

**OPEN SOURCE SOFTWARE FOR  
INTEGRATED LIBRARY SYSTEMS  
RELATIVE APPROPRIATENESS IN THE  
INDIAN CONTEXT**

Thesis Submitted to the Mahatma Gandhi University  
for the award of the degree of

**DOCTOR OF PHILOSOPHY**  
in

**Library and Information Science**  
by

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Mahatma Gandhi University, Kottayam, Kerala**

September 2016

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## DECLARATION

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(Gireesh Kumar T. K.)

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'In India Open Source Software  
will have to come and stay in a big way  
for the benefit of our billions of people'

*-Dr. A.P.J. Abdul Kalam*

## ACKNOWLEDGEMENT

I received immense support and inspiration from numerous sources I had approached in connection with my research work which I record here with a deep feeling of gratitude. I remember with deep gratitude my research supervisor Dr. R. Raman Nair, Centre for Advanced Research in Library and Information Science (CARLIS), Mahatma Gandhi University, Kottayam, Kerala whose valuable guidance and advice, inspiration, immense patience, constructive criticism and constant support at every stage helped me do this work to the best of my abilities.

I am very thankful to eminent professors like Prof. Marshal Breeding; Prof. B. Ramesha, Bangalore University; Dr. Badan Barman, KKOUS University and other professional friends from India and abroad for extending their valuable suggestions, advice and positive criticism on building a precise online questionnaire covering all aspects of the objectives of the study. I extend my sincere thanks to Centre for Advanced Research in Library and Information Science (CARLIS) and School of Social Science, Mahatma Gandhi University, Kottayam, Kerala for accommodating me to pursue my research work, National Science Library and other library professionals in the country and abroad for sharing their valuable resources related to the study.

I am grateful to Dr. G. Sundararajan, Director, ARCI and Prof. (Dr.) G. Gopakumar, Vice Chancellor, CUKerala for extending permission to pursue my research studies during my change of career and sincerely express my gratitude to the respective staff and faculties for their encouragement, facilities provided and support extended thorough out the work.

I express sincere gratitude to the present Director Dr. Raju and the previous Director Dr. Ram Mohan of School of Social Science, MG University, Kottayam and Dr. Sainul Abideen, Librarian, IISER Thiruvananthapuram for providing me advice and suggestions in choosing an appropriate and relevant area of research study. I also acknowledge Smt. Laila T. Abraham, University Librarian, Mahatma Gandhi University, providing me library facilities and online access to resources and support continuously during the period of my research. I wish to thank Sri. Vimal Kumar, Technical Assistant, MG University, for sharing his experiences and expertises on Koha software, which enabled me to build a



focus oriented questionnaire and also to get details of select libraries using Koha software in India. This acknowledgement will be incomplete without thanking my dear friend Sri. Muruli, Librarian of National Thermal Power Centre, Bengaluru for his constant motivation and he was always a source of inspiration throughout the study.

I am grateful to Dr. Egbert De Smet, Professor, University of Antwerp, Belgium who is associated with BIREME (WHO-Brazil) to develop ABCD Integrated Library System, for his remarkable suggestions and contributions. Also, thank Dr. Egbert and Mr. Suresh Ramachandran Nair for fine-tuning the contents of this research work. I take this opportunity to thank the Open Source Community who developed the versatile OSILS solutions for libraries which plays a major role in bridging the digital divide.

My sincere thanks to ICADL 2013 Doctoral Student Consortium participants, from India and abroad who have directly and indirectly helped me by suggesting constructive modifications on the contents of the questionnaire which enhanced the quality of the work. I express my sincere gratitude to the library professionals in the country who actively participated in the online survey which enabled the findings presented and also formulating recommendations. I thank all my professional friends and colleagues within India and abroad who helped me at various stages of the research work directly and indirectly.

I have no words to express my sincere gratitude to my wife Mrs. PraseethaGireesh, who was an immense source of support and motivation throughout the work which enabled me to complete the work in time. I thank my daughter Kumari Adithri for her presence and childish mischief which I took as encouragement for this academic endeavour and also for sparing my time which really was the time meant for attending her. I also thank my beloved Father (he is no more), Mother, Sisters, In-laws, and other family members for their constant support and inspiration.

Last but not least, I humbly bow my head and extend my deep sense of gratitude to God Almighty for providing me strength and courage throughout the period of study. Without His grace and blessings this work would not have been accomplished successfully.

Kasaragod  
07<sup>th</sup> September 2016

Gireesh Kumar T. K

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## LIST OF ABBREVIATIONS

No.	Acronym	Expansion
1.	AACR	Anglo American Cataloguing Rules
2.	ABCD	Automatisación de Bibliotecas y Centros de Documentación
3.	AfW	Alice for Windows
4.	ALS	Automated Library System
5.	AMC	Annual Maintenance Cost
6.	ANSI	American National Standards Institute
7.	CAS	Current Awareness Service
8.	CCF	Common Communication Format
9.	CD	Compact Disc
10.	CDS/ISIS	Computerized Documentation Service/Integrated Set of Information Systems
11.	COBOL	Common Business Oriented Language
12.	CSIR	Council of Scientific and Industrial Research
13.	DBMS	Database Management Systems
14.	DELNET	Developing Library Network
15.	DOS	Disk Operating System
16.	DRDO	Defense Research and Development organization
17.	DRTC	Documentation Research and Training Centre
18.	DVD	Digital Versatile Disc
19.	ERM	Electronic Resource Management
20.	FOSS	Free and Open Source Software

21.	FSF	Free Software Foundation
22.	GPL	General Public License
23.	GUI	Graphical User Interface
24.	ICT	Information and Communication Technology
25.	IEEE	Institute of Electrical and Electronics Engineers
26.	ILL	Inter Library Loan
27.	ILMS	Integrated Library Management Systems
28.	ILS	Integrated Library System
29.	INFLIBENT	Information and Library Networks
30.	INSDOC	Indian National Scientific Documentation Centre
31.	ISI	Indian Statistical Institute
32.	ISO	International Standards Organization
33.	IVRS	Interactive Voice Response System
34.	KIIKM	Kesavan Institute of Information and Knowledge Management
35.	LAMP	Linux, Apache, MySQL, PHP
36.	LAN	Local Area Network
37.	LIS	Library and Information Science
38.	LMS	Library Management System
39.	MARC	Machine Readable Catalogue
40.	MIS	Management Information System
41.	NewGenLib	New Generation Library
42.	NGL	NewGenLib
43.	NISCAIR	National Institute of Science Communication and Information Resources

44.	OAI-PMH	Open Access Initiative-Protocol for Metadata Harvesting
45.	OASIS	Advancing Open Standards for the Information Society
46.	OCLC	Online Computer Library Centre
47.	OPAC	Online Public Access Catalogue
48.	OPALS	Open Source Library Automation System
49.	OpenSRF	Open Scalable Request Framework
50.	OS	Open Source
51.	OSD	Open Source Definitions
52.	OSI	Open Source Initiative
53.	OSILS	Open Source Integrated Library System
54.	OSS	Open Source Software
55.	PINES	Public Information Network for Electronic Services
56.	PHP	Hypertext Preprocessor
57.	PMB	PhpMyBibli
58.	RDBMS	Relational Database Management System
59.	RFID	Radio Frequency Identifiers
60.	RFP	Request for Proposal
61.	SDI	Selective Dissemination Service
62.	SOUL	Software for University Libraries
63.	UGC	University Grants Commission
64.	UILOSS	University of Isfahan Libraries Open Source Software
65.	UKMARC	United Kingdom Machine Readable Catalogue
66.	UNIMARC	UNiversal MACHine Readable Catalogue
67.	URL	Uniform Resource Locator

- 68. USMARC      United States Machine Readable Catalogue
- 69. VTLS        Virginia Tech Library System
- 70. XML         Extensible Markup Language
- 71. WAN         Wide Area Network
- 72.    WWW       World Wide Web

# Chapter 1

## INTRODUCTION

### **1.1. Background**

Advent of computer technologies and developments in Information and Communication Technologies (ICT) have had a tremendous impact on library and information centers which resulted in developing promising changes in the way in which information is collected, stored, retrieved and broadcasted. Creation, collection, preservation, organization and dissemination of information is now crucial in all spheres of human activity to ensure quality, speed and sustainable development. ICT gives powers hitherto undreamed off for knowledge management especially through the Internet, bibliographic database management systems and digital archiving solutions, which enables pooling the world's knowledge resources in different media and retrieval of specific data from anywhere, in any format within seconds. Libraries and information centres have been responsible for this intellectual task of content management and digital archives since ages. But the formats and media in which they managed resources changed from space in cave walls to cloud. Today's libraries are faced with the challenges of integrating traditional and emerging formats, balancing resource allocation between traditional and upcoming technologies and building new information management processes and procedures (Trainor, 2009). The ever-changing demands of users for more efficient, effective and specialized services within no time at their desired locations have now elevated the role of library professionals from custodians of resources or service providers to knowledge managers.

In order to keep pace with the changing needs and expectations of users, library professionals now have to provide more sophisticated, quicker and user-friendly services using different advanced, adaptable and easily configurable technologies over network,



especially over the web. Users increasingly expect instant access to the required information, at their location through a basic device they possess. Library professionals are being renamed as 'information facilitator' rather than 'information provider' in this networked information landscape where they have to work beyond their usual roles. Libraries are in the midst of technological restructuring, and are required to act as guide to information, and are responsible for bringing innovative ideas to better serve their users. However, most of the Indian libraries still follow traditional methods and are unable to provide quality services through networked environment due to inadequacy of funds, shortage of ICT skilled work force, lack of awareness on ICT enabled technologies, lack of knowledge in recognizing appropriate solutions etc.

## **1.2. Library Automation**

Many years ago, before introduction of computer technologies, libraries were following different kinds of manual methods such as card catalogue, typewriters, registers, punch card catalogue, etc to manage the collections of a library and to provide the user services. The scenario has completely changed by the advent of computers. Subsequently libraries started using computers to perform select activities that had restructured its functions. The word "automation" has been derived from Greek word "automose" means something, which has power of spontaneous motion or self-movement. D.S. Harder first introduced the term automation in 1936, who was then with General Motor Company in the U.S. He used the term automation to mean automatic handling of parts between progressive production processes (Wikipedia, 2016). Automation is a general term used to indicate the application of computers and Internet to replace the manual systems and thereof to make the library housekeeping process efficient and error free. Library Automation is the process in which information technologies and computer technologies are used to perform daily work of libraries, which was earlier done manually by human beings. Library automation can also be defined as the application of ICTs to enhance the operational and service efficiency of the library and to reduce the repetitive and clerical works of staff and thereby replace the manual systems. Automation enhances the activities of a library so as to make it easy for prompt service delivery to the users. The functions that may be automated are any or all of the items including acquisition, cataloguing, public access (OPAC and

WebOPAC), indexing and abstracting, circulation, serials management, and reference (UNESCO, 2006). There are various sorts of information services like e-discovery etc. that can also be automated.

Application of computers to perform the essential routines and operations of a library in a systemized way is one of the basic and quality services requirements that need to be achieved in the initial stage of development. Various techniques for information handling have been developed considerably during the last few decades. Library professionals need to use these technologies for information handling and should have the ability to use information technologies to communicate effectively with their patrons. It is not an uncommon phenomenon in Indian libraries that they make plans to automate their activities and services, but drop the plan midway due to certain reasons and the reasons may vary according to the libraries and library professionals. The experience of Egunjobi and Awoyemi on their automation process revealed that a successful library automation project requires adequate finances, constant power supply, infrastructure, experienced IT professionals in software installation, dedicated staff, and proper training of all library staff (Egunjobi and Awoyemi, 2012). In addition, there should be a dedicated team of library staff with adequate literacy in computer applications that will maintain regular and constructive communication with ICT professionals involved. For the successful implementation of an ILS all key factors must be in place: support from administration, staff competence, consideration of user requirements, availability of infrastructure (hardware, software, networks), available data, and excellent managerial skill from the coordinator of the project (Shivaram, 2007). Automation of libraries also requires adequate planning as well as continuous support from technical staff to utilize computers and related technologies efficiently apart from the availability of sufficient amount of quality hardware, software and other associated peripherals. However, the advent of various technologies and their availability in the public domain free of cost makes library automation cheap, fast and more effective than ever.

### **1.2.1. Definitions of Library Automation**

According to the definition given by Encyclopedia of Library and Information Sciences, "Library Automation is the use of automatic and semiautomatic data processing

machines to perform such traditional library activities as acquisitions, cataloguing, and circulation. These activities are not necessarily performed in traditional ways, the activities themselves are those traditionally associated with libraries; library automation may thus be distinguished from related fields such as information retrieval, automatic indexing and abstracting and automatic textual analysis". Also, "automation is the technology concerned with the design and development of process and system that minimize the necessity of human intervention in operation" (Kent, 1977).

McGraw Hill Encyclopedia of Science and Technology defines automation as "a coined word having no precise generally accepted technical meaning but widely used to imply the concept, development, or use of highly automatic machinery or control systems". (McGraw, 1982)

According to ALA Glossary of Library and Information Science, library automation is defined as "the performance of an operation, a series of operations or a process by self-activating, self-controlling, or automatic means. Automation implies the use of automatic data processing equipment such as a computer or other labor saving devices" (ALA Glossary of Library and Information Science, 1983)

Webster's Third New International Dictionary of English Language defines Automation "automatically controlled operation of an apparatus, process or system by mechanical or electronic device that takes the place of human organs of observation, effort and decision" (Gove, 1986).

Oxford English Dictionary defines automation as "application of automatic control to any branch of industry or science by extension, the use of electronic or mechanical devices to replace human labor" (Simpson & Weiner, 1989).

International Encyclopedia of Information and Library Science defines library automation as "the use of computer-based systems in libraries both for accessioning information (often referred to as information retrieval) and for library management" (Feather and Sturges, 1997).

According to Dictionary for Library and Information Science, library automation is "the design and implementation of ever more sophisticated computer systems to accomplish tasks originally done by hand in libraries" (Reitz, 2004)

Today library automation is by far the most commonly used term to describe the mechanization of library activities using the computer (Uddin, 2009).

Library automation is a complex and challenging process rather interesting as the expectations of users and evolvement of technologies are changing rapidly from generation to generation. The process of library automation was first started in America in 1960s and spread in developing countries during mid 1960s. The process reduces the errors and enhances the efficiency and effectiveness of the library thereby saving the time of both staff and users in managing and disseminating information. Automation improves the quality and speed of library services and improves access to resources. It is a known fact that automation enables easy access to library materials, and allows staff to better serve users and facilitate a multitude of tasks such as acquisitions, cataloguing, circulation, and reference (Egunjobi and Awoyemi, 2012). The process of library automation is meant for managing library's collection, regulating its activities and providing services to patrons in an organized way.

Automation has come as part of modernization of libraries. With the advent of information and communication technologies, (ICT) modern libraries have radically altered their basic and traditional activities for better storage and dissemination of information and knowledge. Automation of library housekeeping operations helps libraries to achieve more effective functioning and to provide better services to the users. Present libraries are witnessing major developments in technology-oriented activities and services for gathering, processing and distributing information to their clients. Library automation also frees librarians from only doing their traditional jobs and gives them time for new services. So that should be a criterion to evaluate the process of automation and its software.

The nature of library automation has been highly impacted by the advancement in computing technologies and presently it has a wide meaning covering aspects hitherto not considered library related. However as far as traditional libraries are concerned automation

is an application of computers for performing the housekeeping operations of the library such as cataloguing, circulation, serial control etc. In India, however computerization was started during 1950s. When Indian Statistical Institute (ISI), Calcutta installed the first analog computer and subsequently HEC-2M, a 16-bit machine which is said to be the first digital computer system to be brought into India. It became operational at ISI in August 1955. Application of computers in libraries started in the year 1965, when Indian National Scientific Documentation Centre (INSDOC) renamed as National Institute of Science Communication and Information Resources (NISCAIR) created author and subject indexes for the publication of Indian Science Abstracts. There have been plenty of works available in the field of library automation. There are papers reporting results of case studies, surveys, evaluations, comparisons, single step process, practical based discussions on current technology and status of library automation and the migration or implementation of automation software focused on a specific library, few concepts of Open Source Software (OSS) and geographically limited studies.

### **1.2.2. Advantages of Library Automation**

Libraries started adopting computers widely and extensively when they faced difficulties in managing their resources and providing quality services to users due to the enormous growth of information in various formats. Libraries get benefited from automation, as many of the tasks related to library are repetitive in nature. Hence, the process of automation reduces the amount of staff time being spent on such repetitive activities. Library automation is the process of application of computers and communication technologies for various library housekeeping operations and management functions. It can save the time of staff in numerous administrative and technical processes, mainly repetitive as well as in organising and retrieving of documents and information. Replacing the manual systems with Information and Communication Technology (ICT) in a library can help in managing collection and circulating the resources swiftly and in organized manner, which can increase easy access to the resources. Automation enhances the quality and effectiveness of library services and helps to serve large consortia group of libraries across the country from a single point. It can also make information retrieval easy and efficient for users and act as a quality management system. Automation enhances the

use of information resources in the library and thereby improves its productivity and efficiency. Duplication of work in cataloguing and acquisitions can be considerably reduced by automation, which can sometimes result in introduction of new quality library services. The process of automation can also gear up circulation of library holdings. Library automation also facilitates exchange of information and sharing of resources in a networked environment to a large group. Automation also helps to generate various reports and correspondence, perform stock verification and enable rapid communication with other networked libraries. Retrieval of bibliographical details of the resources can be done through OPAC from anywhere around the globe which is also one of the highlights of library automation. Up to some extent the automation process helps the library staff to reduce their clerical work and thereby save the time of the professional manpower and moreover help to keep accountability and managing of transactional records in terms of collection as well as financial resources. Development of human resource can also be assured through library automation. Automation enhances the use of information products and services in a larger way and improves the quality and effectiveness of library service even for remote users. Automation enhances the accuracy and promptness in extending the services of a library and hence brings standardization in library activities and services. Library automation can also contribute to recognition of the information infrastructure of the nation.

### **1.3. Library Automation in India**

Though the computerization process was started in India during late 1950s, available literature shows that libraries in India started to experiment with the automation process during late 1960s. During this time, some libraries made efforts to integrate their library work, with punch cards and the second-generation computers available, as the initial step of automation. Author index of Indian Science Abstract created by INSDOC (now NISCAIR) in 1965 was the first automation effort reported in India. During same time, the Documentation Research and Training Centre (DRTC) at Bangalore also started the application of computers. By 1970, many libraries established automated systems in India. However, library automation gathered its momentum in India only by 1990s with the arrival of affordable hardware and the increased availability of software. By mid 1990s

Indian libraries started largely adopting ILSs. To promote automation of university libraries in India, INFLIBNET started its activities in the year 1991. INFLIBNET proved a real catalyst and started from scratch. The real boost in library automation came from the establishment of the INFLIBNET Centre. Before INFLIBNET, scattered efforts were being made in academic libraries especially in specialized institutions like IITs, IIMs etc (Singh, 2003).

### **1.3.1. Generations of Library Automation in India**

The entire phase of development of library automation activities in India can be broadly grouped in to five generations since its inception during 1960s.

#### **First Generation (1960-1972):**

The initiative for computerizing the operations of any library in India started during 1960s when punch cards were used. There were few commercial automation software packages or library software developed in-house available during this period and these were used as stand-alone version in libraries with a little integration between modules. These automation systems were more specific to the operating systems and hardware. Creation of document finding system and union catalogue systems were started in libraries during this generation. Few libraries have started practicing circulation control, procurement control, charging and discharging activities, cataloguing etc. during this period. Shared copy cataloguing systems were also developed during this period, which enabled the libraries to have more collaboration and cooperation.

#### **Second Generation (1973-1985):**

This generation of library automation witnessed the emergence of union catalogues; formation of library consortia and the introduction of inter library loan services etc. Libraries were using campus wide networking to connect the users with its services. Libraries started providing access to Abstracting and Indexing databases over the Internet during this period. Later the Online Public Access Catalogue (OPAC) replaced the traditional card catalogue. Software used during this generation were platforms like DOS and UNIX and functions were either command driven or had menu based characteristics.

**Third Generation (1986-1998):**

Third generation of automation activities in Indian libraries provided full text access to electronic resources mainly e-journals and e-databases. Some attempts to develop full text digital libraries integrating CDS/ISIS and other packages for system and content in different media from various sources have been successfully tested in India like Multimedia compatible Library Automation System (McLAS), BasisPlus/TechLib Plus from OCLC promoted in India by NIC which run on Unix and its customized version developed by some organization in India. But these project far advanced than those times were not sustained due to various factors like lack of awareness and vision, continued availability of expertise etc. The trend of online publishing was also initiated during this period, which facilitates the speedy means of resource sharing activities. Both Local Area Network and Wide Area Network services were used to provide automation and extension activities of the library. Emergence of OSS solutions during this period considerably changed the landscape of library automation activities. The modules in the software were more integrated as they were using relational database management structure. Also the software supports various standards and had GUI based features.

