is found that 5 (33.33%) Central Universities have been established in North India till 1947 and 4 (26.67%) during the period of 1948 to 2008 and a majority of 6 (40%) Central Universities were established during the period of 2009 to 2014 out of the 15 Universities. Therefore, the results indicate that there has been a dawdling growth for establishing a new University by the Government of India in North India.
- **Libraries Working Hours:** It is found that with regard to the reading room facility and circulation, a majority of the libraries 13 (86.67%), 11 (73.33%) are opening for 7 to 12 hours in a day respectively and just 2 (13%) of libraries have opened their reading rooms between 19- 24 hours. Therefore, the result clearly indicates that a majority of the University Libraries open for only 12 hours in a day.
- **Users Category in Central University Libraries:** It is noticed that all the Universities are offering Research Courses and Post Graduate courses whereas; 6 (40%) of the Universities do not offer Under Graduate courses.

- **Collection of Central University Libraries:** It is observed that a majority of the University Libraries do not have all types of resources while only a few libraries, such as, AMU and DU have a vast collection of all types of resources.
- **Strengths of Library Personnel:** It is amply clear that the largest number of library professionals are working in the Universities located in the Uttar Pradesh Region, such as, BHU and AMU whereas other newly established Central University Libraries are facing an acute shortage of library professionals.
- **Qualification of Librarian:** The results found out that a majority of 11 (73.33%) librarians are highly qualified and having Ph. D. degree and 3 (20%) of the librarians have acquired only a Post Graduate degree (MLIS) in Library and Information Science.
- **Library Budget for the Year 2013- 2014:** It has also been observed that the highest budget allocated was in the range of Rs. 12.00 to Rs. 13 Crores; 1 (6.67%) University Library for the library resources and majority of 5 (33.33%) University Libraries was allotted the lowest range Rs. 0 to Rs. 1.00Crores. The HNBGU library does not provide the financial data or any detail about the expenditure on library resources.
- **Special Grants for Library Automation and Digitization:** It is found that majority of 9 (60%) University Libraries are not receiving special grants from the UGC or any other agency and just 6 (40%) University Libraries are receiving special grants from UGC and some other sources. To provide better library services, UGC and other supported agency should take initiative for the special

grants for implementation of automation as well as digitization processes in the Central University Libraries.

- **Availability of Electronic Gadgets and Equipment in Libraries:** The results clearly indicated that among the University Libraries, JNU library has a rich collection (1518) of electronic gadgets and equipment followed by BHU 432, DU 412, IGNOU 327, AU 186 and JMI 143 respectively. While more than 50% of the University Libraries have less than 100 electronic gadgets and equipment to operate their varied day to day activities.
- **Operating Systems Used by the University Libraries:** It is observed that a majority of 12 (80%) of University Libraries have been using Windows7 Operating Software and 1 (6.677%) using Ubuntu. Therefore, it is clear that a majority of University Libraries have been using Windows7 Operating System.
- **Automation Software Used in the Libraries:** It is observed that a majority of 5 (33.33%) University Libraries are using Libsys software package and 6 (40%) University Libraries are using various types of library software for automation of their libraries.
- **Software Used for Library Digitization:** The result of the study clearly indicates that a majority of 11 (73.33%) University Libraries have not as yet implemented digitization software to develop their information resources into digital format and only 4 (26.67%) libraries are using software for digitization.
- **Automation in the University Libraries:** It also is observed that 12 (80%) of the University Libraries are automated out of 15 University Libraries and just 3

(20%) University Libraries are not automated. Therefore, it is absolutely clear that a majority of these University Libraries has been automated.

- **Present Status of Library Automation in University Libraries:** It is also noticed that a majority of 5 (33.33%) of University Libraries are fully automated, 4 (26.67%) found partially automated, 3 (20%) libraries are under the process of automation and 3 (20%) of University Libraries are not automated.
- **Phase-wise Development of Automation Process:** The result indicates that a majority of 5 (33.33%) University Libraries have been automated in the fourth phase (2011- 2014) and very few 1 (6.67%) library automated in the third Phase (2006-2010).
- **Time Consumed in Retrospective Conversion:** It is observed that a majority of 4 (26.67%) University Libraries have completed their automation work between "one to two years" along with some "more than four years" and just 2 (13.33%) University Libraries have been completed their automation work in "less than 1 year".
- **Automated Activities in the University Libraries:** It is observed that a majority of the University Libraries 12 (100%) are using the cataloguing module and merely 5 (41.67%) are using software for Financial Management for generation of reports.
- **Automated Services provided by the University Libraries:** It is observed that out of 15 University Libraries 11 (91.67%) Libraries are providing OPAC servicesand only 1 (8.33%) Library is providing SMS alert services to the users.