**Fourth Generation (1999-2011):**

Major initiatives like access to digital resources, electronic books and their availability over the Internet round the clock using universal networked systems etc emerged during this period. Libraries were categorized as electronic, digital and virtual libraries and provided advanced services like access to multimedia databases. Software with client-server architecture technology evolved during this period and enabled access to multiple sources and to other servers over the network.

**Fifth Generation (2011-Present):**

Running generation of library automation can be considered as the Fifth generation where libraries are practicing with ILS in all the streams like commercial, open source and in-house developed with all the advanced modules to perform innovative library activities



and services. Automation processes have been now integrated with advanced characteristics such as web 2.0 technologies, e-discovery tools, discovery interfaces, discovery service etc.

The state of automation of libraries in India was very poor in the beginning when only select institutions among IITs and IIMs, Central Universities, DRDO, CSIR, etc. had gone for automation. The recommendations of new education policy evolved in 1986 to improve the information technology infrastructure of libraries of universities and other institutions of higher learning considerably changed the situation. Early 1990s can be considered as the period of modernization in the field of library and information science as the process of modernization of libraries began. Further in 1992, UGC revised the curriculum of library and information science to include computer technologies. Similarly, Government of India, Library/Information Centres like DRTC, NISCAIR, NIC etc and Library and Information Networks like INFLIBNET, CALIBNET, DELNET etc and Library and Information Professionals Associations like ILA, MLA, IASLIC etc. have also played a major role in modernizing and automating libraries in India.

Nowadays, many institutions such as INFLIBENT, NISCAIR, DESIDOC, etc are paying much attention in organizing training programs, short-term courses related to IT and ICT, conferences and workshops etc. to enhance the technical and technological skills of library professionals to make them conscious about utility of technologies in libraries. Similarly reduction in the prices of computer hardware and software, support from Government and Associations, emergence of open source tools etc. has encouraged the professionals to build automated libraries in their institutes.

### **1.3.2. Development of Library Automation Software in India**

Computers that had appeared in the market during sixties and seventies were not economically feasible for most of the libraries in India. Literature shows that there are many indigenous library packages developed by library professionals or subject experts from other discipline to automate the housekeeping operations of the library. Some commercial agencies have also developed library software for general applications in libraries. ARCHIVES, DELMS, ILS, KIURGER LIBRARY MANAGER, LIBMAN, LIBRA, LIBRARIAN, LIBRIS, LIBSYS, MAITREYI, MEMLIB, NIRMAL, ODYSSEY,

PALMS, SANJAY, SOUL, TRISHNA, VLYSIS, WYLISYS etc were some of the indigenous library packages developed on a commercial basis. However, they made revolutionary changes in libraries only during mid-eighties as they became cheaper. The introduction of the software package, CDS/ISIS in India during 1980s by UNESCO made revolutionary changes in Indian libraries. CDS/ISIS was the pioneer of library automation. Organizations such as National Information System for Science and Technology, the Indian Institute of Science and National Institute of Science Communication and Information Resources trained librarians in automation using CDS/ISIS. By 1990s some of the libraries in India recognized the advantages of library automation and developed their own software packages to perform the basic functions of the library. These efforts led to the development of comprehensive automation packages to perform all the house-keeping operations of the library. The experience of using CDS/ISIS software was the inspiration for a few organizations in India like ICRISAT, which later developed their own software for library automation. Examples of such software are DESIDOC's SANJAY and DLMS (Defence Library Management System) and NISCAIR's CATMAN (Catalogue Management). Numerous commercial packages like LibSys, OASIS, Alice for Windows etc. came into the market. During 1991 INFLIBNET started activities to promote library automation among the Indian academic libraries. Gradually a library management software with all integrated functional modules was developed.

The introduction of packages for ILSs has facilitated effective performance of libraries by enabling the automation of housekeeping operations. The adoption of ILSs has taken a quantum jump in Indian libraries especially in higher education sector during the last two decades. It is a known fact that with all these developments the majority of libraries, including college and public libraries in the country, are still in the state of infancy with regard to ICT applications and networking. There are various problems faced by the library professionals at the initial stage in the process of automation and also in providing the automated services from the libraries.

Many libraries in India initially automated their library either with proprietary or in-house developed software to experiment with single or few functions such as acquisitions, circulation and cataloguing etc. Integrated packages with multiple modules were used to

automate at a later stage. According to a study conducted by Lihitkar and Lihitkar during 2011, total of 72 library automation software packages have been implemented in India (Lihitkar and Lihitkar, 2011). The survey result of Londhe and Patil revealed that there are thirty-one open source integrated library management systems available including two e-book management systems (Londhe and Patil, 2015)

#### **1.4. Integrated Library Systems (ILS)**

It is necessary for the libraries to adopt an ILS, which consists of basic modules like acquisition, cataloguing, circulation, OPAC, administration, serials control etc for effectiveness and accuracy. Software for library automation is designed to handle all functions of libraries regardless of their type and size. Effectiveness of library software lies in library operations for which they provide modules as well as the availability of sophisticated tools for information/data storage and its retrieval. Any library automation software should have provisions to support minimum housekeeping operations such as cataloguing and circulation modules. According to modern presumption, the ideal library software needs to be able to function according to the changing information environment adopting most of the functions performed. Flexibility to fit in the needs of individuals is one of the most required qualities followed by assimilation of user-friendly applications and affordability.

The term ILS actually originated from the term Library Information System coined by Dr Ralph Halsted Parker in 1968. Examples of ILSs are WINLIB, LIBSYS etc. ILS was developed in the 1990s with an intention to manage and retrieve print collections in the library. Hence they were lacking modules for managing electronic resources like electronic journals and electronic books. Automated Library System (ALS), Library Management System/Software (LMS), Integrated Library Management System/Software (ILMS) etc are synonymously used to indicate ILS. Most of the ILS in the present scenario offers modules for acquisition, cataloguing, serials management, circulation and OPAC or WebOPAC or discovery interface. However Cataloguing, Circulation and OPAC are the basic modules of any ILS. Breeding in his Library Technology Reports clearly indicated that almost all libraries in the developed world make use of an ILS. In the United States, only very small public or academic libraries, often in rural communities, operate without them (Breeding,

2008a). However the situation in India and other developing countries are dismal but developing gradually. There are several OSS available for various library activities and can be broadly divided into ILS, Digital Library, Content Management packages.

#### **1.4.1. Definitions of Integrated Library System**

The following are the popular definitions of ILS

- An ILS is a computer-based information system consisting of a set of interrelated components or entities and subcomponents that are designed to interact together to perform specific task, functions, and operations and achieve a purpose (Bilal, 2014).
- An ILS is an automated library system in which all of the functional modules share a common bibliographic database (UNESCO, 2006).
- ILS is an automated library system that is capable of managing the operations of more than one basic library functions. (UNESCO, 2006)

Software and hardware are the two core components that support the operations of an ILS. Modern ILSs have their own individual characteristics that make them more attractive in serving users as well as staff. Most of the ILS have modules like OPAC; Electronic Resource Management (ERM), digital library etc. which can work independently. Most of the ILS supports web 2.0 applications like user tagging and reviews, faceted navigation, online reservation, vertical search capabilities etc. Moreover, the quality of interface of OSILS has been considerably improved over the past years, which is much higher than those of previous versions and reshapes the landscape of automation of libraries.

#### **1.4.2. General Features of Integrated Library Systems**

Any ILS will have some common features in their characteristics. A typical ILS consists of functional modules to perform the basic housekeeping operations of a library with supportive protocols and standards to perform exporting and importing of bibliographical details, information searching and retrieval, operating systems and relational databases and networks, programming languages and scripting languages and also user interfaces. Some of the common features shared in a typical ILS are as follows in Table 1.1.

**Table 1.1: General Features of a Typical Integrated Library System**

SI #	Characteristics	Functionality / Software
01	Functional Modules	Acquisition, Cataloguing, Circulation, OPAC/WebOPAC, Administration, Serials Control, ILL etc.
02	Content Management System	Zope
03	Export / Import of Bibliographic Records (Data Exchange)	ISO 2709 OAI-PMH
04	Information Search and Retrieval Protocol/ Standard (Information Interchange format)	Z39.50
05	Operating System	Windows / Linux, MacOS
06	Relational Database (Database Server)	MySQL (SQL database)
07	Web Scripting and Programming Language	PHP, Perl, Python, Java
08	Standard for Bibliographic Records (Database structure)	MARC 21
09	Webserver	Apache
10	Encoding, Searching and Retrieval of Information in Different Scripts	Unicode
11	Database Systems	MS Access / Oracle / Informix / MS SQL, BDB, MongoDB, ISIS
12	Network Architecture	Client-Server Architecture
13	User Interface	Graphical User Interface (GUI)

### **1.4.3. Types of Integrated Library Systems**

Based on its mode of operation and implementation an ILS can be categorized as Turnkey, Stand-alone, Hosted, Software-as-a-Service, Cloud based computing system and OSS systems.

#### **a) Turnkey (Off-the-Shelf) Systems:**

In a turnkey, also called as 'off-the-shelf' system implementation process, a single vendor or the agency performs the supply and installation of the software system. The vendor executes supply of all the devices required to run the ILS system such as software, hardware and server etc. to the library. Also carries out the networking process to access the installed applications. The network model followed by the vendor in this process is client-server architecture model. The vendor also performs installation of the key and associated software applications, its testing and configuration on behalf of the library. In turnkey implementation process, majority of the work is done by the vendor with continuous technical support, training of library staff, maintenance of the software etc. and that is its biggest advantage. However libraries need to pay a huge amount to the vendor to purchase server, software, hardware etc to get all the requirements, devices and services. They can implement an ILS system without having a trained library staff or system administrator. Libraries need to ensure the availability of infrastructure and proper network provisions. Minicomputer based ILS can be considered as an example of turnkey system.

#### **b) Stand-alone Systems**

In this system the library need to purchase hardware and software separately and perform the installation on their own. The network model usually followed in this system is client-server and this also needs to be set up by the library. However the implementation can also be done on a single computer or a networked system such as LAN, WAN etc. Once the implementation of the software is done, the agency or vendor from whom the software is purchased provides technical support on demand. However library needs to make alternative arrangements to deal with issues related to day-to-day operations, bug

fixing, customization, addition of new features, upgrades etc. and also perform activities like server and database maintenance, access management, regular back-ups etc.

### **c) Hosted System**

In hosted system, library purchases the software and hosts it on a server owned by the vendor. Vendor hosts all the details pertaining to the library such as patron's records, bibliographic records and sometimes even library website. Hence the issues associated with software and server hardware will be taken care of by the hosting company. Hosted systems are economical as the library need not purchase the server and also feasible for libraries facing space problem. However issues such as data security, software security, migration to a different system, etc. need to be considered before opting for a hosted system.

### **d) Software-as-a-Service (SaaS) System**

In SaaS, the vendor uses their own server to provide a web based and subscription mode of service to the library as a full-blown application. Instead of purchasing the software, the library has to pay an initial fee to the vendor along with a contract for paying an annual or monthly subscription fee. According to Bilal, SaaS is a "true" cloud computing model in which a designated service provider provides the capability to run the multiple ILSs and other applications on a cloud infrastructure that is shared among libraries using this deployment model (Bilal, 2014). Instead of installing the software, the vendor delivers the software functionalities through Internet, which can be accessed by the library staff through web browser. The vendor is also responsible for data and software security provided by the library and also for performing all software applications, back-ups, maintenance, and issues pertaining to the software and the server. SaaS is economical as it enables a library to save the purchase cost of a server and the cost associated with its maintenance.

### **e) Cloud Computing System**

It is a specialized form of Software-as-a-Service system where the vendor runs a particular component part of the software and performs the configuration within that particular component only. The service is delivered via Internet technologies. According to

the official NIST definition, "cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction" (NIST, 2011). Cloud computing gives more control to the library when compared to SaaS as the data can be moved from cloud environment to library's local storage system. Cloud computing enhances the quality of services and improves the utilization of resources.

### **1.5. Open Source Software (OSS)**

Library professionals are obliged to provide ICT enabled quality services to their users to facilitate them to get up-to-date information in time. OSS first evolved during the 1970s with Richard Stallman, from MIT who coined the term "free software". Richard, and others, were becoming increasingly dissatisfied with the restrictions of proprietary software vendors, and the tendency for more and more necessary software becoming proprietary (closed source) (Appelbe, 2003). However the term was widely used after 1980s. Formation of the GNU project in 1983 by Richard Stallman, the establishment of Free Software Foundation in 1985 and the release of first version of GNU Public License (GPL) in 1989 are the major milestones in the history of OSS. Further the development of Linux kernel by Linux Torvalds in 1991 was also a great initiative to the development of open source. However the available literature shows that the term 'open source' was coined in 1998 by Christine Peterson in a strategy session held on February 3rd, 1998 in Palo Alto, California and, simultaneously, Eric Raymond formed the concept of Open Source Initiative (OSI) model. Open source software usually abbreviated as OSS is computer software where the users of the software can have access to the source code of the software in a human readable text file. OSS is software with an accessible source code, which permits the users of the software to modify the functionalities according to their own needs. Users have the right to modify, improve and redistribute and also have the flexibility to use according to their local needs without any restrictions. Source code is a human readable and non-executable code or instructions written in a computer programming language. Use of OSS makes the user more independent, innovative and creative. OSS are normally available free of charge, however developer or the vendor may charge for its installation,



customization, technical support and training. Though OSS is available for free, the adoption of the software attracts hidden costs such as cost in-terms of its maintenance, hardware requirements, supporting software tools, personnel costs, staff time, training, infrastructure, facilities management and other expenses. The origin of OSS is the result of collaborative effort and this enables making it better or modifying it to suit individual requirements either as customized or as updated version. Visibility of the architecture of the program in OSS and the flexibility to copy and make changes in it enables the user to have more control over the software. OSS provides a degree of autonomy for the adopted libraries in its maintenance and customization. Adoption of OSS enables the library staff to perform more activities and provide innovative services to the user community.

The term 'Open Source' has gained popularity not only among the computer professionals but library professionals also due its extremely constructive applications with the freedom to modify or scale up usage according to their requirement. Sheeja in her article stated that the library and information science (LIS) community first started to take note of open source software (OSS) in 1999, when Daniel Chudnov, founder of the Open Source Systems for Libraries project, wrote an introductory article in Library Journal and has three factors pushing the use of OSS in libraries mentioned by Chudnov are;

- OSS licenses allow libraries to cut budget on software and use it for other issues, which needs more funds.
- OSS product is not locked into a single vendor. Thus even if a library buys an open source system from one vendor, it might choose to buy technical support from another company or get it from in-house experts.
- The entire library community might share the responsibility of solving information systems accessibility issues (Sheeja, 2009).

Open Access, Open Standards, Open Archives and Open Content are the other words associated with open source movement, which reminds us that it is something, which is free and unrestricted. Libraries are great beneficiaries with the advent of Internet and open source technologies to handle the resource and to provide wide range of add-on

facilities to systems and services. The open source movement has provided attractive solutions for libraries, to provide quality services to the patrons. Considering the economical status of majority of the libraries in India, it is difficult to rely on commercial software to automate systems to provide anticipated services. Before the emergence of OSS, libraries automated their house-keeping operations either by developing an in-house software system or purchasing a commercial system. Commercial vendors had a lead role in promoting their products and libraries were totally depending on these vendors. Libraries were charged frequently for software maintenance, updates and every aspect of every task. Before the advent of OSILS, libraries did not have any choice even if they are burdened with their commercial system. However the shrinking budget and the advent of open source technologies progressively accelerated the rate of adoption of OSILS in libraries, especially in developing countries. To satisfy the needs of technically competent generation of library users and to effectively provide variety of functions by managing the products on different formats, selection of suitable automation software is mandatory. In India much research has not been done to understand the efficiency of OSS and its application and implication in libraries. Accessibility to the source code of a software program became possible only by 1998 when the Netscape web browser was introduced. Many libraries in India are not completely automated and many are on the verge of making attempts to run ILSs for their libraries. Hardly 10-20% of the academic libraries in India are fully automated. (de Smet and Dhamdhare, 2010).

### **1.5.1. Definitions of Open Source Software**

According to the definition of Open Source Initiative, the open source doesn't just mean access to the source code. The distribution terms of open-source software must comply with the following criteria (Open Source Initiative, 2015)

#### **a). Free Redistribution:**

The license of the software should not restrict selling or giving away the software as a component of an aggregate software distribution containing programs from several different sources. The license shall not require a royalty or other fee for such sale. Mozilla Public License, Creative Commons licenses, BSD License, Apache Software License,

GNU Free Documentation License are the other open source licenses apart from GNU General Public License. The General Public License enables the software to use, modify and distribute the software for free. As far as libraries are concerned the OSS can be installed for one library and can be re-distributed to other libraries also.

**b). Source Code:**

The computer program normally has an object code and source code. The source code determines the features and functions of that particular software program and is generally restricted in proprietary software. However open source facilitates distribution of human readable source code in which the product is made under some license and the source code of the software can be modified by the user to tune it for local requirements.

**c). Derived Works:**

The license of the software allows any person to modify and reuse the source code according to their requirement without altering the terms and conditions of the license of the original software.

**d). Author's Source Code Integration:**

The license of OSS may restrict source code for modification, only if the license allows the distribution of "patch files" with the source code for the purpose of modifying the program at build time. The license must explicitly permit distribution of software built from modified source code. The derived work may come up with a different name or version number from the original software as new version or release under the same license.

**e). No Discrimination against Persons or Groups:**

The license of the software does not discriminate or limit any person or group of persons in performing modifications or up-gradations so that maximum benefits from the contributors are ensured.

**f). No Discrimination against Fields of Endeavor:**

The license of the software does not restrict or limit anyone from making use of the program in a specific field of endeavor. For example, it may not restrict the program from being used in a business, or from being used for genetic research.

**g). Distribution of License:**

The rights attached to the program must apply to all those to whom the program is redistributed without the need for execution of an additional license by those parties.

**h). License must not be Specific to a Product:**

OSS program is distributed under a software license and unlike commercial software the rights are equally distributed to all. The rights attached to the program must not depend on the program being part of a particular software distribution. If the program is extracted from that distribution and used or distributed within the terms of the program's license, all parties to whom the program is redistributed should have the same rights as those that are granted in conjunction with the original software distribution.

**i). License must not Restrict other Software:**

There is no contractual restriction on the use of the software and the license must not place restrictions on other software that is distributed along with the licensed software. For example, the license must not insist that all other programs distributed on the same medium must be open-source software.

**j). License must be Technology-Neutral:**

The technology of the software is nowhere connected to any specific software or hardware of proprietary ownership. No provision of the license may be predicated on any individual technology or style of interface.

Interest and popularity of OSS has considerably increased and has created excitement among the library fraternity. Support for open source software comes in many

forms, but there is usually strong community-based support provided gratis from developers and other contributors (Burton, 2010). As an innovative and new technology, open source concept brought many changes to library's functions and services, especially as an ILS. If OSS is to widen its appeal beyond very technically adept user developers, this requires a consideration of aspects of functionality, interface and wider support (Singh, 2006). Over the past two decades advent of development of open source and OSS technology has enhanced the rate of adoption of OSILS in libraries. Open source software can unnerve staff and administrators who do not have a full understanding of the concept, the myths and the all-around usefulness of it (Colford, 2009). Application of OSS in ILS is relatively new and the Indian LIS community has recognized its importance as a promising solution for library automation and to justify themselves as an integral part of the organization and as a solution for the constant pressure from management or administration to cut short the budget. Most of the libraries in India are actively considering adopting OSILS in at least some part of their house-keeping operations. Many library groups and associations at ministry level also have started discussions on streamlining their library automation process to opt for OSILS. The importance of using ILS in library automation to perform as a means of enhancing library house-keeping operations such as acquisition, cataloguing, circulation, OPAC, serials management etc cannot be disregarded in the present Information and Communication Technology (ICT) era.

OSS products can be broadly categorized into three according to its mode of usage: Integrated Library Systems (Eg: Koha, Evergreen, ABCD, NewGenLib); Digital/Repository Software (Eg: Dspace, E Prints, Fedora) and Discovery Interfaces (Eg: Vufind, Blacklight, SOPAC (Social OPAC), eXtensible Catalog). OSS is often developed by a group of people or institutions in a collaborative manner as service for the benefit of the society and profession. The modifications and customization of the software can be done according to the local requirements of the institution or organization by making use of free source code. Users have the right to change the source code to enhance and modify the software according to their own requirements. The OSS model has been largely supported and promoted by the community of individual users and many library professionals are also part of the OSS development. Amollo in his research study conducted in Kenyan libraries justified the importance of OSS in libraries in two statements, (Amollo, 2013) as:

- OSS is an economical alternative to libraries' reliance upon commercially supplied software. That is, despite the cost incurred in development, maintenance, and use of OSS software, they are still lower than those incurred with commercial software.
- OSS is essential if developing and under developed libraries are to develop software and systems that can meet their needs. With OSS, the IT infrastructure that is essential for library operations and services can be open and ubiquitously made available to libraries. They may be tailored to suit the needs and circumstances of individual libraries and documented for future use/users. Errors can be also be identified and corrected.

### **1.5.2. Benefits of Open Source Software**

OSS applications have many advantages over commercially distributed software. The development of the software is in a collaborative manner by a group of motivated people without seeking any marketing advantages, which make the software cheap, as well as of high quality and reliable. Unlike commercial ILS, the development of the OSILS is determined by the needs of its user rather than the commercial vendor who supplies it. There is no purchase or maintenance cost for OSILS and neither is there any restrictions on its use. However it attracts costs in terms of its local customization and developments. Some of the major benefits of OSS are listed below.

- Availability of source code to modify, improve and customize
- Economical and cost effective solution to learn and experience
- Liberty to examine the logic of the application
- Localization according to individual and specific requirements
- Development is rapid and more responsive compared to commercial products
- No cost to download and install and less maintenance cost
- Easy evaluation
- Availability of quality documentation for free
- Reduced risk of service discontinuity
- Increasing reliability and quality due to peer review system
- Freedom from vendor lock-in

- Freedom of licensure
- Freedom to innovate
- Freedom to redistribute
- Collaborative environment
- Options to make user-centric customizations
- Reduces automation divide among the libraries

### **1.5.3. Challenges of Open Source Software**

Of the numerous challenges for use of OSS the following are considered to be of important ones to be taken care of.

- Initial cost for the implementation of OSS may be high if done by a commercial firm
- Cost of implementation and annual maintenance can be substantial if it is outsourced to a service provider.
- Involvement of community may be discontinued
- Responsibility on bugs and errors may not be individually focused so that the progress in addressing the errors will be delayed.
- Level of customization will be comparatively low
- Effort of the librarian in customizing for local need is more
- Inadequate technical support for the users to solve problems on time
- Limited documentations
- Less scalability and speed of the software compared to commercial software
- Decentralized mode of development sometimes slows down the progress and trouble shooting of the software

### **1.5.4. Open Source Vs Free Software**

The two term 'free software' and 'open source software' are often used interchangeably and sometimes designated together as Free/Open Source Software (FOSS). However both the terms are used synonymously to denote free distribution of software. Free distribution of software comes about with a licence and the popular licences used for

the free distribution of software are mainly GNU General Public Licence (GPL), GNU Lesser General Public Licence, BSD Licence, Mozilla Public Licence, Apache Licence and MIT Licence. Each software licensed under any of these licences ensures the free use of the software, but differ in their terms and conditions of usage. Free software is not the same as OSS and it does not mean that it is available for gratis. Free means freedom or free restriction (which gives liberty to use, modify and share the source code) and it may or may not be open source, depending up-on the accessibility of the source code. Free software can be free or commercial and sometimes a user has to buy the software. Having free software does not mean having software without cost. When it comes to free software, the institution does not pay the software license price, but it does pay the experts to implement, adjust and maintain the system (Conc, 2013).

According to the definition of Free Software Foundation (FSF), Free Software is a matter of the users' freedom to run, copy, distribute, study, change and improve the software. More precisely, it does not mean that the program is 'free-of-charge' but it gives freedom to users to:

**Freedom 1:** Run the program, as you wish, for any purpose.

**Freedom 2:** Study how the program works, and adapt it to your needs. Access to the source code is a precondition for this.

**Freedom 3:** Redistribute copies so that you can help your neighbor

**Freedom 4:** Improve the program, and release your improvements to the public, so that the whole community benefits. Access to the source code is a precondition for this (GNU Operating System, 2015)

According to an unknown FSF advocate, Open source is a development methodology; free software is a social movement. However in the case of open source, the software code would be available to the user, which can be edited, modified and redistributed. The major difference between open source and free software is that the license of the OSS meets the requirements of the Open Source Definitions (OSD) provided by Open Source Initiative.



Despite the few ideological differences between open source and free software, for practical purposes they provide the same basic advantages (and challenges) in a library or information science setting. For this reason, they are often referred to under a collective term such as "free and open source software," FOSS, F/OSS or other terms (Colford, 2009). To initiate the free software concept, Richard Stallman in 1984 formed the Free Software Foundation (FSF) followed by the origin of Open Source Initiative (OSI) in 1998 which shows that all the OSS are historically evolved from free software.

#### **1.5.5. Open Source Software Movement in Indian Perspective**

The philosophy behind the concept of OSS is to mutually exchange the skills, knowledge and expertise to improve the software for the benefit of the public. Open Source movement was derived from free software movement as a social movement to dilute the monopoly of commercial software vendors. Richard Stallman in 1983 started free software movement with the GNU project to provide freedom to use the software without any licence restrictions and to have control over the software. Unlike free software movement open source movement aims to give full freedom to access the source code of the software along with its executable software, there-by enabling the users to edit improve and add additional features to the software.

OSS movement has made a great impact in the developing countries and is gaining momentum in India for the last two decades. OSS movement is a phenomenon that is affecting the foundations of software industry. OSS even though it breaks many limitations of commercial packages, also provides many challenges for planning, since their code itself will be worked on by different programmers and evolved over time. It is anticipated that OSS will effect radical changes in Indian libraries in regard to ILS. In India, approximately 10 % of the libraries are automated and only 30% from among them uses OSS. Available literature shows that libraries using OSS and commercial package are both facing numerous problems like lack of service, lack of updating, difficulties to export data to newly acquired packages due to commercial vendors blocking them, difficulties for customization due to non-provision of source code etc. Recent survey on OSS solutions in Indian libraries by Hanumappa and others revealed that a significant number of Indian libraries do have ILS

(Integrated Library Management System) software solutions implemented (Hanumappa, 2014)

## **1.6. Categories of Library Automation Systems**

Based on the nature of developments or the origin of the software, library automation systems can be classified into four major categories namely in-house developed system, individual developed system, commercial ILS and open source/free ILS.

### **1.6.1. In-house System**

In-house System is a particular automation package that is developed by a particular institute to meet that particular institute library's local requirement. The software will be a highly customized one to meet the internal needs of that specific library. In India IITs adopted in-house software developed by the departments of computer science, engineering etc for their libraries as their automation strategy. The intention behind the development of such software is to handle the problems pertaining to software and hardware maintenance efficiently and effectively in-house and also because they have a large database, which needs to be safely managed. The in-house development of the software is made possible because of the availability of expertise in IITs etc (Chandra, 2003).

### **1.6.2. Developed by Individuals**

The packages developed by individuals would be difficult to upgrade or get migrated to another system if the developer is not available as it is highly dependent on that developer.

### **1.6.3. Commercial Integrated Library System**

Commercial software also known as proprietary software or closed software and they do not provide any access to source code and unlike OSS, has restrictions on the number of users or ports. Software supplied by a commercial vendor, who is responsible for maintaining, updating, providing technical support, and training (also known as turnkey or off-the-shelf) is defined as proprietary software (Bilal, 2014). Users need to pay for licenses and the modifications done by a service providing company. The customer is not

allowed to edit, modify or customize the software in any way. The majority of commercial ILS are costly and are protected by copyrights, which reduce the flexibility in its use. However, depending on point of view some will consider this an advantage. The biggest disadvantage for a customer using commercial software is their dependency in modification or additions, which will be done by the manufacturing company on their priority. Commercial ILS usually owned by a company or individual is a product to make profit by selling the license. Non-availability of source code, high cost and no control over the data and software are negative aspects when viewed from the professional user's side. Moreover many modules in costly commercial software are underutilized or not essential in many libraries; in India especially with smaller libraries having limited operations. In most of the commercial solutions offered, there would be a predefined structure for the library activities to be done through software which the company does not give consent for modifying or restructuring after purchase as per library needs. Instead the libraries have to change their ways of functioning to fit into software characteristics. This may create problems for some libraries looking for change over through retro conversion or having some special requirements. The major issues associated with the adoption of commercial / proprietary solution for libraries are poor technical support, limited flexibility, lack of interest in new developments and updates, initial implementation cost, and other charges to support the software activities etc. Limitation on usage, personalization and distribution with a high annual license and maintenance fee also leads to reduced adoption of commercial ILS. Commercial ILS is different from one system to other in its pricing and license agreements.

Many commercial ILS available in the software market are not frequently updated to keep pace with advances in library technologies. The flexibility and adaptability of commercial ILS become comparatively less than OSILS. Many of the libraries in India consider OSILS to be an opportunity for innovation by customizing the software to meet their specific requirement more than as a means of cost savings. However commercial ILS vendors provide guaranteed support services as part of their annual maintenance cost. But, many commercial ILS are getting outdated from the market due to their limited functions and incapability to manage electronic resources. Some of the existing commercial ILS are found to be stable but are static for many years without any constructive updates or developments. Continued enhancements in licensing and annual maintenance fee and

additional expenses for smaller upgrades also have led to less popularity of commercial ILS. Unlike OSILS, as the source code of the software is closed and controlled by a particular vendor or company, the discontinued support, mergers with other ILS vendors or going out of business etc. of that particular vendor/ company forces libraries to migrate to other ILS. Commercial ILS vendors keep their licensing agreement and contacts confidentially and libraries have to pay different prices for the same software according to their negotiation capability. Moreover libraries have to rely on a specific vendor only for their support and development of the software product and to retain the service libraries have to make huge investments each time. When a firm providing commercial software and its maintenance closes, it is not sure whether they have agreement to provide continued support with other companies or that the library can export data to new package. The loss that the libraries may have will be beyond imagination.

#### **1.6.4. Open Source Integrated Library System (OSILS)**

Open Source Integrated Library System (OSILS) offers significant benefits compared to its commercial counterparts as a scalable library automation tool in general and as a cost effective solution in particular. Application of OSILS can drastically reduce the cost compared to a proprietary software. It is often found that in commercial software, update and maintenance happen only in the most used features to attract the users to get the marketing advantages. OSILS usually reduce the complexity and encourage the users to use it with ease or can be made user friendly by user. Generally, emergence of OSS is the result of collaborative innovation. Since the source code of the software is freely available, it can be experimented, edited, modified and distributed even by a non-software person. These features enhance and improve the quality of the software on a regular basis. Full control over the data and the software attract the user's attention, which in turn influences them to choose OSS in comparison with the vendor locked proprietary software. OSS as mentioned above is the outcome of collaborative work of a group of people or institution where the members of the group are unpaid for their efforts and services. Collaborative work reduces the unnecessary features and complexity of the software by participation and discussions. Adoption of open source is an opportunity for library professionals to execute innovative services at low-cost. In other words, it considerably improves the level of technical

knowledge and expertise among the library professionals. It also provides significant economical and technological advantage to the libraries and reduces dependence on software and services provided by the vendors. Because of the budgetary constraints evidenced in majority of libraries in developing countries, OSS would be an affordable option at the outset for libraries that wish to automate their processes, but do not have the necessary expertise for installing and implementing software packages (Amollo, 2013)

Several commercial library automation packages are now available. But their costs are beyond the reach of most of the libraries. Even if libraries can afford these packages, the invisible costs and the control of the source code by the software vendors, curtails the freedom of software and is a serious problem, solving of which will be very costly. Osaniyi (2010) opine that several library management software have thrived with much patronage, most of the software have failed resulting in waste of time, fund, and energy (Osaniyi, 2010). In this scenario, OSS is crucial for Indian libraries to organize, maintain and disseminate the information in the traditional environment as well as in modern environment specifically over the web regardless of the documents they hold, with zero investment for software as well as zero recurring cost for its maintenance and up-gradation. An ILS is the minimum solution required in any library to harness ICT for managing resources and providing services using available resources. Open source can also improve library's freedom by reducing their reliance on vendors, and allowing them to make their systems what they actually need them to be, rather than what the vendor will provide them (Johnson, 2008). OSS, available for various library applications are user friendly, free and offer an easy platform for organizing, publishing and sharing information via local area networks and Internet and also in CD ROM with less system requirements. Moreover, there are international organizations behind them who continuously support research and development as well as continuous up-gradation based on user surveys. ILS software can be a huge expense for libraries, so it is not a surprise that libraries would be interested in the opportunity to obtain an open source system for free when some proprietary packages can cost anywhere from tens to hundreds of thousands of dollars (Eyler, 2003). Open source solutions generally do not come with professional technical support or training; and as a consequence libraries may find that the economic benefits associated with OSS i.e. low, upfront costs can be wiped out by the various expenses involved in fixing problems or

learning cumbersome workflows (Samuels and Griffy, 2012). The present study will examine the OSS currently available, those popular in India, and the facilities they offer as well as the appropriateness in using them or changing over to them from the commercial software presently used in Indian context.

There are several OSILS systems available, which are of domestic and foreign origin. Popularity of OSILS for libraries in India is growing day by day and majority of the libraries in the country are considering it as an alternative to expensive commercial ILS. In case of proprietary ILS, though they provide excellent technical support, library does not have any control over the data, software and the direction of its development. Each time library needs to pay for adding new features or for modifying the existing provisions or any customization according to their local changing requirements. However a country like India, with diverse languages, has numerous issues and concerns in adopting OSS than those countries having a single language or using one of the international languages. It is not easy to adopt suitable software, which supports and accommodates all the requirements of a particular library. Moreover the wish list and technical criteria of one library may be different from the other. Selecting the right software for an organization or institution such as the library could be a challenging task considering the fact that organizations adopt these technologies with the aim of - increasing their productivity, addressing operational challenges, increasing their level of competitiveness and reducing their cost of operation (Ngozi and et al, 2014). Library professionals are concerned and confused about the selection of suitable software keeping in view their limited budget, inflation, rising cost of electronic resources etc. In this context, this research work examines how the OSILS are presently being used in Indian libraries and discusses the possibilities of choosing particular software, which is suitable for all kind of libraries with provision for in-house customization.

### **1.7. Selection of OSILS for Library Automation**

The decisive task of selecting software determines the success of library automation. The people involved in selection must hold enough knowledge of how library functions and the ever changing requirements of today's users. The selection committee should also consider the needs and wants in an ILS program based on the features of their

library and roles they want to perform. The selection of software for library automation that best fits the requirements of both the staff and user, depends on many factors such as the nature of the library, size of the collection, personnel resources, technical and technological skills of library staff, financial resources, single or library in a consortia environment, user requirements, technical support etc. In selecting software for library automation, first, it is important to have adequate knowledge of the available software. Secondly, to verify the software capabilities, weaknesses, and possibility to meet the needs of users as well as future improvements (Omeluzor, 2012)

**Table 1.2: List of Country wise Development of OSILS**

Sl No	Developed Year	Open ILS	Country Developed
01	1998	Avanti MicroLCS	United States
02	1999	PYTHEAS	United States
03	1999	Koha	New Zealand
04	2000	OPALS	United States
05	2001	PhpMyLibrary	Philippines
06	2002	PMB (PhpMyBibli)	France
07	2002	OpenBiblio	Spain
08	2003	Emilda	Finland
09	2004	WebLIS	Poland
10	2006	Evergreen	United States
11	2007	LearningAccess ILS (LA ILS)	United States
12	2008	NewGenLib	India
13	2009	ABCD	Belgium/Brazil, Venezuela

OSS has been a subject of attention not only for computer professionals but also for library professionals for the last two decades in India. However choosing appropriate software for automation is a major challenge for any library. In order to effectively implement the selected OSILS software, libraries have to overcome many challenges and difficulties. Suitability of particular software for a library depends on several practical

aspects. There are several OSILS programs available for libraries of various kinds. The major OSILS according to their origin or transformation as open source have been classified in Table 1.2.

OSILS has been available for many years and is having exponential impact in library automation community during the past few years. The selection of suitable software is a major task before implementing the automation process. The selection decision can be based on many measures such as community support, experiences of other library using similar software, frequent updates, compatibility, through the experiences of professional friends etc. Professionals should have a clear perspective on OSILS before they adopt them. According to Dennison, using a hosting company is an excellent way for a small library to obtain specific ILS expertise at a reasonable cost (Dennison, 2011). Word of mouth always plays pivotal role in getting reliable reviews of a product. Libraries that choose the OSILS option must be prepared to commit significant staff, time and money in order to take full advantage of the benefits OSS offers (Foote, 2010). Visiting the libraries using intended OSS may help to understand the prospects of the software and also help in getting professional contacts and enable to become a member of the user community. Before making a decision some research should be done on the organizations which have developed the concerned package, their present status, the list of their mailing community, the companies if any providing support for customization in their standing etc. References from other libraries on the package should also be obtained. Choosing the hosting company is the most important aspect for a small library, since they will be the installation and maintenance experts. The former service manager of OSS Watch, Metcalfe provides some top tips for selecting OSS such as performance, reliability, reputation, ongoing effort, standards and interoperability, support (commercial), version, documentation, skill set, project development model and licence (Metcalfe, 2013). However, as libraries in India increasingly adopt OSILS there is a wider understanding within the library community on the advantages of the software. Singh identified eight stages in the adoption process of an open-source ILS starting with the evaluation of ILS and ends with long term maintenance plans. The stages in between includes creating a demonstration site to reach a conclusion on which ILS should be chosen, data preparation to make uniformity and consistency in its records, identification of development and customization needs for that particular library,



preparation of workflows and policies for data migration, Preparation of quality documentation and training for staff and marketing for patrons, and going live to ensure the successful adoption. (Singh, 2013b)

### **1.7.1. General Features of OSILS**

Considerations need to be given to all the aspects and issues when choosing new automation software. The following considerations have to be taken into account. The selected software should be user friendly, popular and adaptable enough to meet the objectives of the library. Growth and efficiency of the software in terms of its functionalities and performances and other characteristics to attract the users over time needs to be evaluated. Usage restrictions and rights of the software, if any, in-terms of its license agreement also needs to be reviewed before selecting the package. Software should be available in the public domain to download along with adequate and well designed documentations. The software should follow standard data format and support internationally popular standards like MARC, Dublin core, Z.39.50, UNICODE etc. and should be scalable to support large volume of data and its extension. Growth of discussion list and shared online platforms, ability of the software to accommodate future development activities and next generation characteristics, geographical distribution of the software, compatibility and availability of the software in different languages, support from other agencies to install, maintain and to provide training, availability of search options like Boolean, truncation and different displays of the results, level of administrative settings, provisions to assign staff and user privileges, consortia characteristics, quality and scope of generation of various reports and their customization/manipulation with minimum programming skills, level of satisfaction of users through satisfaction survey results, current active development of the software package, rate of use of the software in other libraries and their feedback level of promotional activities etc. also needs to be critically analyzed. Also the software should have provisions to configure emails for sending out communications to the users. The software should also be capable of working off line. Continuity of the software needs to be measured in terms of its growth of effective users.

### **Availability of Functional Features**

The software must be capable of supporting all the basic functional operations of a library such as acquisition, cataloguing, circulation, serials management, OPAC, inventory, data exporting, inter library loan, reports, administrative modules, federated searching, discovery interface etc.

### **Economic Feasibility**

The software should be economical in-terms of its hardware and Operating System (OS) and other software requirements. If the ILS has been developed under open source stream and supports the associated requirements such as platform, licence, server etc in open source mode and follow minimum hardware requirement, adopting it would be more economical.

### **Platform Independency**

The ILS should be platform independent and should be compatible with multiple platforms and also should run on Windows, Linux, UNIX, Solaris, Mac OS etc. The software should not attract any additional expenditure to purchase or migrate to a different platform.

### **Availability of Documentation**

Availability of training and self learned materials needs to be checked. Besides, adequate documentation to support downloading of data from a public domain also should be available.

### **Community Participation**

The size of the community and its activities also forms one of the important considerations while adopting an ILS system, which guarantees continuous improvements of the software and its future sustainability. The role of online community participation is the prime factor in the success of the OSILS development model. This community consists of inter-networked groups of people paying special attention to a common technological

need with similar interests, which helps other people in using the free software application. Growth and sustainability of an OSILS depends on its community participation of developers, potential contributors and users. Sharing of knowledge and expertise among the collaborators highly influence the growth of the software. Users can contribute and promote to the growth of OSILS through writing its codes and documentations, solving bug problems and by educating the users through training, workshops etc. If a person has knowledge on systems and programming languages he can contribute a lot for the development of the software.

### **Costs of Hiring Additional IT Staff**

There are number of hidden costs associated with the adoption of OSILS. One such concealed cost emerges when the library lacks sufficient staff commitment to work on OSILS. In such cases library requires additional technical expertise to install, configure, maintain, customize and upgrade the software according to the specific requirements of the library.

### **Costs of Contracting for Support Services**

If the library does not have sufficient in-house technical expertise, it needs to get support from external consulting agency for the development and maintenance of the software, which will be expensive.

### **Software Support or Upgrades**

Unlike commercial ILS, OSILS cannot guarantee software supports on upgrades and customization on time if they do not have a contract with a commercial firm. Library professionals need to build capacity and familiarize themselves with the functions of the software through training.

### **Quality and Reliability**

The features and functions of OSILS are similar to commercial ILS with more user friendly features. However misconceptions on the quality and reliability also cause major impediments to the wider implementation of OSILS. Before selecting a software, its user-

friendliness in searching mechanisms, on screen contextual help functionalities, error alert messages, interactive dialog boxes etc. need to be checked.

### **Security and Privacy**

Unlike commercial ILS, source code of OSILS is available for public scrutiny so that it is easier to find the bug and fix it at the initial stage itself. Moreover the source code is always under a public review system. Hence the security related issues with the software are comparatively insignificant. However quality of the software developer, tools and techniques used by the development team to develop the software and their interactions and relationship with the customers need to be evaluated before choosing the software in order to make sure that the software is secure to implement and continue. Control over data and software needs to be protected.