- **Library Software Enables Improvement of Library Services:** It is observed that a majority of 11 (73.33%) respondents preferred "to great extent" where they believe that automation process enables improvement of library services and merely 1 (6.67%) respondents preferred "to some extent".
- **Reasons for Non-automation:** It is observed that a majority of 3 (20%) University Libraries have indicated the reason due to "lack of library staff", and 1 (6.67%) library indicated the reason to "any other". Therefore, it is clear that lack of skilled staff emerged as one of the main reasons that are responsible for non-automation in the libraries.
- **Availability of Skilled Library Staff:** It is observed that a majority of 11 (73.33%) libraries indicate inadequate skilled staff as the major problem affecting the application of library software and just 4 (26.67%) libraries indicate that they have adequate skilled staff. For this reason, a majority of the libraries are surviving due to lack of skilled staff.
- **Standard Formats Supports by the Library Software:** The result indicates that a majority of 9 (60%) University Libraries Software's are supporting MARC standard format, 5 (33.33%) supporting UNIMARC, 4 (26.67%) supporting CCF and only 1 (6.67%) supporting any other standard format in their automation process.
- **Status of Library Digitization:** It is clear that a majority of 7 (46.67%) of the University Libraries are not digitized, 4 (26.67%) libraries are in the initial stages, 3 (20%) libraries are in the mid stage and in progress and just 1 (6.67%) library

has completed digitization. Therefore, the Central University libraries must be digitized to cope with the ever changing ICT environment.

- **Use and Compatibility of Library Software:** The result of the responses found that a majority 12 (80%) of libraries indicate that their automation software provide facility, such as, Multi-user access facility, Facility to share bibliographic records, Access to database through internet, Statistical facilities in the software and 9 (60%) libraries indicate that automation software compatible and provide access to the Standard Z39.50.
- **Performance of Library Software:** It is clear that a majority of the University Libraries through the performance of library automation software is quite good. Furthermore, the status of the digitization process is not good.
- **Selection Criteria for Library Software:** It is observed that a majority of 11 (73.33%) University Libraries have selected the library software on the basis of software features, 8 (53.33%) selected on the basis of users' needs, 5 (33.33%), 2 (13.33%) selected the library software on the basis of any other criteria and just 1(6.67%) on the basis of Users' Recommendation.
- **Evaluation Criteria for Library Software:** It is observed that amajority of 9 (60%) of the University Libraries have considered "customization" as a much preferred selection criteria, 8 (53.33%) libraries considered "software used by other Central University Libraries", "compatible for networking" and RFID compatibility, 7 (46.67%) considered User Training provided by the software

developing agency along with Unicode Compatibility and just 6 (40%) libraries considered "Compatible for resource sharing" as a selection criteria.

- **User feedback facility for Library Software:** It is observed that a majority 8 (53.33%) of the University Libraries are collecting the user's feedback and the remaining 7 (47.67%) of University Libraries having no provision for collecting user's feedback facility on this particular aspect.
- **Significance and Benefits of Library Software:** It is observed that a majority of 15 (100%) respondents have much preferred benefits to 'save the time of users, 14 (93.33%) preferred 'reduction of paper work', 13 (86.67%) preferred to 'archiving and preservation along with 24x7 availability and multi-user access facility', 10 (66.67%) preferred to resources management, 5 (33.33%) preferred to 'no more extension of building is required' and just 1 (6.67%) preferred to "reduce theft or misplacing of documents".
- **Barriers Faced During Library Automation:** It is observed that a majority of 11 (73.33%) respondents indicate Non-availability of Trained IT Staff, 5 (33.33%) indicate about Insufficient Funds along with Power Backup and Lack of Resources, 3 (20%) indicates Low Priority of Librarians and just 2 (13.33%) indicate Other Barriers. Therefore "Non-availability of Trained IT staff" has been emerged as a major barrier during the library automation process.
- **Access Facility of Library Catalogue through the Webpage:** It is observed that 9 (60%) libraries provide catalogue access facility through the webpage to the

users and 6 (40%) libraries do not provide catalogue accessible facility linked through the webpage.

- **Problems Faced in Library Routine Work in Different Modules:** The result clearly indicates that a majority of 5 (41.67%) respondents are facing problems in Serial Control Module, 4 (33.33%) are facing the problem in Gap in Service and Loss of Data along with Problems in the Acquisition System and Other Problems, 3 (25%) are facing Problems in the Circulation system, 2 (16.67%) are facing problems in Retrieval of Data: OPAC/web OPAC and just 1 (8.33%) library is facing problems in Cataloguing.
- **Staff Allowed to Attending Training Programs for Library Software:** It is observed that 13 (86.67%) libraries are allowed their library staff to attend the training programs related to library software and the remaining 2 (13%) libraries are not allowed to attend training program.
- **Annual Maintenance Contact (AMC) for Library Software:** It is observed that a majority of 10 (66.67) libraries do not have Annual Maintenance Contract and just 5 (33.33%) University Libraries have Annual Maintenance Contact for Library Software.
- **Satisfaction with Customer Support Services:** It is also observed that a majority of 8 (53.33%) respondents are satisfied that vendors provide better customer support services to resolve the problems and 7 (46%) respondents are found to be dissatisfied with customer support services.

- **Internet Connectivity in the Libraries:** It is observed that the majority of 10 (66.67%) respondents indicate that they are using Leased Lines, 8 (53.33%) of the libraries are using Wi-Fi, 4 (26.67%) libraries are using ISDN and 3 (20%) libraries are not responding about the internet connectivity.
- **Types of Library Networking:** The result also indicates that a majority of 7(46.66%) libraries are connected through WAN, 4 (26.67%) of the libraries are connected through LAN/Campus Connectivity and 4 (26.67%) libraries are not responding.
- **Satisfaction Level of Library Staff:** It is also observed that the majority of 8 (53.33%) University library staff of automated libraries are found to be highly satisfied, 4 (26.67%) have been found to be satisfied and 3 (20%) in the traditional working environment, library staff are not satisfied. Hence, the results indicate that University Libraries agreed that automation has a positive impact to increase the satisfaction level of library staff.
- **Librarians Recommendation of Software for other Libraries:** It is observed that 8 (53.33%) respondents agreed and recommend software for automation to other libraries, which is presently being used in their libraries and 7 (46.67%) respondents are not in favor.

5.3 Result of Hypotheses testing

On the basis of the findings of the study, the hypotheses formulated are as follows:

H: 1- Automation Process is Very Slow in the Libraries under Study.

Out of 15 University Libraries, only 5 (33.33%) Libraries are fully automated, 4 (26.67%) are found to be partially automated, 3 (20%) libraries are under progress and 3 (20%) University Libraries are not automated. **(Table- 4.2.13)**

It has been observed that the highest majority of the University Libraries completed their automation process in only one phase which is in the fourth phase (2011-2014) although the remaining phase of the development indicates a very slow and sluggish development of the automation process. **(Table- 4.2.14)**

Therefore, hypothesis has been proved and accepted.

H: 2- Library Software Fulfill Various Requirements of the Libraries.

The table 4.2.16 and 4.2.17 indicate the hypothesis results by applying single table Chi-square formula on the activities and services providing through Library Software. The result found that the Chi-Square calculated value is smaller than Chi-square critical (table) value. The result of hypothesis testing shows there is no significant difference in the opinion about required activities and services provided through Library Software. It is clear that Library Software fulfills various requirements of the libraries.

Therefore, above stated hypothesis has been proved and accepted.

H: 3- Application of Library software helps to great extent in the improvement of services provided by the Libraries.

The Table 4.2.18 indicates hypothesis result about Library Software that it helps to great extent in the improvement of services. The result of hypothesis testing shows that most of the respondents firmly believed in the statement that library

software helps to a great extent in the improvement of services provided by the libraries.

Thus, the above stated hypothesis has been proved and accepted.

H: 4- Staff of Automated Libraries are Highly Satisfied as Compared to Non-automated Libraries Staff.