### **Supporting Various Standards and Formats**

System should support various formats irrespective of the program, language and platform being used. UNICODE support needs to be assured which is most important in Indian context. The ILS must comply with the standards and formats such as MARC-21, Z39.50 etc. on both client and server sides. Most of the ILS are generally intended to manage printed collections. However, keeping in view the advancements in technology and digitalization, provisions to accommodate digital content and options for managing electronic journals needs to be incorporated and considered while choosing an ILS.

### **Next Generation ILS Characteristics**

Next generation features are required to be accommodated with the ILS in order to effectively manage the processes of house-keeping operations and making available all the library resources according to the changing needs of libraries and its patrons. Software should have options to accommodate the changing format of the resources from print to electronic, digital, audio, video etc. and also other web 2.0 technologies. According to Wang and Dawes, the two pillars of the second-generation library automation system are : (1) it will manage the library resources in a comprehensive and unified way regardless of resource format and location; and (2) it will break away from the traditional ILS models

and build on the service oriented architecture (SOA) model (Wang and Dawes, 2012). The four distinguishing characteristics of the next-generation ILS ascertained by most of the studies are comprehensive library resources management, system based on service-oriented architecture, meeting the challenges of the new library workflow and next-generation discovery layer.

### **Data Migration Facility**

Process of migration from the existing legacy system to another system is a complex process. The software should support the process of moving from one ILS to another if the library desires to go for it for meeting their requirements better than the existing ILS and the exporting of data from any application also needs to be supported.

### **1. 7.2. Major Features of OSILS**

An ILS provides all advanced features compatible for a web based environment in regard to the following: Functional Modules, Operating Systems, Database Management Systems (DBMS), Network Architecture, User Interface and Library Automation Standards. OSILS provides further advancement and flexibility in using the software. Adoption of OSILS is a viable alternative option for libraries to cope with the commercial systems. OSILS has many advantages compared to its commercial counterparts.

#### **Free**

- Free to download and use.
- Free from initial purchase fees, license restrictions and up-gradations
- Free from ongoing maintenance fees
- Free from vendor lock-in
- Free to modify, improve, enhance, customize and control
- Free in terms of customer support services, availability of documentations
- Free to design the user interfaces and user friendly programs
- Free to fix bugs and develop additional features
- More data security and self-sufficiency

### **Not Free**

- For the development, hosting, training and customization of the software by an agency, service provider or vendor
- For migrating or extracting records from the legacy ILS software systems and converting those records to be readable by an open-source system
- System development

### **1.7.3. Major Processes Involved in Adopting OSILS**

Considering the economic realities of libraries in India, library professionals need to consider technologies, which reduce the cost associated with the software and technologies to manage and retrieve the information resources and services. Free and open source software and systems and cloud-based initiatives can provide innovative approaches librarians should consider (Jackson, 2011). Implementation or adoption of OSILS requires a systematic approach. Selection of suitable software according to the specifications and requirements of the library is more important in the initial stage. Community participation and their activity in its development needs to be thoroughly checked before choosing an OSILS so that the implementation of updates, new features and the sustainability of the software can be guaranteed. Installation and customization according to the needs of library as well as users are the other processes to be considered seriously. Training and updating the staff with the software also needs to be considered. Updating and maintaining the system are the most essential factors to be considered when selecting an OSILS. According to Singh, to successfully migrate to OSILS, librarians must learn how to work with new technologies, how to evaluate projects, how critical pieces of software fit together, and what key functions of their library systems are to be attended by it (Singh, 2013a). According to Hanumappa et al., in addition to cost advantage, collaborative development and sharing and freedom from vendor-lock in are some of the major advantages of OSS implementation as far as Indian libraries are concerned. Among the concerns, professional support and documentation and training need to be taken into account while implementing OSS solutions in India (Hanumappa, 2014). As OSILS requires strong technical knowledge to maintain the server and the systems, support of technical expertise is required for successful implementation and management. OSILS can enhance access to information and

knowledge, enable collaborative research, as well as innovations and communication at inter and intra institution levels and shall also enable to meet the demands of the present and future generations for barrier-free information services.

## **1.8. Nature Scope and Method of Study**

### **1.8.1. Definition of Terms**

The following are the terminology used to express the specific topic of the present study.

**Open Source:** Original source code of the software is given to the users to modify, if required and then to compile and use.

**Software:** Software is a set of instructions given to a computer to perform a specific task in a desired manner. These instructions are normally written by programmers in programming languages and are readable by human beings and are referred to as source code.

**Open Source Software:** A software application where the source code of the software is available for use, as well as to copy, edit, modify and distribute. The human-readable source code is made available under a copyright license that meets the open source definition. OSS is often developed in a collaborative manner. In other words, a software program distributed with the source code under a license, typically the GNU Public License and the license permits others to modify the source code and re-distribute it with the appropriate notifications.

**Integrated Library System:** The term 'Integrated' refers to the capability of a system to share data among its modules. An ILS is an information management and retrieval system software designed to perform the housekeeping operations of a library such as circulation, cataloguing and online public access catalogue known as basic modules as well as other additional or acquired modules for acquisition, serial control, digital content and media management. An ILS act as a database of a library holding, patron's details and the procedures acting on it.

**Indian Context:** The study is focused only in Indian libraries.

Relative Appropriateness: Appropriateness is based on comparing of use, performance and perception, market share, awareness of OSILS etc in addition to the comparison of OSILS with commercial software. Relative appropriateness is the technical and technological capability of an ideal OSILS, both for print and e-resources compared to other software.

### **Open Source Software for Integrated Library System: Relative Appropriateness in the Indian Context:**

The study is aimed to compare OSILS with Commercial Integrated System and assess the appropriateness of OSILS based on comparing of use, performance and perception, market share, awareness etc and identify analyze an ideal OSILS, for managing both print and e-resources in Indian libraries.

#### **1.8.2. Objectives of the Study**

Many of the Indian libraries are not automated. Among the automated libraries, different libraries are using different types of automation packages, which could be commercial/proprietary, free/open source, in-house developed or developed by other companies. The study conducted a survey of the Indian Libraries in regard to the use of ILS packages, both commercial and open source. The study intends to identify the relative advantages and the problems faced by libraries using both streams of solutions. But the primary objective of the study was to assess the possibilities for use of OSILS for library automation in India and to make a comparative evaluation of the functional performance of the major OSILS category presently used in Indian libraries.

The main objectives of the study are:

1. To identify the OSS available for Integrated Library Automation Systems
2. To conduct a survey on different ILS used for library automation in India
3. To assess the functional characteristics of major OSILS used in Indian Libraries.
4. To identify the problems faced by Indian Libraries using OSS and commercial ILS solutions.



5. To assess the customization required on features and functions of OSILS in Indian situations listed in 4 above.
6. To suggest the evolving of a model solution that can serve the Indian context based on the engine of one of the solutions reviewed.

### **1.8.3. Hypothesis**

The study was initiated with two hypotheses in mind. Due to the huge quantum of documents in different formats that libraries have to manage in these days and the need for speedy supply of document or information, library automation is essential but major part of the Indian libraries remain un-automated due to the high cost for purchase and maintenance of automation packages. Even though very powerful OSILS packages have come into existence, lack of technical knowledge and support, shortage of skilled staff and lack of promotional activities are hindering their adoption.

### **1.8.4. Methodology Used**

The study used mixed methodology. Questionnaires and Interview Schedules were used to extract data. Today, many people prefer to answer a brief survey displayed on a screen instead of filling in and returning a printed form (Shneiderman and Plaisant, 2009). A general Questionnaire was used for the pilot survey. The main Questionnaire consisted of three parts, a) PART -I: Common Questions for Libraries using any Integrated Library System (ILS) b) PART -II Questions meant only for those libraries who use OSILS and c) PART -III Questions for those who use an Integrated Library System (ILS) package other than 'Open Source' that is Commercial or Proprietary or In-house or Software developed by individuals. Interview schedule was also used to extract information from the three categories of users. The above instruments were used to examine the functional characteristics and performance of OSS meant for ILS.

### **1.8.5. Samples Used**

The sample used for study were the libraries in India using different ILS identified by the questionnaire used for pilot survey which was mailed to approximately 600

universities and 300 research organizations and randomly selected 800 colleges. Of these only 601 institutions have responded and found to be using ILS such as Koha, NewGenLib, e-Granthalaya, ABCD, Evergreen and GenIsisWeb under open/free software category and Libsys, SOUL, SLIM, Autolib, Virtua, Libsoft, Easylib, Alice, ERP (Enterprise Resource Power) System, Liberty, LibMan, Nirmal B, Troodon, Bees Campus Soft, Delplus, e lib, Libsuite, Lib Technology (Lib Tech), MODERNLIB, Rovam LMS, TCSion, EZ Library, Grandha, LIBEX Software, LIPS, LSPremia, NetLib, SMSLMS (SMS Library Management System), Vidya, BookMagic, CMS, Cella System, GLAS (Graphical Library Automation Software), InfoLibrary, Librarian 5.6, Library management software, Library Software, Libris, LIBRERIA, LIBWARE, Lyceum, MICM Net Solutions Library Software, MIS, Phoenix Informatrix LMS, QSNET, Scholar, Serosoft, SMARTCAMPUS, Softaid, Think NEXT, TLSS: Total Library Software System, Vriddhi, WEBSIM, Bees Campuslib, DNA-ERP, ILS, LIBASOFT, Shikshankranti and other in-house systems coming under proprietary ILS category.

#### **1.8.6. Scope and Limitations**

Application of software packages for various operations play a crucial role in libraries in performing its daily activities. OSS technology can be used in various areas of libraries such as automating house-keeping operations, creation of digital libraries, institutional repositories, content management and learning management portals. However the research study focused only on ILS to automate the house keeping operations of the library. Though there are many ILS in both Commercial and OS stream present study uses the responses of only those who have responded to the questionnaire from India. Also attitude of both commercial and OSILS software are evaluated. Even the selected ILS being used worldwide may have different versions prepared by users and may be working better in other countries than in Indian situations; but they are not under the scope of this study. Hence the present study is limited to the versions of the packages used in India. The systems in which they are used in India, the problems faced in Indian context etc. forms the scope of this study.

### **1.8.7. Significance and Expected Outcomes of the Study**

OSS is the emerging trend today and has started to dominate the information industry. The libraries are the great beneficiaries of the OSS technology especially when it comes to the automation of housekeeping operations. Automation and Networking is the need of the hour for Libraries of the present day. Commercial software is costly. Most of the Indian libraries do not have sufficient funds to afford them. There are approximately three lakh rural libraries existing with meager resources. Purchase of commercial packages will be beyond the capacity of 99% of those libraries. So anything that can help libraries to do more with less is a huge benefit for the public. The OSS covered is freely available to use, amend and adapt and the libraries can use them instead of costly commercial software without any financial burden. Any such study about the selection of suitable software for a specific group of libraries can benefit in future developments and improvements of the information service scenario.

The review of literature shows that 99% of the public libraries serving the rural communities are not automated. Even the 50% of about 650 university libraries and 70% of about 20000 college libraries in India are not automated in its true sense. This is due to the lack of appropriate ILS solutions, human ware, lack of funds and also the lack of knowledge on the availability of suitable ILS solution. So the knowledge resources existing in the libraries, which may cost 100 times more than the software solutions to be used, are not coming into full utility. The present study can help to identify an appropriate ILS solution which the Indian libraries academic and public, especially rural libraries can acquire free of cost. The study also will recommend the best solutions from the numerous solutions available. The study can help to identify the problems and requirements of the ILS in Indian situation, which can help government to identify an opt package meant for ILS, customize it and supply one or more customized versions to different types of libraries serving different categories of users at different levels. Progress made in the field on OSILS in India is mainly based on the personal interests and efforts of the library professionals. In general, OSILS are unfamiliar to majority of the professionals and they continue to depend on proprietary software for library automation, information management and related issues. Concerted efforts, intervention, orientation and path finding tools are to be implemented for

the spread of OSS and OSILS based information services in the Library and Information sector. The study will be of benefit to lakhs and lakhs of libraries functioning with less financial and human resources to improve their systems and services. Knowledge being the most important factor contributing to quality improvement in all spheres of development OSILS can help in knowledge management and dissemination and also narrowing of digital divide and help for sustainable development of the country.

### **1.8.8. Organization of the Present Work**

The present research study has been planned in different sections which forms seven chapters as follows.

Chapter 1: Introduction

Chapter 2: Review of Literature

Chapter 3: Data, Sample and Methodology

Chapter 4: Commercial ILS in Indian Libraries

Chapter 5: Open Source ILS in Indian Libraries

Chapter 6: Analysis, Discussion and Findings

Chapter 7: Conclusion and Recommendations

### **1.9. Identifying Right ILS**

Library automation is one of the sensible aspects of any type of library and it considerably improves the speed, quality, effectiveness of functions and services and helps to manage physical and financial resources of a library. OSS is community-driven and its development is collaborative. They have an enhanced participation of user community in development. They can be downloaded without cost. Libraries are using open source applications for various information-handling activities such as Digital Library, Institutional Repository, Integrated Library Systems, Content Management, and E-Learning etc. Adopting the right software for a library according to their local requirement is a

serious and challenging task for library managers. Selected software should be most suited to perform the needs and operations of that particular library. It is quite difficult to have software to meet the present and future demands and challenges of a library system.

OSS is gaining immense importance in libraries especially as an ILS for library automation representing a cost effective solution. For libraries from developing countries where the budgetary restrictions hinder providing quality information services, OSILS is an apt choice. When we observe the Indian libraries, we can see that even after the emergence of numerous OSILS, most are remaining un-automated due to lack of funds and among those automated majority continue with their expensive commercial software which are costly for purchase and installation as well as for maintenance of legacy data. Many libraries could not identify an OSILS suitable for them and are still comparing the features and functionalities of different OSILS to reach a conclusion. Some libraries are still waiting for the result of using OSILS by other organizations. Libraries need to be capable of researching the existing software and evaluating the features and functionalities of the software in comparison using its community participation. Keeping in view the advantages of OSILS, careful planning can help the professionals to successfully accomplish the adoption of right OSILS in their library.

## Chapter 2

# REVIEW OF LITERATURE

### 2.1. Introduction

There are many studies on library automation at international and national levels. But all these studies were done decades back and have become technologically not very helpful for the present day because of the fast growing development in the concerned area. The developments that occurred during the last two decades were tremendous and Information and Communication Technology (ICT) has brought about great changes in way of functioning and incorporating technological applications in information handling, which was still at infancy in the beginning of nineties. Most of earlier studies dealt with the then technologies, which are obsolete in the present scenario. At present, there are more than seventy software solutions for Integrated Library System (ILS) used in Indian libraries. But all of them are highly priced packages. Now numerous Open Source Software (OSS) packages for Integrated Library System (ILS) have become available from national and international organizations. OSS movement has now evolved into a sophisticated movement that has given us some of the more stable and widely used open software packages for ILS ever produced. So a study comparatively evaluating present technologies available is essential for decision makers in the domain of Library and Information Science for automating their libraries.

In this chapter an attempt is being made to review the literatures available on automation of libraries, growth and development of automation systems in Indian libraries; OSS concept, growth and application of open source movement in Indian libraries; ILS in both open and commercial streams and the evaluation of Open Source Integrated Library Systems (OSILS) in international libraries in other countries in general and within India in detail; adaptation or migration of libraries to OSILS, case studies, performance evaluation, perceptions of library community towards OSILS in India and abroad.

Rate of technological advancement is tremendous for the last two decades in all the fields and libraries are no exception. Adopting new technologies are inevitable for library activities to sustain in the ICT environment. More and more traditional/manual technologies are becoming obsolete or improved with the introduction of sophisticated computer technologies especially in the OSS. Libraries need to adopt open source technologies to overcome the basic challenges such as budget constraints, increasing demand and user expectations etc. to improve and provide quality services. Implementation and exploration of OSS in library environment has vast scope to provide quality services.

There has been an increasing interest among the Indian library professionals in the adoption of OSILS over the past decade. The available literature reveals that the emergence of OSS for ILSs has made significant changes, both physically and in terms of service applications, to the libraries. It is a long process to adopt OSS or migrate their existing software to OSS to provide integrated library services to achieve effectiveness and efficiency. Migrating to an OSILS alleviate the library professionals without giving up any functionality of whichever software, they are using. There are many studies conducted on different aspects and functionalities to compare various ILSs. There are more than twenty five ILSs in OSS, of both domestic and foreign origin that can be implemented in libraries according to their needs. Libraries started experimenting with OSS when the first OSS was introduced more than a decade ago. If availability of under specialized services or technical issues necessitates migration to a new ILS, open source is a viable alternative to proprietary vendors (Pruett and Choi, 2013)

Relevant literatures for this study were collected from resources available in open source access mode through search engines, web pages for OSS, open access journals directory, Emerald and Institute of Electrical and Electronics Engineers (IEEE) databases and the journals subscribed by individual libraries within and out of the country through personal contacts.

## **2.2. Open Source Software (OSS)**

The concept of Open Source Software (OSS) has a long history. OSS is defined and viewed in a variety of ways. Open Source first evolved during 1970 s when Richard

Stallman, an American Software developer thought of the concept of sharing source code of the software to have more freedom. In a general study entitled *The rain forest and the rock garden: the economic impacts of open source software*, Forge examined the economic significance of the OSS industry and the need for different industry structure for Europe in terms of its role and power and reviewed the economic impacts of the trend to OSS and its balancing effects (Forge, 2006). Forge states that compared to the proprietary package, OSS provides new business opportunities in services and support which are more valuable for both user and service provider due to the availability of source code with them. Findings of Forge's study emphasized the need for investment, education and encouragement in OSS, by both the public and private sectors; to build a strong knowledge based society in Europe.

According to Amollo, as stated in the paper *Feasibility of adaptation of open source ILS for libraries in Kenya: a practical evaluation*, despite its fast growth and penetration in all sectors, it has been noted that OSS is yet to find its optimal place in libraries, particularly libraries in the developing countries (Amollo, 2013).

Selection and implementation of an ILS to computerize and manage its housekeeping operations and to provide effective service is a challenge that lies on the shoulders of librarians. In the paper *How to evaluate and purchase an ILS*, Salter states that functionality and flexibility are key elements in a successful ILS. However an ILS is a complex, multi-module beast, making it exceedingly difficult to distinguish between one ILS and another (Salter, 2003). From 50,000 feet, they all look alike. Selection of a suitable OSILS deeply affects the successful day to day automated functions and services of any library. The main pre-requisite for selection of most prevalent ILS is to have a basic assessment of the functions and capabilities of the software, which satisfies all the requirements of that specific library. Today there are many OSILSs available for library automation that are equal to their commercial alternatives. OSILS does not mean free in all respects and it requires some sort of investment and support, which attracts some kind of financial involvement. However OSS facilitates altering of its source code to have better version or to make improvements according to the wish of users or programmers.



### **2.3. Open Source Software for Integrated Library Systems**

The volume of literature on OSS and OSILS and its applications is increasing in library settings in both national and international level as the libraries are increasingly adopting the software for their automation. Literature includes case studies, personal experiences, scholarly communications on selection and implementations etc.

#### **2.3.1. International Scenario**

The impact of OSILS has had a significant effect on international libraries. In the paper 'Major open source ILS products' Breeding states that United States and Canada provide a more favorable climate for OSILS than other regions, and the philosophical preference for OSS is stronger in this region (Breeding, 2008b).

Chawner's article on *Free/Open source software: New opportunities, new challenges* discusses the concepts of OSS, its comparison with free software, current status and the potential benefits and issues associated with using free/open source software (FOSS) in library and information management (Chawner, 2004). Author states that Koha has the widest range of communication channels because the software is the most complex, with more core modules and a wider range of functionalities. The factors associated with the successful adoption of free/open source applications include the match with an organization's culture, technical infrastructure, staff skills, software functionality, and the extent of community support available. Chawner concludes that organizations adopting FOSS would need to provide their staff with additional development and training to enable them to take on these new roles effectively, and would need to have a long-term commitment to the projects.

Buchanan and Krasnoff in their paper on *Can open source software save school libraries time and money* compares the benefits and drawbacks of using both open source and proprietary software for library automation. (Buchanan and Krasnoff, 2005). They assume that OSS might be more difficult to install and configure, troubleshoot or upgrade and suggest that if schools can find free, accessible help on e-mail lists and websites and can build relationship with other users, they would be able to save money. Buchanan and

Krasnoff also suggest that the adoption of OSILS like Koha and OpenBiblio are attractive options for school libraries to make library automation less expensive, more flexible, responsive and reliable.

Chalon and et al in their article on *Open your mind! Selecting and implementing an integrated library system: The open-source opportunity* share their experiences and challenges confronted in testing, selecting and installing a suitable OSILS at 'the Belgian Health Care Knowledge Centre'. (Chalon and et al, 2006) Chalon and his team selected PMB as the suitable OSILS solution based on the selection criteria followed such as maturity, language, operating systems, assistance or support, user interface and the installation process. The study appreciates the efforts of the open-source community, which facilitates libraries to acquire an ILS at no license cost, and the savings can hence be used for the extension of the collection.