The Table 4.2.37 indicates hypothesis result about the satisfaction of library professionals working in automated libraries and non-automated libraries in Central University Libraries of North India. The result of hypothesis shows that a majority of 12 (80%) staff working in the automated libraries are highly satisfied as compared to 3 (20%) non-automated libraries staff. On the basis of the result, it can be conclude that most of the library professionals working in automated libraries are highly satisfied.

Thus, the hypothesis has been proved and accepted.

5.4 Conclusion

The present study concludes that technology has improved and will perhaps continue to have a dramatic impact on library in house-keeping operations and services.

The study concludes that out of 15 libraries, 12 (80%) libraries are automated and 3 (20%) libraries are not automated. In order to identify the extent of the library automation the librarians were asked to specify the extent of automation; 5 (33.33%) libraries are fully automated, 4 (26.67%) libraries partially automated, 3 (20%) libraries are in the initial stages of automation.

Respectively, 4 (27%) University Libraries are digitized and 11 (73%) University Libraries are not digitized. In order to identify the extent of the library digitization the librarians were asked to specify the extent of digitization; 3 (20%) University Libraries are in the middle of the automation process and 1 (7%) University Library is fully digitized. Thus, the study concludes that status of the surveyed University Libraries towards utilization of software is not satisfactory.

The study concludes that maximum University Libraries are using Proprietary Software for Automation. It is observed that 5 libraries use Libsys software, 2 libraries use SOUL software, 1 library use E-granthalaya software, 1library use SLIM++ software, 1 library use Troodon 4.0software, 1 library use Virtua software and 1library use KOHA software. It also concludes that most of the libraries are using Open Source for Digitization due to its features. It is observed that 3 libraries use D-space and 1 use Tech Focus.

It is concludes that libraries of Central Universities had implemented software packages to complete in-house operations and services. However, the status is that activities and services like self-check in/out, complete Serials Management, web OPAC, SMS alert, installation of RFID are yet to be completed in the University Libraries under investigation. On the other hand, status of some University Libraries such as JNU, DU, IGNOU and JMI are found to be satisfactory.

At present, a large number of University Libraries are involved in implementing software packages to operate various library tasks and services. However, the staff of the libraries, due to insufficient and inadequate knowledge cannot operate appropriately.

Therefore, there is an imperative requirement for more studies for technological changes and improvements in University Libraries. It is also essential for the Librarians and University authorities that they implement effective and successful automated library systems in order to maximize utilization of information resources as well as also for the satisfaction of the users' community.

5.5 Suggestions

On the basis of analysis and findings of the study and suggestions are given by the respondents. These are major suggestions as follows:

- It is suggested that the University Libraries, which are well-equipped and automated can contribute to a great extent in educational and research activities effectively, while others cannot play a vital role in academic and research activities. Therefore, in order to surmount this problem, librarians should take the initiative.
- The processes of automation and digitization have not yet been completed in all the University Libraries of North India, while the Central Universities play a vital role in research and development. Hence, all the University Libraries should consider it a necessity to automate and digitize the library resources.
- The manual process in the library had become monotonous while on the other hand the automated environment has improved the job satisfaction levels of the library staff due to its variety of work and time saving. Therefore, all libraries should take an initiative towards automation and digitization to accomplish the

objectives of the organization and to be able to provide a superior and optimum quality of library services.

- As acquisition modules play a vital role in library; and are used for the purpose of collection development, preparation and updating vendors/suppliers lists, issuing reminders, budget management, etc. It has been observed that around 50% of the University Libraries were toying with this particular module. Hence, librarians are required to take the initiative to operate this module.
- Various tasks and related activities of acquisition module can be automated through Library Software packages. Through this process, the basic activities are linked with the files of vendors, publishers, suppliers, budget and currency of accounting. It facilitates achieving the benefits of an integrated Library Management Software.
- The selection of software should be unique and keeping in view the present requirement as well as the future prospects of the library.
- At the time of selection of library software, user friendliness should be the top most priority.
- Training programs should be provided to the library staff on the use of Library Software packages.
- As mentioned earlier that some of the University Libraries have not as yet implemented their automation project. To improve the status of library and its services, libraries require automation environment.

- University libraries, such as, JNU, DU, JMI, IGNOU, BHU, AMU are providing sufficient OPAC terminals to its users and the remaining other surveyed libraries are in urgent need more number of OPAC terminals.
- Among the surveyed libraries, a few libraries are providing specialized library services. So it is suggested that all the University Libraries should provide services like CAS, SDI, and alert services.
- Only a few University Libraries like; Aligarh Muslim University, Jamia Millia Islamia, Jawaharlal Nehru University are members of OCLC. It is suggested that the remaining University Libraries should also become members of OCLC.
- To operate library tasks and services, requisite training related to library software must be imparted to the library staff in order that better services can be provided to the users.
- All the automated Libraries excluding libraries of University of Allahabad, Central University of Himachal and Central University of Jammu are using Serial Control Module in automation software. Therefore, it is suggested that the library staff should undergo through the requisite training to operate the module.
- An objective of networking system involves resources sharing by providing individual libraries access to the catalogue, information resources of other libraries. Therefore libraries should contribute to networking in order to overcome the problem of rising costs of information resources that will also stand to benefit libraries having insufficient budget.

- It is also suggested that University Libraries require trained manpower. To improve its status, recruitments should be done keeping in view the capability of personnel towards automation and digitization activities.
- Librarians should design a web page of the library, which should provide information regarding information resources, available databases and specialized library services.
- Library automation allows various types of library services in the library for users.
- There are multiple advantages of automation.
- Library must be automated.
- Installation of RFID technology is necessary.
- Implement self-circulation in the library.
- Update library training of library staff.
- Immediate requirement of IT-trained library staff
- Formation of Institutional Repository
- Subscription of e-Books from various international suppliers
- Sharing of resources through library networking is mandatory.
- Convert the microform into a digital form.
- Digitalization process must be given top priority.
- CCTV Cameras are needed in the library.

5.6 Area for Further Research

The study is limited to the use and application of library software packages in Central University Libraries of North India. During the study, the researcher felt that the following topics may be carried out for further research to improve the utilization of library software packages:

- Utilization of Library Software packages in the State/ Central University Libraries.
- Use and Application of Library Software packages in the Selected University Libraries in SAARC Countries: A comparative study.
- Assessment of Library Software packages in University Libraries at State/ India level.
- A comparative study on the use and application of software among University Libraries: newly established Central University Libraries or oldest Central University Libraries.

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Appendices

Dear Sir,

I am requesting your good self to kindly spare few minutes to fill up this questionnaire on the topic **"Application and Use of Library Software in Central University Libraries in North India: A Study"**. Sir all information/ data provided by you will remain confidential and shall be used for research purpose only.

I solicited your kind co-operation in this regard.

Thanks

Satish Kumar
Research Scholar,
DLIS, BBAU,
Lucknow

(i) Please tick mark [√] to indicate answers wherever mentioned.

(ii) If necessary, please attach a separate sheet for information on any of the items.

Questionnaire for Librarian

Topic: Application and Use of Library Software in Central University Libraries in North India: A Study

A. General Information

1. **Name of the Library** : _____
2. **Year of Establishment** : _____
3. **Name of the Librarian/In-charge** : _____
4. **Telephone/Mobile No.** : _____
5. **Email** : _____
6. **Library opening**
   - **a. Reading room** : _____
   - **b. Issue Return** : _____
   - **c. Any other (please specify)** : _____

7. **Total Members in Library** (numbers in year wise)

Sr. No.	Users	2011-12	2012-13	2013-14
(i)	Teaching Staff			
(ii)	Research Scholars			
(iii)	PG Students			
(iv)	UG Students			
(v)	Admin. Staff			
(vi)	Non-Teaching			
(vii)	Outsiders			
(viii)	Other			

8. Please provide details about the Collection of Library:

S. No.	Collection	Print Form in Numbers	Soft Form in Numbers		Total
			On-line	Off-line	
(i)	Books				
(ii)	Journals				
(iii)	Bound vol.				
(iv)	Rare Books				
(v)	Theses				
(vi)	Dissertations				
(vii)	Manuscripts				
(viii)	CD/DVDs				
(ix)	Video				
(x)	Newspapers				
(xi)	Standards				
(xii)	Other				