Jaffe and Careaga in their paper on *Standing up for open source* discusses use of OSILS in libraries, its background, features, advantages, hurdles to open source and other open source applications in use with numerous examples. (Jaffe and Careaga, 2007) They opine that OSILS offer many functional and practical advantages, including potential answers to some of the issues currently frustrating libraries. They claim that Koha is the most successful among the OSILS packages. The study found that lacking experience with open source tools, continued reliance on proprietary ILS, low adoption of OSILS, organizational change etc. affect the visibility of OSILS in libraries and points out that without fundamental changes in our ability to innovate, or even respond to innovation, libraries risk becoming even more marginal.

Riewe in his Master's theses *Survey of open source integrated library systems* evaluates libraries using large OSILSs, Koha and Evergreen, as well as other proprietary packages to find out the reasons for their selecting open source packages, their cost effectiveness, the other factors that influence the selection and priority given to different aspects (Riewe, 2008). He considers adoption of Koha in libraries as a system for collaborative development and analyses ILS in terms of initial and perpetual costs, and in terms of materials and labor, ease of use, need for technical expertise, customizability, portability, security, licensing fees and copyright restrictions. The study found that the main

reasons for choosing an ILS package is its affordability, scalability, and functionality and that those who decided against Koha did that due to its complexity and difficulties for installation. Libraries using OSILSs reported overall satisfaction than those using proprietary packages. The findings suggest that OSILSs need smoother installation interface, user friendly front end and better documentation.

Bissels paper on *Implementation of an open source library management system: Experiences with Koha 3.0 at the Royal London Homoeopathic Hospital* depicts motivation behind the selection and the criteria for implementation of Koha 3.0 ILS at the Complementary and Alternative Medicine Library and Information Service (CAMLIS), Royal London Homoeopathic Hospital (Bissels, 2008). He states that poor support, limited flexibility, lack of interest in new developments, as well as the high cost of the initial implementation, annual license and support charges etc are the general reasons why people migrate from commercial to OSS . The study found that Koha fulfils the library automation needs of a specialized medical institution. The study found that Koha was selected because the GNU license (open source) was considered more future-proof than proprietary products and more open to customization to meet the special needs of the library and concludes with the statement that the package is a truly future-proof OSILS.

Breeding's paper on *Major open source ILS products* explains history, back ground and the development stages of four major OSILS namely Koha, Evergreen, OPALIS and NewGenLib in detail (Breeding, 2008b). He also discusses the current market profiles, trends in OSILS adoption among them along with a list of selected libraries moving towards them. Detailed information on licensing and distribution, products, companies and technology components, standards and general features and functionality and the sources of information on functionality, supported standards of each software etc. are explained. The study has evaluated in detail different aspects like functionality checklists of online catalogue, circulation, cataloguing, acquisitions and serial controls of the software.

Breeding's study on *Open source library automation: Overview and perspective* focuses on open source issues specifically relating to integrated library systems and also provide information about OSS and its use in other domains (Breeding, 2008a). Discusses the common open source infrastructure components, and major open source principles. The

study found that libraries are moving away from proprietary ILS in favor of OSS and also that, whether a library uses an OSILS or a proprietary system, most of them use OSS in other parts of its computing environment.

Clark in his study on *The Internet connection: Open source library software ready for prime time?* identified Koha as an OSILS which is gaining corresponding increase in interest among public, school and special libraries in the US and Canada (Clark, 2008).

Hyman and Walker in their case study on *The Evergreen open source integrated library system; Its origins and significant implementations in the USA and Canada* explain the origin of Evergreen software in Georgia and British Columbia.(Hyman and Walker, 2008) The study found that Evergreen is stable, even under extreme load; robust and capable of handling a high volume of transactions and simultaneous users; flexible to accommodate the varied needs of libraries; secure to protect patrons' privacy and data; and user-friendly to facilitate patron and staff use of the system.

Johnson in her article on *Reducing resistance to the adoption of open source systems* examines the background and psychology of the open source movement, its principles, benefits in terms of usability and responsiveness to users' needs, and drawbacks (Johnson, 2008). She also explains reasons for adoption, the problems with adopting open source with a case study of Government of the State of Massachusetts. Johnson concludes that implementing OSILS and other open source applications help libraries maintain relevance with patrons and avoid being hamstrung by vendors.

Travis in her editorial entitled *Editor's desktop* in Bulletin of the American Society for Information Science and Technology pointed out that OSILS systems are still young relative to the long-established commercial systems, but their functional capabilities and their established base are growing (Travis, 2009).

Zou and Liu in their paper on *Chinese localisation of evergreen: An open source integrated library system* investigates various issues and its solutions related to Chinese language localisation such as encoding, indexing, searching, and sorting in Evergreen OSILS. (Zou and Liu, 2009) These and similar issues according to the study is to be tackled

not only language by language, but locale by locale. Authors concluded that Unicode eases many of the problems of handling different languages, and there by partially solves the problems associated with localisation. They opined that different languages and locales will need to be addressed differently in a system, especially in an entire ILS and having another language version of an ILS does not simply require the translation from one language to another.

Dykhuis in his paper on *Michigan Evergreen: Implementing a shared open source integrated library system* examines the migration activities performed in seven Michigan Public libraries with the Evergreen OSILS under the project Michigan Evergreen (Dykhuis, 2009). He also discusses the reasons for implementing Evergreen Software in all the participating libraries and the challenges faced throughout the process. The study examines the features of Evergreen software compared to other products in regard to advanced search functions, ease of implementation and ability to customize. The study opines that Evergreen facilitates migration to a feature-rich high end automation system for libraries.

Wallis and Kroski in their paper *The next generation OPAC in academic libraries* explains the importance of adopting OSILS to enhance and enrich the next generation user experience in using web based OPAC systems in academic libraries by integrating with existing ILS systems (Wallis and Kroski, 2009). He also highlights features of Evergreen, Koha and OPALS which have been developed to replace a library's entire proprietary ILS where as OSS programs like VuFind and Blacklight have been designed to work in conjunction with any vendor ILS and to assist in reengineering the library's searching tools. Wallis and Kroski assess that lack of support of the library OPAC and inability to make the changes quickly are the reasons why libraries choose OSILS since it gives full control in the look, functionality, and design of the public interface than proprietary solutions. He suggests, since no library software applications are perfect, libraries might benefit from leveraging some of the OSS tools that are becoming more available, more common with a growing user community.

Rafiq in his study on *LIS community's perceptions towards open source software adoption in libraries* measures opinion of professionals on OSILS adoption in libraries

(Rafiq, 2009). The study finds that type of organization or library is insignificant factor, but country type is significant because the LIS Community from developed countries had serious difference in perceptions towards OSILS in comparison with the community from developing countries. The study found that library professionals had positive perceptions to OSS but adoption is still at beginning and suggests that OSILS can be a great alternative to the costly proprietary software for library automation.

Rafiq and Ameen in their article on *Issues and lessons learned in open source software adoption in Pakistani libraries* identifies and discusses key issues related to the adoption of OSILS in Pakistani libraries (Rafiq and Ameen, 2009). They found that adoption of OSILS in libraries is just at a beginning stage in Pakistan, and only a few organizations have so far made their first move in this direction. The study found that 60 percent of respondents to their survey mentioned lack of budget (finance) as their number one problem in library automation. Therefore, OSILS can be an alternative for library automation in Pakistan. The major identified issues affecting OSILS adoption in Pakistani libraries are: social (cultural) disparity, conceptual confusions, digital divide, lack of technological, financial, and human development. The study recommends that OSILS applications require both LIS and IT skill set and this issue can be addressed with the induction of IT professionals in libraries and by introducing the open source concept on a wider scale among LIS professionals in Pakistan. The study recommends solving the issue of technical support by a collaborative approach.

Colford on *Explaining free and open source software* describes the basic concept of OSS and how the process of using FOSS enables users also to contribute (Colford, 2009). He goes on to outline how OSS is all around us in our daily computing lives and lists out the nine most widely used licenses. Author says many systems librarians around the world find user group listservs much more illuminating about how an application works than vendor-supplied documentation or training and they spend a large amount of time writing scripts, developing external applications or finding unintended creative uses for application features. The study suggests that there are hundreds of library applications in development, though it is advantageous to choose a project with an active development community.

Schneider's paper on *The thick of the fray: Open source software in libraries in the first decade of this century* gives an abstractive analysis of OSILS, reasons for the adoption of OSILS in libraries, its advantages and challenges compared to its proprietary counterparts (Schneider, 2009). Also lists out some of the more popular OSILS projects namely Evergreen, Koha, OPALS in libraries. The study found that awareness of OSILS as a potentially viable approach for library technology is much more widespread and growing. It says libraries are reengaging with software development projects and library community is developing dozens of library projects and good quality documentation covering all functionalities is essential to the success of open source.

Breeding's paper on *The viability of open source ILS* provides a balanced comparison between OSILS and closed source software ILSs (Breeding, 2009). It is a survey of the current landscape, which considers OSILS viability from four perspectives including market acceptance, support options, product development and functionality and risk factors. It compares the type of libraries selecting OSILS in the United States and also found that Koha, OPALS and Evergreen are found to be the three OSILS products that dominate in United States and Canada. However Koha finds use in libraries worldwide. The study concludes that although there is an increased acceptance of OSILS products, the market for proprietary ILS remains strong, especially for larger libraries and the adoption of OSILS in the United States and Canada is at a higher level than in other regions of the globe.

Molyneux in his case study on *Evergreen in context* discusses the history, design architecture, technology, interface, software architecture and the development philosophy of Evergreen OSILS software and it is a good example of the open source adage "scratching an itch" (Molyneux, 2009). The study observed that Koha and Evergreen are the two largest OSILS running in the United States and hopes that Evergreen software would be coming with many other essential modules, which are missing in the existing version of the software.

Krichel's paper on *From open source to open libraries* expands the idea of open source software to include open data and open libraries (Krichel, 2009). Krichel compares the software services and library services in terms of its interface element, component or

code or description and the objects. He also highlights the direct correlations between the functions of libraries and the characteristics of OSS, how the principles of OSS can be applied to the distribution of "open libraries" as a future direction for librarianship, obstacles to achieve open libraries and the implications of OSS for the library community. The study also opines that building open libraries requires technical skill, business sense and a change in purpose that they are slow to accept because many of the principles of librarianship are embodied in the principles of OSS and in a number of ways, librarianship and OSS software go hand-in-hand.

Petrich's paper on *Lessons from the bazaar: Open source software use and development in libraries* evaluates the impact of OSS and the importance of open source communities for libraries (Petrich, 2009). The study opines that academic libraries are able to lead the way in implementing new technologies and processes and the academic culture is more likely to encourage staff education and experimentation. It suggests that participating in OSS communities can educate library staff in the practical skills needed to develop in-house OSILS and the advantages of contributing to an open source community are: improved support when needed, improved knowledge of the product, and an improved community. Failing to participate creates a risk to the library of losing sight of the project direction that may ultimately make the product unsuitable. The study concludes that libraries with technical resources, developing and sharing new software applications ease the way to demonstrate leadership in the library community.

Trainor's study on *Open source, crowd source: Harnessing the power of the people behind our libraries* provide an insight into OSS, its advantages, OSILS and the new developments and also the use of Web 2.0 and Library 2.0 technologies to combine OSS with user-generated content to create a richer discovery experience for their users (Trainor, 2009). Trainor found that OSILSs and some vendor products outside the traditional ILS market allow libraries to pool data created by users: tags, reviews, comments. This allows the smallest libraries to harvest richer data than those of their own communities.

Walls's study on *Migrating from innovative interfaces' Millennium to Koha : The NYU Health Sciences libraries experiences* explains the circumstances, methods, challenges and difficulties encountered during the transition of the New York Health



Science Libraries ILS Millennium to OSILS package Koha (Walls, 2011). It compares the functionalities of Koha and Millennium and the advantages of using Koha and the experiences of improving the software modules of Koha such as electronic resources management module, course reserves, cataloguing interface etc and claims that these changes made Koha a better ILS for libraries worldwide. Also suggests the factors to be considered before going for migration to OSILS platform mainly the strength of the software community and its ability to perform all the essential functions in a library.

Tajoli in his paper on *OSS diffusion in Italian libraries : The case of Koha by the Consorzio Interuniversitario Lombardo per l'Elaborazione Automatica (CILEA)* describes the main features and functions of Koha software and its specific characteristics of modules like cataloguing, circulation, acquisition, serials, report module and web 2.0 OPAC (Tajoli and et al, 2011). They explain the major contributions of CILEA, an Italian consortium of universities to give ITC support to universities and public administration in Italy, to Koha software, in particular on its work on Italian translation, writing a correct default configuration and the translation of UNIMARC for Italian libraries to use in the configuration along with bug fixing documentation on MySQL in Italian language. Tajoli suggests Koha is suitable for all type of institutions intending to automate their libraries because it has all the standard modules of a modern ILS. The study reveals that the documentation in own language helps people to understand how data are organized and help developers to find and correct Koha's bugs and problems easily.

Yang and Hofmann's paper *The next generation library catalog: A comparative study of the OPACs of Koha, Evergreen, and Voyager* compares the next generation features of OPACs of Koha and Evergreen with a proprietary software, Voyager based on the presence of ten features- Single point of entry to all library information, State-of-the-art Web interface, Enriched content, Faceted navigation, Simple keyword search box, Relevancy, Did you mean..?(Spell checker), Recommendations and related materials, User contribution and RSS feeds (Yang and Hofmann, 2010). The comparative evaluation found that among the OSILS packages OPAC of Koha is more advanced and innovative than Evergreen and Voyager and OPAC of OS is more ideal for next generation catalogue than commercial software.

Helling in his case study on *Cutting the proprietary cord: A case study of one Library's decision to migrate to an open source ILS* explains the migration experience of the Bloomfield-Eastern Greene County Public Library, Indiana, USA from SIRSI, a proprietary ILS, to Koha to Evergreen (Helling, 2010). Study also discussed the history and implementation problems of both Koha and Evergreen OSILS packages and their current use as well as their future directions of development and opportunities. The library found Evergreen to be much more robust, stable and reliable than Koha among OSILS in terms of its technical support received from the service providers and their particular consortia perspective and justified that the stability and reliability of the library had greatly increased by the adoption of Evergreen.

Allie's proposal for choosing the best ILS in *Integrated library system proposal* reviews three systems, such as Koha, Millennium and Symphony is based on the capabilities of meeting the needs of both users and the staff of a large public library system (Allie, 2010). It is an important study in regard to application of OSILS in large library systems.

Singh's proposal on *Comparison of technical support for open source software versus proprietary software* identifies the differences in the capabilities of OSILS packages and proprietary software for ILS with respect to the availability of technical support and the expectations of librarians to provide in-depth evidence and research-based guidelines since it appears to be a key challenge for the librarians who want to adopt OSILS landscape, or who just want to evaluate the feasibility of OSILS for their libraries (Singh, 2010). The study also assessed the satisfaction levels of librarians with the ILS that they have adopted.

De Smet in his study *Some ISIS-software history and technical background on the new FOSS integrated library system ABCD* gives a general overview of the origin and specific technological concepts of the ISIS software packages with a special attention on the relevance and technological concepts of ABCD one of the latest entry to OSILS (De Smet, 2010). The software represents the integration of many ISIS tools, e.g. the meta-search capability, the CMS-based library "portal", advanced serials management and the advanced circulation module, which allows linking to non-ISIS user databases and multiple loans policy implementations and it is best presented as a 'suite' of cooperating but also

independent software packages. He claims that the 'central' module enables smaller libraries with insufficient technological skills to fully automate their library without leaving the familiar ISIS environment and the software is brought to bear in modern database-driven web applications. De Smet concludes that ABCD brings a hopefully welcome solution and continuation for the many existing ISIS users all over the world and hopes that it will attract renewed interest from young, modern librarians who are open to alternatives for the commercial ILS providers who are by (economical) necessity making their globalised users' market more dependent rather than more self-supporting and self-empowered.

Longwell's paper on *Coming soon to a library near you: An open source ILS* explains the experiences of migrating from current ILS to the Evergreen OSILS at the Sage Library System of Eastern Oregon (Longwell, 2010). It explains how this alternative to proprietary software benefits their libraries and its advantages. Longwell found that despite tremendous development strides since its introduction in 2006, Evergreen still fell short in the areas of acquisitions, serials and limited functionality of the catalogue editor. The study traced out the advantages of OSILS such as access to and control over data, availability of new features at no additional cost, bookings, rotating collections, enhanced OPAC content etc. and depicts the importance of training as a key factor in the successful transition from one ILS to another.

Dimant's paper on *Breaking the barriers: The role of support companies in making open source a reality* discusses the current state of the library automation market in UK and the role of open source support companies (Dimant, 2010). It shares his experience in using OSS and the benefit of using Koha and Evergreen in libraries and found that increasing number of libraries are migrating from the major proprietary vendors to both Evergreen and Koha in both North America and Europe. The study found that UK is currently lagging far behind many other countries in the take-up of OSILSs due to the lack of in-house expertise and time resource available to implement the solution. The study found that Evergreen was designed from the ground up as a consortia system and is particularly suitable for large or complex installations whereas Koha, though it too has some larger installations, is more suited to the small- and medium-sized libraries. The finding of the study is that using OSS, Libraries can gain user-driven state-of-the art

technology at a lower price and regain autonomy and extend the possibilities for collaboration.

Lochhaas and Moore in their website content on *Open source software libraries* explains the background, reasons to use OSS and its incorporation with libraries (Lochhaas and Moore, 2010). The study also highlights tips for implementation and evaluation along with the details of libraries using OSILS and opines that library can save money by using OSS, which requires no licensing fees and can be used with refurbishing older computers instead of continually buying new computers every few years.

Foote in his research article on *The myth of free: The hidden costs of open source software* assess the costs of choosing an OSILS over a proprietary ILS (Foote, 2010). Author found that human costs, time costs and monetary cost on paid staff, server etc are the hidden costs associated with the creation or adoption of an OSILS. Author concludes that libraries must be prepared to absorb the costs of paid staff time, the possibility of needing to pay for outside help, or the possibility that specialized features may require additional server space. Then they must be prepared to share innovations and help other users solve problems, in order for the software to achieve its true potential.

Asemi and et al in their paper entitled *A survey on the library open source software in the University of Isfahan, Iran: Viewpoint of Librarians* gives an overview of history of OSS and introduce some types of Iranian library software packages used by different libraries in Iran (Asemi and et al, 2010). Also it reviews target features, facilities, and OSILS applications in libraries with special reference to evaluation of University of Isfahan Libraries Open Source Software (UILOSS). The study concludes that the software has good level of reliability and flexibility, but its safety and extensibility isn't at a good level. Software has major weaknesses in circulation, OPAC, Cataloguing and Classification sections and there are no periodicals and acquisition modules, which dissatisfy the needs of libraries.

Vasupongayya and et al in their study *Open source library management system software* selected OSILS packages as an alternative solution for libraries which are not able to afford the commercial products available in the market, based on their abilities to

perform four basic components such as traditional services, interlibrary loan management, managing electronic materials and basic common management system such as security, alert systems and statistical reports (Vasupongayya and et al., 2011). The conclusion drawn at the end of the study suggested that only Koha, PMB and NewGenLib provide strong support for all traditional services whereas they have a partial support on management of electronic documents. Also it highlighted the differentials in capability of inter library loan management facility of software such as Koha, PMB, Evergreen, NewGenLib, OpenBiblio ILS and DSpace. The study recommends focusing on two important factors while selecting an OSILS package, the availability of supporting documentation and an active community.

Pratheepan in his paper on *Integrated library management systems (ILMS) - open source and commercial software: An assessment of the merits and demerits* compares the perception, merits and demerits of OSILS such as Koha, Evergreen, NewGenLib with commercial library management systems such as LibSys, Voyager and SOUL (Pratheepan, 2012). Also explains the successive generations of emergence of ILMS and its strength and challenges. The study analyses and evaluates both proprietary and commercial ILMS in their business, development, licensing and technical perspectives and suggest that the implementation of any ILMS in an University environment should be on the basis of the pros and cons of the system analyzed and evaluated.

Muller in his research paper, *How to choose a free and open source integrated library system'* selects twenty free/OSILSs to identify the strength, weakness and the suitability of OSILS to meet the needs of each libraries and analyzes only three software, such as Koha, Evergreen and PMB, based on software licensing, agreements, community, and functionalities for large libraries (Muller, 2011). The study opines that though Koha is the only ILS to consider when selecting OSILS, software such as Evergreen and PMB products should also be taken into account even though they lack matured functionalities. The finding is that these three ILS can not only meet the needs of libraries, but they remain alternatives that library decision makers must seriously consider.

Espiau-Bechetoille and et.al in their research paper *An example of inter-University cooperation for implementing Koha in libraries: collective approach and institutional needs* explains the experiences of three university libraries (Rhône-Alpes, France) in

changing their proprietary software for the OSILS package Koha with particular focus on how they organized themselves to pool their technical skills, human resources and costs (Espiau-Bechetoille and et.al, 2011). They suggest that cooperation among the libraries facilitates to acquire knowledge and expertise and to minimize costs while adopting an OSILS. Cooperation among the libraries for adoption of OSILS includes -Identification of the Software, Comparison of their features and technologies, fund sharing for development costs and training programs, expressing the specifications to improve the software and the testing of various functions of the software. The study also states that a university's switch to open source solutions depends on both in-house and company know-how.

Dennison in his paper on *Small and open source: Decisions and implementation of an open source integrated library system in a small private college* explains the initiation, experiences and the difficulties faced during the process of migration from a proprietary ILS to Koha, an OSILS at 'The Paine College Collins-Callaway Library' Augusta in detail (Dennison, 2011). The complexity, difficulty in managing, increase in annual costs of the license and maintenance contract and the limited budget to handle the upgrades or new features are the main reasons for migration. Paper compares the features of Koha software with the proprietary software and opines Koha as the best OSILS because of its track records, international implementation, awards, options for being hosted and easily accessible options. The study conveys the message of choosing an OSILS for a library and its advantages for significant annual savings, which can be used for purchasing more library resources. The study specially notes that Koha has improved online catalogue module also.

Wale in his paper *Cloudy with a chance of open source : Open source integrated library systems and cloud computing in academic law libraries* indicates that law libraries are migrating from proprietary to OSILS due to its incapability in providing flexibility and adaptability necessary to keep pace with advances in technology in view of cloud computing aspects (Wale, 2011). Also compares the advantages and disadvantages of both proprietary ILS and OSILS, factors that should be considered when deciding whether to maintain a proprietary ILS or implement an OSILS and various issues to be considered when contemplating a move to cloud computing.

Jones and Cynthia Ng in their study *Comparing open source integrated library systems: The circulation module of Evergreen & Koha* evaluate and compare the circulation module of Koha (Bywaters version 3.03) and Evergreen (version 1.6.1.2) through the staff client and the Online Public Access Catalogue (OPAC) (Jones and Cynthia Ng, 2011). The study found that Koha's interface is friendlier and more streamlined than that of Evergreen. However Evergreen provides more flexibility and functionality for consortia, superior documentation, and many other features though available in both systems, were designed better than in Koha. The paper suggests that though both the systems are very comparable, libraries that belong to consortia may decide that Evergreen is the better option among OSILS for them and Special libraries and stand-alone branches might prefer to opt for Koha. The study opines that ultimately, the better choice depends on the needs and requirements of the organization.

Farkas's paper *Technology in practice: Open source, open mind* evaluates OSS against proprietary software, its continuity, documentation, community, support (Farkas, 2011). The paper states that some OSILS projects, like Koha, have a strong community of open source developers who are improving the code for their libraries and are then contributing that code back to the community. It suggests that libraries should choose the best tool for the job based on their specific requirements and limitations instead of choosing software solely for philosophical reasons.

Keast in his study on *A survey of Koha in Australian special libraries: Open source brings new opportunities to the outback* examined the adoption of Koha software amongst Australian special libraries through a survey and found that the main reasons for conversion to OSILS like Koha were practical economic grounds, coupled with dissatisfaction with conventional library systems (Keast, 2011). Author also conveyed that the libraries found the conversion to Koha reasonably trouble-free and the satisfaction ratings on most aspects of Koha's performance were "above average" to "good" and that it realised the library expectations of value for money and overall cost savings.

The research paper of Kiriyanant *Survey of open source integrated library system in Thai University libraries in Bangkok and Pathumthani* surveys the movement of Thai university libraries in Bangkok and Pathumthani towards library automation by adopting

OSILS (Kiriyanant, 2012). Online questionnaire method is used to measure the satisfaction level of the respondents with the existing ILS, their opinion about OSILS and their attitude towards choosing OSILS for their library. Though the survey found that majority of the respondents used commercial / proprietary or in-house developed ILS for library automation an equal number of respondents want to change because of reasons like lack of updates and maintenance, delay in solving system problems, compulsion to adopt new release etc. from the vendors and also to save the expenses to become more self-sustaining. Thirty percent of the respondents did not want to change the current ILS because a) there will be difficulties in migrating to new system, b) the current ILS has continued development c) the current ILS is easy to use d) the current ILS is quite stable, flexible and is continuously maintained and e) there will be high risk. The survey also revealed that majority of the respondents knew and chose to adopt OSILS, and Koha is the preferred package they wanted to change to and found that 59.2% of Thai university libraries in Bangkok and Pathumthani tended to move towards the adoption of OSILS although they currently used commercial / proprietary ILS.

Egunjobi and Awoyemi in their paper on *Library automation with Koha* shares the success story of library automation in Adeyemi College of Education, Nigeria with the OSILS package Koha and explains the automation process, challenges faced during the process such as lack of competence in computer skills of the library staff, erratic power supply during the automation processes and the improvements in the operations and services of the library after the automation (Egunjobi and Awoyemi, 2012). Study highlights the major reasons for the adoption of Koha software including it's free, user friendliness, possibility of log-ins at different times and places, rich user community and also the good reputation of the software developer. The paper conducted a survey to evaluate the performance as well as users satisfaction of the system after its installation and found that all respondents are familiar with the major system modules and Koha satisfies majority of the users. The study recommends that library automation enhances the operations and services of the library and improves the library's relevance to the academic community and suggests the library professionals to use OSILS and to adopt the changes ICT brought to the profession to provide the need based services and highlights the need for computer literacy among the professionals.



Rossi and et al in their research paper on *Adoption of Free/Libre open source software in public organizations: Factors of impact* investigates the importance of factors for the adoption of free/libre open source software (FLOSS) in the public sector and evaluates how different factors impact during the initiation and implementation phases of the adoption process (Rossi and et al., 2012). The study ascertained that a strong and decision-centric management board, strong governmental support and the environmental factors increase the adoption of OSILS at the public level and continuous employees' training, organizational objectives consensus, and business process reengineering are found to be important for the implementation phase.

Rehman and et al in *Free and open source software movement in LIS profession in Pakistan* explore the current status of Free and OSS movement and the efforts made by the individuals or LIS organizations to promote the software and the hurdles involved in it in Pakistan (Rehman and et al, 2012). The study found that capacity building of library professionals for the adoption of the OSILS package is very important. Seminars, trainings, workshops and talks, software development, research activities etc. can play a very important role for the promotion of OSILS movement in Pakistan. The study suggests that FOSS can be an alternative for library automation in libraries of Pakistan and efforts for the promotion of OSILS should be acknowledged by library professionals to make this movement successful so that an OSILS alternative to commercial software may be available for every library having low budget.

Wang and Dawes in their article on *The next generation integrated library system: A promise fulfilled?* describes the features needed in a next-generation library system (Wang and Dawes, 2012). Also, explains in detail that comprehensive library resources management system based on service-oriented architecture that meet the challenge of the new library workflow and next-generation discovery layer as the distinguishing characteristics of next-generation ILS. Authors concluded with the statement that in both the commercial and OSILS arenas concrete steps are being taken to develop next-generation library systems that will manage all library resources.

Angela Repanvici's article on *Library automation using open source software: Project application in Romanian environment* discussed the experiences of successful

implementation of Koha OSILS in seven school libraries in Brasov, Romania (Repanovici, 2012). The author found that Koha OSILS is the best software to automate group of school libraries and also found that MARC21 framework of Koha software allows selecting the fields necessary to generate reports that are useful to each branch of the school.

Amollo in his investigation on *Feasibility of adaptation of open source ILS for libraries in Kenya: A practical evaluation* found that the majority of academic, public and research libraries in Kenya depend on commercial or locally developed systems due to lack of knowledge (or interest) in OSS alternatives and lack of sufficient technical expertise to support OSILS projects (Amollo, 2013). While there are quite a number of libraries and librarians worldwide who have shown a great interest in OSILS, only few library administrators have actually implemented them. Koha seem to have more users compared to the rest. Among automated libraries 28.5 per cent of the overall systems installed regardless of type (open, closed or custom made) and also 67 per cent of the respondents have either worked with or are familiar with Koha. Author also states that cost, features and functionalities are found to be the main considerations for the libraries when selecting software for library processes or functions.

Macan and et al in their paper on *Open source solutions for libraries: ABCD vs. Koha* gives a general overview of Koha and ABCD and compares its functionalities and characteristics especially on 'next generation catalogue' characteristics, acquisition, cataloguing, serial control, patron management, circulation, reports and statistics, administration, security etc. (Macan, and et al 2013). The study gives an overview of ILS, criteria on selection and decision process for OSILS and comments that many ILS are not effectively 'integrated'. It lists out various reasons for migration to OSILS, relative merits, disadvantages and the issues related to the implementation and maintenance of OSILS in comparison with commercial systems. Study reveals that Koha has more functionality along with advanced next generation catalogue characteristics than ABCD and comparatively it has become widely used ILS with continuous improvement in the functionalities with a wider community. ABCD is more flexible and independent of metadata as well as integrated meta-search whereas Koha supports only UNIMARC and

MARC 21. The study opines that, there is still need for further development of both Koha and ABCD.

The research study of Singh *Experiences of migrating to an open-source integrated library system* interviews and gathers the experiences of twenty librarians from different types and sizes of libraries who have worked on migration or are in the process of migration to OSILS (Singh, 2013b). The author claims that absence of consolidated resources for researching different open source integrated library systems and for sharing the experiences of the people using them to help the library professionals in problems faced while migrating or implementing OSILS and intellectual freedom, cost and the functionalities are the three common reasons for people migrating to OSILSs. Based on the study apart from the adoption plan and requirements for the adoption process an information portal that contains resources to help librarians in each phase of the processes of open source ILS adoption was also developed.

Dalling and Rafferty in *Open source, open minds?: An investigation into attitudes towards open source library management systems in UK higher education libraries* performed a small-scale study that investigated attitudes to OSILS in UK higher education libraries (Dalling and Rafferty, 2013). Lack of motivation to change systems, current financial climate, limited experience, need for strong commercial support etc. make the higher education librarians reluctant to choose OSILSs. The study found that UK higher education libraries rely on peer feedback when choosing an ILS and academic libraries are more conservative and slower to adopt new systems than other libraries though the study revealed enthusiasm towards the open source model. Existing functionality in proprietary systems are unsuited to the UK market, and the ability to customize OSILSs could represent an opportunity to develop systems tailored towards the sector. The study suggests that OSILSs are unlikely to be widely adopted in participants' libraries in the near future.

Pruett and Choi in their research article on *A comparison between select open source and proprietary integrated library systems* provide a comparative analysis of Evergreen and Koha (open source) with Sirsi-Dynix's Symphony and Ex Libris' Voyager (proprietary) to provide direction for library administrators considering OSILS adoption in terms of its functions, adoption and technical support, usability, and economics (Pruett and

Choi, 2013). OSILS compare favorably with proprietary ILS in its functions and usability from a librarian/developer's standpoint and concluded that Koha and Evergreen are adaptable and scalable and have well developed modules to facilitate all major work-flows for library technical services departments and provide the interface for library patrons.

Conc's paper on *Choosing free library software: Experiences of the faculty of humanities and social studies in Zagreb* surveyed the libraries in Croatia and found that free software solutions are no longer behind their commercial counterparts in terms of quality and comprehensiveness and as such, among the available free library software, the OSILS package Koha is the most competent one (Conc, 2013). The author also justified that Koha's interoperability and flexibility are the most common advantages of OSS, which gives hope for further development and successful linking with other software and services.

Singh in her research paper *The nuts and bolts of migration to open source ILS: Experiences and recommendations from the librarians* interviewed twenty librarians who have worked in libraries that migrated to OSILS or were in the process of migration and found that although libraries still encounter problems during migration such as data loss and server crashes, most agree that OSILS have a bright future, as the software is developed and librarians become more proficient with the technology (Singh, 2013a). Author suggest the libraries going for migration to OSILS to consider, developing partnership with other libraries that have already migrated to OSILS, to create a demonstration site to evaluate the system, train staff members, and determine the best set up rules and policies, to check with the community about development, to write policies before starting and have regular meetings, and to focus more on customization than routine maintenance.

Lack and et al in their article on *Increasing library usage through Free Open Source Software (FOSS) solutions: Two case studies from Zimbabwe* conducted two case studies from academic libraries in Zimbabwe namely National University of Science and Technology and University of Zimbabwe and demonstrated how librarians implemented FOSS solutions that allowed these libraries to meet patrons' needs and increased library usage (Lack and et al, 2013). The study concluded that in both cases, proprietary software was not a viable option, and so the only way of resolving these issues was to explore and

utilize FOSS solutions. That these libraries achieved such important changes in their services to users in a relatively short time (the two case studies described took place in less than 10 months) demonstrates the power of FOSS, when combined with commitment and determination, to change lives.

Palmer and Choi in their research article on *The current state of library open source software research: A descriptive literature review and classification* assessed the current state of research on OSILS in the library context by year, publication outlet, software, article and library type and topic (Palmer and Choi, 2014). The study found rise in OSS literature in the mid-to-late 2000s and a comparatively high volume of case studies on OSS during the past years. Authors also found that significant research attention devoted to open source repository applications, online public access catalogue (OPAC) software, and ILS and the majority of article types employed were case studies and discussion pieces.

Albee and Chen in their article on *Public library staff's perceived value and satisfaction of an open source library system* examine the perceived value of library staff using Evergreen software in Indiana public libraries (Albee and Chen, 2014). Authors found that OSILS package Evergreen provided more functionality than previous system used in the libraries in terms of accessing patron information and reserving materials for patrons and attracted with its ability to check the availability of library materials at other participating libraries, which improved access. Authors state that the Evergreen Indiana Consortium enabled library staff and users to search multiple library collections via the shared library catalogue thereby improving access.

Choi's research work on *The application profiles and development characteristics of library open source software projects* analyzed a large sample of OSILS projects from SourceForge and Foss4lib OSS hosting systems (Choi, 2014). Results of the study show that there has been a steady decrease in the number of OSILS projects initiated since 2009 and it exhibits several characteristics that differ from the traditional developer-oriented OSILS projects in terms of their technical environment. The reasons for such a decrease is the already available multiple OSILS projects for each software category and the emergence of Google Code OSILS hosting systems. Author also suggests that the development stage, number of developers, and number of downloads, which have been

widely employed as proxy measures for OSILS project success in OSILS research needs to be taken into account in adopting OSILS also because they were found to be positively correlated to each other and critical project success indicators. Sponsorship and availability of internal staff who are capable of collaborating with OSS communities are the other factors affecting the success of OSILS projects.

### **2.3.2. Indian Scenario**

Studies on computerization of library activities in India started during 1970s when minicomputer systems were introduced. However, the arrival of micro and personal computers during 1980s resulted in remarkable progress in library automation in India. The survey conducted by Kamath to study the current problems and trends in libraries during 1990s revealed that only nine libraries in India were using computers those days (Kamath, 1990)

Rao's research work on *Library automation: What is expected of?* discusses the areas of computerization in libraries, the objectives and functions of computerized acquisition, serials control, circulation, and cataloguing and lists out the software of Indian origin and its source for the automation of library activities (Rao, 1995). The study found that lack of trained manpower and non-availability of suitable software are the main reasons why libraries in India have not yet gone for automation in a big way. The conclusion of the study is that the success of library automation ultimately depends upon the availability of skilled manpower.

Vaishnav and Bapat in their paper on *Library automation-A feasibility study* explains the library automation program, problems in the existing system and reasons for automation at Dr Babasaheb Ambedkar Marathwada University, Aurangabad (Vaishnav and Bapat, 1995). Also points out in details, the requirement of library automation and discusses the investment, technical and social aspects of library automation. The findings of the study are that automation creates new job opportunities with higher scales and relieve the existing professional staff from their routine clerical activities to enable them to perform intellectual professional duties.

Gopinath's study on *Library automation: Change for productivity in service* examines the change in perception of library's work, functional aspects, social aspects and system dynamics of library automation (Gopinath, 1995). It suggests some strategies for library automation and concludes that the human factor provides socio-dynamics to library automation.

Rao's work on *Automation of academic libraries in India: Status, problems and future* discusses the major challenges and future of the automation in academic libraries in India (Rao, 1997). The study opines that library automation seems to be inevitable and the major challenge then onwards would be providing sufficient resources to manage and operate an automated library. The conclusion of the study is that the challenges remain same over the last two-three decades such as manpower requirements, preparation of machine-readable catalogues, free flow of funds, etc. Librarians have to overcome these challenges for successful implementation of automation.

Francis in his research work on *software problems in library automation in India* analyses the important software problems faced by the library professionals in India and points out various compatibility and suitability issues in the selection of a library software and lists out different aspects of major library software available in India (Francis, 1998). It says that these problems have affected the progress of computerization of libraries. According to the study up-to-date and detailed information on software available in India can prevent several issues that may arise in the course of computerization and an agency/mechanism to continuously evaluate the software may be formed to meet this requirement. The study concludes that a permanent platform to examine the problems related to the software will speed up the process of computerization and networking of libraries in India.

Amin's research project on *Open source software for libraries: A trend report* looks into the technologies and tools available in the open source world that can be used in improving services within the libraries (Amin, 2003). He outlines the history, features and characteristics of major OSILS products namely Koha, PhpMyLibrary, OpenBiblio,

GLIBMS, Avanti, PhpMyBibli, OpenBook, Learning Access ILS, and Karuna. The recommendation of the study is that libraries might use an ILS from one of the major vendors in combination with an open source product developed by other library or by itself in order to better meet its internal or users' requirements.

Moorthy's paper on *Library automation in India* discusses the growth of computers, development of library automation software and activities in India (Moorthy, 2004). He explains some of the software packages available in India and their features in detail along with listing the advantages of library automation. In the concluding remarks author says that automation of library activities helps in managing the library's resources in a better way at the same time saving time, money and manpower.

Reddy's paper on *Open source systems in the library and on the net* explains about the OSS in libraries, its advantages, disadvantages and challenges and gives an over view of three OSILS namely Koha, Learning Access ILS and Avanti (Reddy, 2004). The paper specifies that though the adoption of OSS is just a matter of time and the cost of implementation is substantially lower than proprietary software, libraries have to carry the burden of development themselves or turn to a commercial vendor to mould the product to their needs. The study suggests that in spite of the challenges, libraries should consider the capabilities of OSILS and evaluate their merits of their features, reliability and support.

Mukhopadhyay in *Comparative study of library management software: An Indian scenario* compares the features and facilities of different generations of ILSs and its advantages for library automation in India (Mukhopadhyay, 2005).

Koneru's paper on *Integrated library system: Selection and design* discusses the planning, decision-making issues and other factors associated with the design and development of an ILS (Koneru, 2005). Also lists out the steps to be followed in the system selection processes and procedures and suggests that design and development of an ILS should meet not only the present but also future demands and challenges. The study concludes that the library staff should undertake a system study before designing a user centred system to identify the scope of the system and the user's requirements and the



limitations and problems of the present system and should update their functional and technical skills in order to cope with the advancements in the system.

Kumar's paper on *Free/Open source integrated library management systems : Comparative analysis of Koha, PhpMyLibrary and OpenBiblio* evaluate each modules and compares the features of OSILS packages Koha, PhpMyLibrary and OpenBiblio and found that Koha satisfies all the functional requirements of a library management system. However PhpMyLibrary and OpenBiblio are suitable for libraries with small collection (Kumar, 2005). Free/OSILS have all the features of commercial systems available in the market but they have comparatively insufficient documentation.

Mukhopadhyay in his paper *Five laws and ten commandments: The open road of library automation in India* discusses the progresses of library management software over the years and explains the major features of the OSILS package Koha, the fourth generation LMS and compares it with the commercial LMSs available in India. The work observes that Koha supports almost all the required core activities of library management (Mukhopadhyay, 2006). The study also gives a detailed account of the customization of Koha for use in college and public libraries in West Bengal and its Unicode compatibility in view of the Bengali script and concludes by explaining the advantages and benefit of using OSILSs.

Kumar in his paper on *Selection and management of open source software in libraries* gives an overview of OSS movement and lists out some of the criteria to be followed while selecting an OSS, its advantages, challenges during installation and its maintenance and the need of library professionals to be involved in their development (Kumar, 2007). Kumar concludes that lack of awareness; training and encouragement from government are the primary reasons for libraries not implementing OSS for their automation which are alternative solution to costly commercial software. The study suggests that the training programmes for working information professionals, inclusion of OSILS package in library science curriculum, involvement of Government and professional organizations in designing policies etc can help to tackle the situation properly.

Randhawa's paper on *Open source software and libraries* gives a general overview of open source movement, selection criteria, advantages and the features of major OSILS packages such as Koha, NewGenLib and Evergreen (Randhawa, 2008). Author suggests Library professionals to become aware of the advantages of OSS and to be involved in their development.

Bansode and Periera in their article on *A survey of library automation in college libraries in Goa State, India* surveyed college libraries affiliated with Goa University on automation and found that majority of them use NewGenLib as their ILS and none of them were outsourcing their automation work to other agencies (Bansode and Periera, 2008). Authors also ascertained that majority of the libraries lack the staff required for automation and suggested that retrospective conversion of the documents and other similar jobs related to automation may be outsourced and library professionals must upgrade their skills in order to meet the growing expectations of users from libraries.