9. Please provide the details of Library Personnel:

S. No.	Category of Staff	In Numbers	Educational Qualification (optional)	Experience in Year
(i)	Librarian			
(ii)	Deputy Librarian			
(iii)	Ass. Librarian			
(iv)	Doc. and Inf. Officer			
(v)	Cataloguer			
(vi)	Professional Assistant			
(vii)	Semi Prof. Assistant			
(viii)	Library Assistant			
(ix)	Library Clerk			
(x)	Library Attendant			
(xi)	Book Lifter			
(xii)	Peon			
(xiii)	Other			

10. Please provide the details of Finance Management in Library:

S. No.	Resources	Budget for the Current Year
(i)	Books	
(ii)	Periodicals	
(iii)	Non Book Materials	
(iv)	Library Equipment	
(v)	Library Software	
(vi)	Computer Accessories	
(vii)	Other (please specify)	

11. Did you receive any special grants for Automation and Digitization of your Library?

Yes [ ] No [ ]

If yes, please specify the agency:

(i) UGC [ ] (iii) Central Govt. [ ]

(ii) State Govt. [ ] (iv) Any other [ ]

(v) Any other (Please specify)……..……..……..…..……...

12. Please provide details of Available Electronic gadgets and equipment's:

S. No.	Items	Numbers
(i)	Computer	
(ii)	Server	
(iii)	Clint workstation	
(iv)	Photocopy Machine	
(v)	Scanner	
(vi)	Barcode Scanner	
(vii)	Bar Code Printers	
(viii)	Laser Printer	
(ix)	Digital Camera	
(x)	LCD	
(xi)	Laptop	
(xii)	Projector	
(xiii)	CD/DVD Writer	
(xiv)	Storage Devices	
(xv)	UPS	
(xvi)	Other (please specify)	

13. Please provide the details of Available Software:

S. No.	Software in Use	Name	Version (Optional)
(i)	General Operating Software, (e.i. Windows, Linux, Unix)		
(ii)	Library Automation Software		
(iii)	Library Digitization Software		
(iv)	Antivirus Software		
(v)	Anti- Plagiarism Software		
(vi)	Other (please specify)		

B. Library Automation and Digitization

14. Whether your Library is Automated:

Yes [ ] No [ ]

If yes, please specify which of the following Housekeeping operations are automated:

S. No.	Housekeeping Operations	Automated	
		Yes	No
(i)	Acquisition		
(ii)	Cataloguing		
(iii)	Circulation		
(iv)	Serial Control		
(v)	OPAC		
(vi)	Web OPAC		
(vii)	Barcode Generation		
(viii)	Finance Management		
(ix)	Stock Verification		
(x)	Creation of Reports		
(xi)	Other (please specify)		

15. Does your Library Management Software provide following services?

Library Services	**Yes**	**No**
Current Awareness Services (CAS)		
Selective Dissemination of Inf. (SDI)		
Circulation		
SMS Alert		
Ask a Librarian		
OPAC		
Web OPAC		
Any other (please specify)		

16. Please specify the status of automation:

(i) Fully automated [ ] (iii) Initial Stage [ ]
(ii) Partially automated [ ] (iv) No response [ ]

17. If the Library is not automated, please specify the reasons:

(i) Inadequate Finance [ ] (iv) Cost of Software [ ]
(ii) Lack of infrastructure [ ] (v) Any other [ ]
(iii) Lack Skilled Staff [ ]

18. Availability of Skilled staff for Automation, Digitization and Networking:

(i) Adequate skilled staff [ ] (ii) Inadequate skilled staff [ ]

19. Please specify the phase wise Development of Automation Process:

(i) Before 2000 [ ] (iii) 2006 - 2010 [ ]
(ii) 2001- 2005 [ ] (iv) 2011 - 2014 [ ]

20. Please specify time consumed in Retrospective Conversion in your Library

(i) Less than 1 year [ ] (iii) 3 to 4 year [ ]
(ii) 1 to 2 year [ ] (iv) More than 4 year [ ]

21. Does your Software supports following standards for sharing the records?

(i) MARC [ ] (iii) CCF [ ]
(ii) UNIMARC [ ] (iv) Any other [ ]

22. Does your Library is in the process of Digitization?

(i) Yes [ ] (ii) No [ ]
If yes, please specify the status: Initial Stage [ ]
Middle in Process [ ] Completed [ ]

23. Please specify the staff involved in Library Automation and Digitization activities:

Designation	Yes	No	No. of Persons
University Librarian			
Deputy Librarian			
Assistant Librarian			
Computer specialist			
I/C Automation & Digitization			
Other professionals			

24. What criteria you have followed for selection of Library Software? (please specify)

(i) Users' Need [ ] (iv) Feature of Software [ ]
(ii) Cost Effectiveness [ ] (v) Users Recommendation [ ]
(iii) Library Committee [ ] (vi) Any other …….....