Dora and et al paper on *Open source movement in Indian libraries: An analytical study* gives an overview of the concept, evolution and the usage of OSILS in Indian libraries for various applications along with its advantages (Dora and et al, 2008). The paper also highlights the use and benefits of major OSILS like Koha, NewGenLib etc used in Indian Libraries and their problems and prospects. Authors found that In India, that are quite a good number of OSILS installations have been made and it indicates that there is vast scope for the future of open source movement in library in India. The study suggests that OSILS needs a well-planned direction, standard practices, appropriate policies and legislations for its growth in Indian libraries.

Kushwah and et al in their paper on *Library automation and open source solutions major shifts & practices: A comparative case study of library automation systems in India* compares the features and the problems associated with proprietary software especially Libsys and SOUL and focuses on the advantages of using Koha Open Source Software (Kushwah and et al, 2008). The study opines that high purchase and maintenance cost, addition of new version or new features, heavy charges for additions, lack of proper support from the vendors etc. are still the major problems in using proprietary software. The study found that it is a big challenge for the libraries when they select the automation product for

their library and suggest OSILS or free ware as an alternate solution against the commercial software and for the Libraries, especially with skills in ICT can adopt Koha or other OSILS and conclude that open source or open standard is the present and future.

Kamila in her paper on *Koha: How open it is?* discusses about the history, definition, and features of OSILS including, some Free Library OSS and their companion modules, their features in detail, installation procedure, functional modules, setting of system preferences and operating parameters of Koha on windows (Kamila, 2008). The study concludes that it is better to use OSILS because of its many useful features such as importing of data directly from Library of Congress and other large databases which minimizes the processing work of library, main library and branch library automation facilities, MARC21, Z39.50 etc. as well as its freedom to change the source code as and when necessary which can solve the local problems of every institution.

Biswas and Paul in *NewGenLib, the first Indian open source software: A study of its features and comparison with other softwares* highlights the origin, salient features and advantages of OSILS package NewGenLib and lists out the core features and services that needs to be available in library automation software (Biswas and Paul, 2008). The study presents a comparative evaluation of features and functions of NewGenLib with Koha OSS and the commercial software like LIBSYS, SLIM++ and Easylib, all of which are developed in India. The study found that as far as the general features are concerned NewGenLib is ahead with six more features compared to the other OSILS packages, and is again advanced than the Koha but more or less equally featured in comparison with commercial software as far as the functional modules are concerned. The NewGenLib is also more featured than all other OSILS in different considerations like features of OPAC, circulation and cataloguing and information services. The conclusion of the study is that NewGenLib software might be successful and would be applicable in Indian libraries since it supports all the functional modules as well as the web interface needed for a library. The study also stresses the need for having customized versions and continuous support from the developers end as well as continuous research from professionals on this package.

Sunil in his research paper on *Importance-Performance Analysis (IPA) of OSILS Products* evaluated the performance of selected OSILS software in Indian college libraries using Importance-Performance Analysis (IPA) technique and found that Evergreen is having moderate performance in technical processing (3.20) and OPAC (3.20); and good performance in circulation module (3.10) and revealed that the poor performance in Acquisitions (1.80) is the major drawback for the acceptance of the product (Sunil, 2011). The study strongly recommends the consideration of Koha for the automation activity in Indian college libraries with improvements in its serial control module. The author records the performance of NewGenLib in all the housekeeping modules as excellent and tuned to bring the best practice in the Indian college libraries. However, for those libraries which demand the service support and community support as key aspects for consideration of the product NewGenLib is not recommended.

Mulla and Chandrashekara in their paper on *Use of integrated library software: A survey of engineering college libraries in Karnataka* discusses the history of library automation and provides an implicit view of the professional experiences of the engineering college librarians in Karnataka computerizing their house keeping operations (Mulla and Chandrashekara, 2010). They observed that 13.73% of the libraries were not automated for reasons which varied from library to library such as lack of computer facility, financial problems, lack of trained manpower and inadequate library collection. The study opines that evaluation of each module of OSILS or other packages is an influence factor for selection of library software. The study recommends that libraries which have not automated yet should look forward and adopt OSILS packages.

Kumar and Abraham in their study *Eight things you should know about open source integrated library systems* gives an insight into the use, development, maintenance and benefits of OSILS and its significance when compared with proprietary ILS. (Kumar and Abraham, 2009). The study also explains the advanced features of popular OSILS packages like Koha, NewGenLib, PMB and Evergreen and opines that lack of awareness and knowledge in open source technology among library professionals restrict wide adoption of open source solutions. The study suggests the criteria to be followed before the selection and maintenance of any OSILS such as a) to install and test more than one OSILS to find

the suitability against the library requirements b) to view freely available technical documentation, bugs information, user's queries in discussion forums and release notes of latest version to get valuable information c) to purchase additional modules from open source service providers or making use of the in-house expertise to build the required features. d) to ensure the availability of standards for data exchange and e) to understand existing and expected features of the software etc. The study came to the conclusion that it is necessary to make library professionals aware about the advantages of OSS.

Sheeja in her web based study on *Adoption of Koha open source software in libraries: A web based study* discusses the origin of OSS and identifies the extent of adoption of Koha in libraries across the world by analyzing its region wise distribution and category wise installations (Sheeja, 2009). She found that even though Koha is OSILS with number of facilities and features and a lot of web resources and community support offered over net for installation and implementation, very few libraries adopt the software for their libraries and concludes that adoption of Koha in libraries is still at infancy.

Chauhan in his study on *Library automation step-by-step* gives an overview of the need for library automation, standards to be adopted, general features and selection and acquisition of ILS (Chauhan, 2006). Also explains the need for evaluation of ILS, steps and criteria to be followed in the selection, activities involved in its implementation and concludes that the ILS improves the efficiency of libraries and enables sharing the resources of other libraries, provides flexibility and convenience for users and staff. The study hints that for the successful implementation of an OSILS or proprietary ILS all key factors must be in place- support from administration, staff competence, consideration of user requirements, presence of infrastructure (hardware, software, network), available data, excellent managerial skill from the coordinator of the project, end user interfaces.

Duraisekar and et al in their study on *Implementation of automated library management system in the School of Chemistry Bharathidasan University using Koha open source software* share their experiences and the issues encountered while implementing the OSILS package Koha and its advantages in enhancing the functions and services of the departmental library at the School of Chemistry, Bharathidasan University (Duraisekar and

et al, 2010). They conclude the study by stating that Koha Software is more suitable for automation of any kind of library.

Giri's paper on *Implementing and exploring open source library management software: Evergreen* explains the importance of library automation in general and the need, major features and the process of evaluation of OSILS in particular in libraries (Giri, 2011). The study gives an overview of OSILS, Evergreen, its hardware and software requirements, compatibility with the operating systems, installation process and the features of each module based on the task to be performed by the library staff. The paper suggests the library professionals to be aware of the advantages of OSS and stresses that they should get involved in OSILS development to have greater control over the working environment in libraries.

Kumar's book chapter on *Best practices for open source technology management in library and information centres* gives an overview of open source technologies, adoption planning, selection criteria and procurement, data migration, implementation, training and maintenance (Kumar, 2015). The study ascertained that the lack of awareness and opportunities for training are the main barriers for wide adoption of OSILS in libraries and concludes that the success rate of open source technology implementation depends on attitude to build skill set and dedication of library staff.

Singh and Sanaman in their paper on *Open source integrated library management systems: Comparative analysis of Koha and NewGenLib* evaluates and compares two OSILS packages, Koha and NewGenLib qualitatively and quantitatively and points out that Koha had more specific characteristics of OSILS whereas NewGenLib has better functionalities of modules (Singh and Sanaman, 2012).

Dhamdhare's paper on *ABCD, an open source software for modern libraries* provides an overview of the recently added menu-driven OSS based on UNESCO's CDS/ISIS, ABCD (Automatisación de Bibliotecas y Centros de Documentación), which offers a complete solution to library automation with ISBD as well as local formats along with flexibility and versatility in use (Dhamdhare, 2011). Each module of this OSILS is systematically explained along with the special features of the software such as radical

openness for database-structure and full-text capabilities, technical and technological features and its adeptness in indexing and retrieval, web OPAC, library portal with integrated meta-search and content management system to manage online as well as offline digital resources and physical documents and media.

Giri and Sengar's article on *Use of open source software in the Learning Resource Center of Indira Gandhi Institute of Technology: A case study* gives an overview of library automation using OSILS and its selection and practical implementation aspects for managing the activities and services (Giri and Sengar, 2011). The paper gives the installation experience and problems encountered by the authors while implementing OSILS using the software NewGenLib and conclude that the main pre-requisite of OSILS use in libraries is the librarian's potentiality to harness staff motivation in a positive way. The study found that OSILS is more future oriented, easy to customize and can be an effective low cost alternative to their proprietary counterpart.

Kumar's paper on *Community participation in library automation system development: Opportunities and challenges for libraries in India* gives an overview of OSS and proprietary software and the need for user's participation in the development of OSILS specifically Koha (Kumar, 2011). The study found that though the adoption rate of OSILS in India is comparatively slower than other developed countries due to lack of awareness among library professionals many prestigious library automation projects in India adopted Koha due to its capability in handling Indian languages and its active user community. The study concluded that growing number of community members helped Koha to become a mature ILS within a short span of time.

Rai and Kumar in their research article *Comparative features of integrated library management software systems available in Delhi* discussed the progress of library management software and traced out the characteristics and trends of software with special reference to packages that provide either web interface for some of their modules or total web-based solutions for all management modules (Rai and Kumar, 2011). Also compared services and facilities and technologies incorporated in library automation packages and found that though there is a variety of software available in the software marketplace, only a few of them are fully web compatible and support maximum technological features.

Lihitkar and Lihitkar in their research paper on *Ranking of selected library software packages in India* evaluated and ranked the major commercial library automation software packages used in India (Lihitkar and Lihitkar, 2011). The study revealed that the superiority of the software packages depends upon their capabilities and versatility and out of ten library software products surveyed, in terms of software features LibSys, in terms of circulation and overall features SOUL, in terms of OPAC features Libman, and in terms of acquisitions features LibSys, SLIM 21 and SOUL are the most highly rated software.

Satpathy and Maharana in their paper entitled *Awareness and adoption of open source software among LIS professionals of Engineering colleges of Odisha* evaluates the awareness and adoption of OSILS by the LIS professionals working in various engineering colleges of Odisha (Satpathy and Maharana, 2012). Based on survey method authors found that although the LIS professionals of engineering colleges of Odisha have knowledge on OSILS, their uses in libraries are in budding stage. The paper suggests that for the widespread use of OSILS in engineering college libraries of Odisha, a cooperative and participatory organizational system, positive attitude of authorities and LIS professionals and proper training provision for LIS professionals need to be developed.

Giri in the paper on *NewGenLib 3: An integrated open source library management system that makes your library visible in web* gives an overview of origin and advantages of using OSILS in libraries especially NewGenLib, which is used by many libraries in India, South East Asia, Africa and the middle east based on remote desktop applications and also its availability on cell phones and tablets running Android (Giri, 2012). The study also lists out the reasons and advantages of various technologies used in the presentation, web server and the database layers and the five tier modular architecture of NewGenLib along with its functional features especially cataloguing, circulation and OPAC interfaces. Giri explains the characteristics of the software from a practitioner's view with reference to the experience in Indira Gandhi Institute of Technology, New Delhi where the NewGenLib is installed and maintained in the LRC. The paper suggests that the OPAC of NewGenLib needs more attention from developers keeping in mind the library's user centred philosophy. More flexibility is to be provided for library staff for customizing different



modules as per their requirements along with the configuration of associate library and provision for union catalogue.

Biju and et.al in *A study on managing Koha open source library management system using live CD* explain the benefits and ease of using Koha Live CD to learn or to implement Koha software and found that the usage of OSILS are very low in libraries due to lack of proper awareness and training among library professionals on the complex installation procedures (Biju and et.al, 2012). The paper gives an overview of major Koha Live CD projects, technical aspects and steps involved in creating Koha Live CD. Authors conclude that the availability of Koha live CD free of cost and the provision to test the software before taking decision on its implementation increased the popularity of the software among library professionals and it also saves considerable time for its installation during training programmes.

Barve and Dahibhate paper on *Open source software for library services* gives an overview of OSS available for various library services, its benefits and drawbacks (Barve and Dahibhate, 2012). The study also discusses the status of OSILS in libraries with an emphasis on Koha and suggests that Koha software can be used in all types of libraries such as from School to National library. The study found that the library professionals can effectively use OSS to provide innovative services to their users and without involvement of any large budgets.

Kamble and et al in their paper on *Open source library management and digital library software* discusses the definition, features, selection criteria, advantages and limitations of OSILS in general. Also describes in brief about the feature of OSILS packages such as Koha, NewGenLib, PhpMyLibrary, OpenBiblio, and Avanti (Kamble and et al, 2012). The paper concludes that LIS professionals should be able to choose appropriate technology depending upon their needs and acquire new skills for developing and managing the libraries using OSILS.

Kumar and Jasimudeen in their paper on *Adoption and user perceptions of Koha library management system in India* discusses the history of Koha software, lists libraries in India using the software, and the perceptions of users on Koha in Indian context (Kumar

and Jasimudeen, 2012). Authors evaluate the satisfaction level of users and the implementation difficulties Indian library professional face with Koha. The study found that the software is popular among the southern states of India and the number of Koha users in India is growing because of availability of Koha live CD, implementation of the software in reputed libraries, news appearing in popular discussion forums and the inclusion of the software package for study in library science course.

Dhanavandan and Tamizhchelvan in their study on *An evaluative study of automation software applications and database management systems in academic libraries* demonstrated and elaborated the library automation software and its types used in self financing engineering college (SFEC) libraries in Tamil Nadu (Dhanavandan and Tamizhchelvan, 2012). The study found that ninety five percent of the colleges use some library automation software and the software Autolib stood first among the most used automation software followed by Libasoft.

Randhawa's research paper on *Open source library management softwares* discusses the features of OSILS in general and the steps to be followed when selecting the software depending on the specific needs of the library (Randhawa, 2013). The study examines the advantages and limitations of OSILS with a brief description about the features of major OSILS such as Koha, NewGenLib, Evergreen, SENAYAN, ABCD and BiblioteQ. The study suggests that OSILS can be appropriate alternative for proprietary packages to automate library systems. However library professionals are required to acquire new skills for developing and managing the library using OSILS.

Babu and Krishnamurthy in their research paper on *Library automation to resource discovery: A review of emerging challenges* examines the present situation of library automation and resource discovery scenario in India (Babu and Krishnamurthy, 2013). They found that though the growth of the Indian library automation industry is booming, library software adaptation, next-generation catalogue enhancements and community development avenues are seemingly remote and far from satisfactory. The study found that although Koha has become a popular OSILS in India, proprietary software is also gaining considerable prominence. Both OSILS and the proprietary ILS markets are thriving, and carving a niche in the expanding higher education sector. The study opines that generation

gaps, perception of library staff towards computing technologies, lack of government and organizational support, lack of initiatives by federal and state governments etc. are the major hindrances for library automation in India. The study concludes that although the technological adaptation and diffusion vary from country to country, in India the library automation industry's growth has been rather slack and sluggish.

Archana and et al in their study on *Catalogue interfaces of integrated library management systems (ILMS):Experiences in a proprietary and open source software* have analysed the features of the cataloguing modules of Adlib Library (proprietary software) and Koha (Open source software) and found that the cataloguing module of Koha is almost at par with that of proven proprietary software that has been in market for the past 25 years and by incorporating some of the suggestions recommended by the authors, Koha can be made the best ever OSILS that can cater to the needs of any type of library (Archana and et al, 2014).

Hanumappa and et al in their research study on *Open source software solutions in Indian libraries* indicate that there is considerable interest among Indian libraries to adopt or migrate to OSS and majority of libraries that use OSILS solutions (Hanumappa and et al, 2014). The result of the study also revealed that there is ample scope for improving satisfaction levels of existing ILS offered in India and this may be one of the reasons for the overwhelming interest from Indian libraries to migrate to new ILS. In their conclusion, the authors hoped that the future of OSILS for libraries in India may exist in a variety of areas other than just the ILS and digital library.

Reddy and Ragavan *Usage and adoption of free/open source software (FOSS) in Government degree college libraries of Karnataka* found that e-Granthalaya was one of the prominent software for automating the small and medium sized libraries with major features (Reddy and Ragavan, 2015). Authors observed that though the software supports the digital library functionality and exporting of data other formats, e-Granthalaya has less features when compared with other prominent OSILS like Koha, NewGenLib etc. especially in interoperability issues. The software is not compliant with interoperability and lack many features.

Mishra in his article on *Systematic approach of data migration, customization and implementation of Koha: a case study of Saharanpur Campus Library, IIT Roorkee* (Mishra, 2015) discusses the step by step data migration process, configuration, conversion of data from existing legacy system to standard MARC format and customization of Koha based on their experience at IIT Roorkee, Saharanpur Campus Library which used Troodon3 commercial software. Author concludes that library automation with Koha and data migration and designing of websites can be done step by step and successfully by library professionals with the help of solutions available on web.

Londhe and Patil surveyed the development of release activity and community activity of OSILS developed during 1999 to 2014 in their paper on *Open source library management systems: A survey and present developmental status* and found that there are thirty-one open source integrated library management systems and among them only fifteen LMS projects show recent activity in community and their releases (Londhe and Patil, 2015). This study also revealed that maximum number of active projects were having institutional support and also that there are considerable number of weekly downloads for old releases of some inactive state projects.

Naveen and Nagesh in their research article on *Status and problems of library automation in Government first grade colleges of Hassan district, Karnataka: A study* revealed that only 23% of libraries are automated in the said area and indicated that inadequate staff, lack of infrastructure, insufficient funds and lack of training to library staff are the major problems for automating their libraries (Naveen and Nagesh, 2016). The study suggested that the parent body of government first grade colleges need to be provided basic ICT infrastructure like desktops with good configuration, power backup, bar code printer, bar code reader, scanner and internet connection for enabling library automation and also pointed out the importance of staff training.

Madhusudhan and Singh in their research article in *Integrated library management systems Comparative analysis of Koha, Libsys, NewGenLib, and Virtua* qualitatively and quantitatively analyzed and ranked two open source ILS namely Koha and NewGenLib and two commercial ILS namely LibSys and Virtua based on their features and functions using a structured evaluation checklist (Madhusudhan and Singh, 2016). The study found that

Virtua software ranked higher than other software, however none of the analyzed software received the rank of 'very high' hence assumed that these software are lagging behind in exploiting the full potential of web 2.0 features and needs to further improve web OPAC, cloud computing features etc. apart from modules like serial control, circulation, web OPAC and web 3.0 features.

#### **2.4. Problems of Specific to the Region: A Virgin Area for Study**

In summary, literature review reveals that studies on OSILS in Indian scenario addressing problems specific to India are only very. Available studies have not approached the topic from an integrated view or comparatively assessed all the solutions available. There was also limited research study on the perceptions of library professionals towards the OSILS. It has been established from review of literature that OSILS is a preferred choice for use worldwide because these packages meet the expectations of professionals to provide services for free or low cost from the library. Review also revealed that there are numerous software packages developed under open source for libraries and many of them are unmaintained and are without any updates. However the earlier studies clearly indicate that selection of suitable software is very important in library automation process. For any library automation package, it is necessary to improve their quality and features according to the current technology and also customize the packages according to local requirements if they are to be made capable to provide effective services. These packages need to be compatible with national and international standards and have to support maximum technological features.

The literature available on earlier studies reveals that Koha, NewGenLib, e-Granthalaya and Evergreen are the commonly used OSS packages in the academic, public, special and research libraries in all over the world. They have been used in many Indian libraries also. Available few comparative studies in the topic opine that Koha stands first among the OSILS and it appears to be a better choice for the libraries in India also as libraries are trying to get more control over the features of the software to effectively meets their needs. Koha is undoubtedly one of the full-featured OSILS, which has been widely adopted and supported by various organizations worldwide. The modules and features have proved to be more efficient among packages of its kind. However selection of a suitable

OSILS depends on other factors such as sustainability, availability of functionalities to meet specific requirements, consortia supports, quality documentations, community participation etc. In Indian context as we have documents in more than 20 languages and scripts any OSILS to be used in the region has to address problems that are special to the region. The survey revealed that no in-depth study on OSILS in comparison; with stress to the problems specific to India has already been undertaken.

## Chapter 3

# DATA, SAMPLE AND METHODOLOGY

### 3.1. Introduction

This chapter focuses on the structure and methodology used to ascertain the perceptions of Library and Information Science (LIS) community towards Open Source Integrated Library System (OSILS). Two different methods were chosen for the study to collect data on perception of individual LIS professionals on OSILS: - a survey method using structured questionnaire and interview schedule to collect experts view on OSILS through personal interview and are formulated as data collection tools. The questions were designed in such a way as to collect the maximum inputs in accordance with the objectives of the study. The questionnaire had three compartments and contains precise, pre-determined, and concrete questions. Many of the questions were made mandatory and framed as closed questions and few were given flexibility so that the respondents can express their view in detail in their own words. Utmost care was taken to frame the questionnaire in simple words, apprehensible and sequential according to the relevancy. A covering letter explaining the objectives and structure of the research study was included in the questionnaire. The respondents of the questionnaire were given ample time to respond even after sending frequent reminders. Moreover the research assured the respondents that the information provided in the questionnaire will be kept confidential and identity of respondents will not be revealed to any one and the data provided will not be used for any purpose other than this specific research work.