25. Have you followed the below mentioned factors for selecting Library Automation Software Package:

(i) User friendly [ ]
(ii) Customization [ ]
(iii) Software used by other central university libraries [ ]
(iv) Compatible for networking [ ]
(v) User training provided by software developing agency [ ]
(vi) Compatible for resource sharing [ ]
(vii) RFID Compatibility [ ]
(viii) Unicode Compatibility [ ]

C. Use and Significance of Library Software

26. Please specify the use and performance of your Library Software (Rate in scale from 1 to 5)

Library Software	Best (5)	Very good (4)	Good (3)	Fair (2)	Poor (1)
Automation					
Digitization					

27. Please specify, Use and Compatibility of Library Software:

(i) The software accommodates simultaneous multi-user access facility [ ]
(ii) The software allows various modules to share one bibliographic records [ ]
(iii) The software allows to access the database through internet [ ]
(iv) The software allows to the staff for the generation of statistics, reports and customization [ ]
(v) The software is compatible with the standard Z39.50 [ ]

28. Do you collect user feedback on the usage and performance of your Library Software?

(i) Yes [ ] (ii) No [ ]

29. In your opinion, what significance and benefits you find using Library Software?

(please specify):

(i) Reduce paper work [ ]
(ii) No more extension of building is required [ ]
(iii) Resources management is required [ ]
(iv) Archiving and preservation [ ]
(v) Save the time of users and Library staff [ ]
(vi) Reduce theft or misplace of documents [ ]
(vii) Availability of information for 24X7days [ ]
(viii) Multi user access facility [ ]
(ix) Other please specify……..…….……..…..

30. What are the barriers you faced during automation process?

(i) Insufficient fund [ ]
(ii) Non availability of trained IT Staff [ ]
(iii) Power backup [ ]
(iv) Lack of resources [ ]
(v) Low priority of authority [ ]
(vi) Other (please specify)……...…….

31. Does the library catalogue accessible through the webpage?

(i) Yes [ ] (ii) No [ ]
If yes please mention the address…….……...……..

32. Please indicate, the problem faced by you in different modules of your library software:

(i) Gap in service and loss of data [ ]
(ii) Problems in retrieval of data: OPAC/ web OPAC [ ]
(iii) Problems in acquisition system [ ]
(iv) Problems in Cataloguing [ ]
(v) Problems in Circulation System [ ]
(vi) Problems in Serial Control [ ]
(vii) Other Problems [ ]

33. Please indicate, to what extent, library software has improved the effectiveness of library services:

(i) To great extent [ ] (iii) No response [ ]
(ii) To some extent [ ]

34. Does your Library Staff allowed to attend any training program for Library Software?

(i) Yes [ ] (ii) No [ ]

35. Does your Library have Annual Maintenance Contract (AMC) for Library Software?

(i) Yes [ ] (ii) No [ ]
If yes please specify the year covered in AMC ……..……..…

36. Are you satisfy with the customer support services provided by library software

vendor:

(i) Yes [ ] (ii) No [ ]

37. What type of Internet Connectivity are you using for library tasks and services?

(i) Wi-Fi [ ] (iii) Lease Line [ ]

(ii) ISDN [ ] (iv) Dial-up [ ]

(v) Any other Please specify……..……...….

38. What type of Networking are you using for library:

(i) LAN [ ] (iii) No response [ ]

(ii) WAN [ ]

39. Do you think that your library staff satisfied with the automation?

(i) Highly Satisfy [ ] (iii) Not Satisfy [ ]

(ii) Satisfy [ ]

40. Have you recommended the software employed in your library to other University Libraries: (Please indicate):

(i) Yes [ ] (ii) No [ ]

41. Suggestion (if any).....
.....

42. Future Plan (please ecify).....
.....
.....

Date……..

Name……...……

Signature…….

Designation…….