### 3.2. Sample Population

The area of coverage is limited to India. Sample libraries are those using commercial or proprietary software for library automation. The sample is limited to the responses of only those who have responded to the questionnaire from India, i.e. 601

libraries including university, college, school, special and research libraries using any one of the ILSs which have responded. As the research study focused more on open source ILS the importance was given to collect maximum details on the software. However, intention was also to have a comparative analysis study and general overview of the commercial ILS. Even the selected ILS being used worldwide may have different versions prepared by users and may be working better than in Indian situations; but they are not under the scope of this study. Hence the present study is limited to the versions of the packages used in India and to the systems in which they are used in India forms the limitations of this study.

### **3.3. Method of Sample Selection**

As the methodology applied for sampling was online questionnaire, many numbers of responses were received. However to make the analysis error free, questionnaires that were answered honestly in all respects were only considered for final analysis. The research study used mixed methodologies including web based and hard copy questionnaire and personal interview, to analyze the situations of adopting OSILS in Indian libraries. Different types of questionnaires for online survey through Google which used a structured questionnaire to collect data from the Indian libraries which have installed any one of the automation packages. The sample used were 601 libraries including university, college, school, special and research libraries using any one of the ILSs.

The research report is divided in to seven chapters. Chapter 1: Introduction gives a perspective of library automation, with stress to Indian context. Also describes, proprietary and non-proprietary packages for ILS and the processes involved in adopting Open Source packages. Chapter 2: is Review of Literature and it surveys the work already done in related areas. Chapter 3 explains the Data, Sample and Methodology. Chapter 4 discusses the Commercial ILS used in Indian Libraries with a brief description on their characteristics, functionalities etc. Chapter 5 discusses the Use of Open Source ILS in Indian Libraries with stress on commonly used packages and their brief description, including year of first release, license category, modules available, latest version, and the details of the responded libraries in India using the software. Chapter 6: Presents the analysis, findings and recommendations based on the responses received through online questionnaire and



personal interviews done over a period of eight months. Chapter 7 presents the Conclusion and Recommendations

### **3.4. Sampling Procedure**

The research study applied a mixed methodology to collect the data. Questionnaires and Interview Schedules were used to extract data. An online questionnaire was designed in order to get the response swiftly and to cover maximum areas of the study. The Questionnaire consisted of three parts, a) PART -I: Common Questions for Libraries using any Integrated Library System (ILS) b) PART -II had questions only for those libraries who use OSILS and c) PART -III contained the questions for those who use an Integrated Library System (ILS) package other than 'Open Source' that is Commercial or Proprietary or In-house or Software developed by others. Interview schedules were also used to extract information from the three categories of users. The above instruments were used to examine the functional characteristics and performance of OSS meant for ILS.

### **3.5. Data Collection**

The research study, as an initial step evaluated all the available ILSs both in open source and proprietary streams used in Indian libraries to identify the performance and efficiency. Many of the ILS packages becomes inactive after a few years due to many reasons such as poor community participation in its use and developments, lack of updates, merger of service providers etc. The community involved in each software used in Indian libraries were also measured in terms of its number of users, to determine the possibility of sustainability of the software. The research study opted mixed methodology to obtain the complete picture of ILS usage in Indian libraries and their perception towards OSILS. The online survey questionnaire method was adopted as the primary means in pilot study to collect data from various libraries across the country automated with any of the ILS package. Experiences of expertise in the ILS domain were taken as the second method to collect data in the later stage of the survey. Different free online questionnaire platforms were considered in the earlier stage and tested with sample feedback. Considering the volume of the questionnaire and the capacity of the online tool to categorize and retrieve the responses in an organised and comfortable way, the final questionnaire was hosted in

the questionnaire tool of Google. 'Google docs' survey tool provided by Google was chosen for deploying the questions of various kinds and the URL link of the same was randomly sent to diversified libraries across the nation with a covering letter via email requesting them to participate in the online survey. The survey targeted the institution wise responses from universities, colleges, schools, corporate, non-profit, public and special or research libraries. The URL link of the questionnaire with a request letter for the participation with frequent reminders were sent over a period of eight months, starting from March to October 2014 to more than 5000 email IDs to have a wider participation. From respondents those who found difficulty in filling up the online questionnaire were provided the softcopy in .doc file which was sent via email and the response of the same was updated at the same time. After the initial email with a request to fill the questionnaire, frequent reminders at regular intervals were also sent till they completed the survey.

Results from Google docs were downloaded in Microsoft Excel format for analysis and generating graphical representations like bar diagrams, pie diagrams and tables and figures. Qualitative comments from the questions under each Part were exported and analysed in a separate work sheet in Microsoft Excel. Special care in consultation with professionals and colleagues were taken to include all the relevant questions which supports the objectives of the study. Also effort was taken to send the questionnaire to maximum number of libraries with frequent requests and reminders.

### **3.6. Organization of the Questionnaire**

The main objective of the questionnaire was to collect a wide range of data from library professionals working in different types and size of libraries across India. In this research study, responses and views of library professionals who were working with commercial ILS or open source ILS on different aspects were collected and analysed. As the study focuses more on Open source ILS, a comprehensive questionnaire was prepared for them to respond on different aspects and open ended questions were included to explain their experiences and lessons learned in detail. The survey questionnaire was organized in three sets namely Part-I, Part-II and Part-III to get the responses of each category of users.

**PART-I:**        *Common Questions for Libraries using any Integrated Library System (ILS)*

**PART-II:**        *Questions for Libraries using any Open Source Integrated Library System (OSILS)*

**PART -III:** *Questions for Libraries using any Integrated Library System other than Open Source*

The survey questionnaire consisted of total 47 individual questions containing intermixture of open ended, closed ended, mandatory, optional and rating type questions distributed within three sections. Definitions and explanations have been given under some of the questions where clarification is required. Likert scale was also used in several questions to understand the level of attitude of the respondents. Balanced, seven point scale and five point scale were used to analyse the results in an unbiased way. Options for both negative and positive statements were given in each part of the questionnaire to prevent respondents from presenting a biased result when selecting the same answer for each.

### **3.6.1. PART -I: Common Questions for Libraries Using any Integrated Library System (ILS)**

The first section of the questionnaire consisted of common questions for all respondents who were using any of the ILS. First part of the questionnaire was meant for all the respondents irrespective of the nature of ILS they were using. This first section of the questionnaire consisted of twenty-one questions, and among them, eleven were closed ended questions and ten were open-ended questions. Out of 21 questions, 17 were mandatory and 4 were optional questions. Respondent's name, URL address of the library where the respondent is working, version of the software being used currently by the library and the name of the ILS / Library automation system being used previously were made optional. The 11 closed ended questionnaire in the first part consisted of questions regarding age group, library type, collection size, staffing pattern, final authority in deciding the software, type of the software being currently used, awareness and support for adoption of OSILS, best suitable software for Indian libraries, opinion on the ideal person to write the documentation and opinion on some of the selected issues associated with the

wider adoption of OSILS in Indian libraries. The open-ended questions consisted of the profile of the respondents such as name, designation, educational qualifications and email addresses and the profile of the representing library such as name of the library, URL address, name and version of the ILS being used, year of adoption of the software and previously used software.

The questionnaire consisted of 21 questions in total focusing on demographic details and general questions on both proprietary and OSS for ILS. They are name of the respondent, designation, educational qualification, age, email ID, name of the library they belong and the URL of the Library. Drop down boxes with predefined answers to indicate the type of library and collection size were given. Attempt has also been made to collect the number of staff working with the library in terms of professionals, semi-professionals and supporting staff category and the final authority in deciding the selection of ILS. To identify the nature of the software being used classification was made on four categories such as commercial / proprietary, open source, in-house and developed by others to choose one and followed by questions on its version and year of adoption. To identify whether the library has migrated from some other system or choosing the existing software first time optional question on the name of previously used system also was provided. To understand the awareness on OSILS and their support on its adoption separate questions were asked. Names of the popular OSILS were listed to choose the suggestion on best suitable software for Indian libraries and their views on who should write the documentation for software also has been given. As a last common question in the first part of the questionnaire to identify the major issues associated with the wider adoption of OSILS in Indian libraries multiple choice question were given with options such as lack of promotional activities, issues of data security, issues of software security, organizational policies, lack of technical knowledge required to install and maintain, lack of vendor support, shortage of skilled staff to install and maintain, lack of major functional features and modules, issues of reliability/longevity, lack of community support, lack of technical support, lack of high quality documentation, availability of commercial software and others. The questions included in Part –I of the questionnaire is listed in Appendix-I.

### **3.6.2. PART –II: Questions for Libraries Using any Open Source Integrated Library System (OSILS)**

The second section of the questionnaire was designed only for respondents who use OSILS only and consisted of 16 questions in total in which 11 were closed ended and 05 were open ended. Questions included in the second part of the questionnaire focuses only on the perceptions of libraries using OSILS. Reasons for migration, customizations required etc were also checked. The questions included in the Part –II of questionnaire are listed in Appendix-II.

As an attempt to find out why libraries are considering OSILS to perform their functional activities, the first question in the second part of the questionnaire was designed with multiple choices. The probable reasons can include: to cut short the costs, to become part of the consortium, its ability to customize to fit the library's needs, its wider adoption/support/online community, availability of source code, easy to install, maintain and modify, freedom from maintenance and licensing fee, freedom from vendor lock-in, uncertainty due to merger and outside ownership of proprietary software, concerns about the suppliers of proprietary ILS, availability of quality documentations and column for any other reason not included in the listed options were provided. All the major functional modules commonly available in an OSILS such as acquisition cataloguing, circulation, serials management, Statistical reports, patrons details, OPAC, system administration, stock verification were listed in seven point scale (1-Excellent, 2-Very Good, 3-Good, 4-Fair, 5-Poor, 6-Very Poor, 7-Never Experienced) to mark according to their level of experience. Same list of modules were also used to compare its idealistic approach with commercial software and the need for customization. In order to have a clear picture of the efficiency of the software being used in comparison with a paid software major activities of the software such as installation, database maintenance and backups, features and functionalities of modules, customizations and integrations, house-keeping and report generation, technical/community support, documentation, user's response, upgrades and enhancements, design and coordination of statistical reports, managing print resources and managing electronic resources were listed to choose in the same seven point scaled mentioned. Question was asked on whether they arranged any conference/seminar, training programs,

workshop, added as part curriculum/syllabus, created user groups/forums, lectures or any other promotional activities as a measure to promote the use of OSILS. To find out the mode of operation to perform activities such as installation, migration of data, configuration, training of staff, hosting, maintenance, upgrading / adding more features, customization, bug fixing possible options were listed to mark as self, outsourced to ILS vendor, through another library, through professional friends/community, through library consortium, through online tutorials, through live CD/DVD course materials and Nil questions were set.

The statements listed to find out the opinion of the respondents in Yes or No or Can't say level on OSILS are: i) supports all library services, ii) supports customization display format depending on the requirement, iii) supports storing and retrieval of records in local /other Indian scripts, iv) supports indexing and searching of records in local /other Indian scripts, v) allows the end user to build queries in more than one script, vi) allows creating multilingual interface and vii) able to display text in more than one script. The intention of the respondents in changing their OSILS also became part of the questionnaire and the possible options such as found software more suitable to the needs, no current development activities, lack of technical support, difficulty in maintenance and up-gradation, concerns about the existence of the software and other were given if their answer is positive. Supporting this answer, name of the software they intend to adopt or migrate also has been asked. As an optional and advanced question to check the experiences of the respondents on fixing any significant bugs or limitations of the software participants were asked to comment.

Considering the Indian context, questions were formulated to test the level of agreement in five point scale (1-Strongly Agree, 2-Agree, 3-Neither agree or disagree, 4-Disagree, 5-Strongly disagree) to cover all the issues associated with the adoption of OSILS. The statements were as follows: a) more libraries in India are switching to OSILS, b) application of OSILS should be part of the academic curriculum, c) support on OSILS has increased from both Library professional organizations and Government, d) library fraternity should involve in conducting training programs and workshop, e) library professionals should have more opportunity to attend free awareness and training programs

on OSILS, f) high quality documentation on OSILS should be available on the public domain, g) OSILS provide significant economical and technological benefits, h) application of OSILS in libraries leads to greater innovations and collaboration among the communities, i) application of OSILS in libraries increases competition among service offerings, j) application of OSILS in libraries facilitate efficient use of resources across the country, k) OSILS are better choice for libraries to adopt, l) OSILS enhances the technical and technological expertise of library professionals and develop new skills, m) adoption of OSILS helps sharing of knowledge and skills, n) OSILS are flexible and adaptable for all types of libraries, o) OSILS gives more control over the data and software, p) OSILS are more suitable for long term services compared to proprietary systems, q) Indian libraries should consider consortia model for wider adoption of OSILS, r) Indian libraries should have customized versions of single OSILS for any type of Library, s) Indian libraries should have an OSILS to support various Indian scripts.

Three mandatory questions were prepared in the last section of the second part of the questionnaire in descriptive type to know the best and worst things in adopting OSILS and their suggestions to improve the quality of the OSILS they were using.

### **3.6.3. PART –III: Questions for Libraries Using any Integrated Library System Other than Open Source**

Part-III of the questionnaire was designed to collect feedback from the library/IT/computer professionals who use any ILS package other than 'Open Source' i.e. commercial/proprietary/in-house/software developed by others.

Respondents were asked to indicate their level of satisfaction with the features of the ILS being used listed as: a) features and functionalities, b) maintenance and backups, c) customization and integrations, d) documentation, e) vendor support, f) house-keeping and report generation, g) managing print resources, and h) managing electronic resources using a predefined scale of point such as Extremely Satisfied, Very Satisfied, Moderately Satisfied, Slightly Satisfied, Not at all Satisfied and Never Used in their decreasing order of satisfaction. The second question of the third part of the questionnaire was designed to test the quality of experience with the functional modules of the ILS being used by the

respondents with choice of excellent, very good, good, fair, poor and never experienced and it covered all the major functional modules in an automation software such as acquisition, cataloguing, circulation, serials management, statistical reports, patrons details, OPAC, system administration and stock verification.

To understand the opinion of commercial ILS users to adopt OSILS questions were included on whether they plan to adopt OSILS and if so, asked to indicate reasons mentioned such as cost effectiveness, shrinking budget or pressure from the management, demand from users, easy to use and customization for local needs, technical or community support, vendor support, flexibility, full control over the data and software, full control on the direction of development and 'other' as a multiple choice question to consider the migration. Though commercial software attract major portion of the library budget, some libraries still stick with their commercial software. With the motive to understand this, questions were asked with a list of multiple choice answers such as i) satisfied with the existing proprietary software, ii) lack of major functionalities, features or modules, iii) lack of support from vendors and community, iv) lack of commercial support, v) lack of in-house technical expertise, vi) complex installation procedures, vii) lack of adequate library collection, viii) difficulties in maintenance, ix) lack of knowledge in open source technology, x) lack of experience and training, xi) lack of proper documentation, xii) lack of exploring options for migration, xiii) lack of IT infrastructure, xiv) lack of reliability, xv) lack of motivation from the management or organizational policies, xvi) lack of sufficient manpower and xvii) other aspects to check why they have not adopted OSILS though they are available free of cost with all the functional characteristics matching with commercial software. There was a mandatory question, without considering whether the respondent is using commercial or OSS, whether they had anytime experimented with or trained in OSILS. In order to get clarity on the views of commercial users on choosing best suitable software from OSILS category the list of software were given to choose along with open ended option to indicate their own choice.

Questions were also included to get the views of commercial ILS users on OSILS in five point scale (1- Strongly Agree, 2- Agree, 3- Neither agree or disagree, 4- Disagree, 5-Strongly Disagree) on the following statement on OSILS: a) OSILS requires more



technical expertise than proprietary software, b) OSILS are more expensive than anticipated, c) Exhaustive training is required for implementing OSILS, d) OSILS lacks scalability, e) OSILS lack ability to meet current and future demands of the library, f) OSILS has only fewer advanced features, g) Entry of OSILS had a major effect on the proprietary ILS market?, h) OSILS increases the efficiency of the library services, i) OSILS gives financial advantages as compared to commercial ILS?, j) OSILS provides lower functionality than commercial software, k) OSILS are less user-friendly than commercial ILS, l) OSILS lack high quality documentations, m) OSILS create more work for library staff in-terms of customization and maintenance. Finally two descriptive mandatory questions were asked to explain the best and worst things in adopting OSILS for libraries. The questions included in the Part –III of the questionnaire is listed in Appendix-III.

### **3.7. Opinions from Professional Experts**

Apart from the survey questionnaire the study also sought the views and experiences of senior library professionals from various libraries on OSILS adoption and its advantages from both personal and organizational perspectives.

### **3.8. Decision Support on OSILS**

The questions in each part of the questionnaire set have been formulated using Google docs and the URL linking the questionnaire were distributed to the library community with-in the country through personal and institutional emails, online discussion groups such as lisforum, listservs and printed copy of the questionnaire was circulated among the LIS professionals by post. Population of the study consisted of different types of libraries in India such as University libraries, College libraries, School libraries, Non-profit organizations libraries, Public libraries, Special and Research libraries using any of the ILS. The questions were designed and developed to collect primary data relating to the objectives of the research study. The comprehensive online survey with a structured questionnaire was carried during February 2014 to July 2014 followed by subsequent reminders. There were 601 responses received in total from different types of libraries during the survey period. The total responses were checked one by one to avoid multiple

entries from the same organisation and ensuring the quality of the feedback. This left a total of 520 responses of the survey for final analysis, keeping the correctness and accuracy of the data after exhaustive checking and scrutiny to avoid duplicate entry from the same institute with different professionals and also to eliminate the wrongly entered responses. In case of multiple responses received from the same institute, the respondent with higher qualification was selected for the analysis. Investigation on various perspectives on both open and commercial software has been carried out based on the collective responses from the individual institutes. This study has encountered many difficulties with-in the survey and data collection. Many of the libraries were not familiar with any of the ILSs. The majority of the participants reported that they support the adoption of OSILS.

So this research study can enrich knowledge on OSILS in the context of Indian library environment and the results of survey and the experiences of professional expertise obtained can provide a novel contribution to the knowledge on pros and cons of OSILS literature for library administrators and decision makers.

## Chapter 4

# COMMERCIAL ILS IN INDIAN LIBRARIES

### 4.1. Earlier Library Automation Packages

The software world has changed dramatically over the past two decades. Working nature of libraries is more collaborative and service oriented. There has been unimaginable growth in knowledge and information and the documents in which it is recorded and their management is become more complex over the years. Library professionals should be moulded accordingly to tackle the new technological challenges to manage the ever growing information industry. Selection and use of suitable library automation tools is one of the crucial steps to be taken by the library professionals to manage information and knowledge. One of the key differences between a proprietary and an Open Source Integrated Library System (OSILS) involves the accessibility of information about the available features. With proprietary systems, a library may issue an RFP (Request for Proposal), eliciting a response where the vendor describes the functionality available (Breeding, 2008b). Unlike OSILS, commercial software extends their support to get assistance to solve problems without much effort. Commercial ILS gives the user only limited use- rights with restriction on numbers of users or systems and restrict the access of its source code to use or modify and distribute. Most of the commercial ILS will have limited user clients and limited number of OPAC clients for a single library. Also it has annual license or maintenance fees. Though most of the proprietary solutions are extensively meeting the needs of librarians as well as the patrons effectively, they fail in the economic factor. In some case the software does not comply with many important international standards to perform the library activities. Sometimes it is very difficult to revive the old installed version if we do not update it for a longer time and are forced to buy the new version of the software along with its supporting software including operating systems.

## **4.2. Commercial Library Automation Packages**

Integrated Library System (ILS) can be broadly divided into two namely Open source and Commercial/proprietary based on their development model and access to the underlying code. Commercial ILS is mostly owned by a company or individual and the underlying source code in which the programs are written as text document is not made public. Users of the software will be charged for any modification, addition or customization in addition to their original cost and user does not have licence to modify the software.

## **4.3. List of Commercial Integrated Library System used in Indian Libraries**

The pilot survey indicated as part of the present research work showed that Indian libraries were using number of proprietary ILS since 1980's. The proprietary software packages identified in the pilot survey are discussed below.

### **4.3.1 Adlib Library**

Adlib Library is an ILS developed by Adlib Information systems, Netherlands specifically for information and catalogue management in libraries. The software has modules for acquisition, circulation, cataloguing and serials management and all the modules are integrated with the catalogue and thesauri (Adlib Library, 2015). The thesaurus option of the software is actively available during data entry, editing and searching the catalogue making the process easy. Adlib Library has a web-enabled OPAC and the cataloguing module of the software provides 'Administrative data' which helps to determine the details of date of creation of a particular record and dates of all further editing. The software is scalable, multilingual and complies with UNICODE, Z39.50, ISBD, AACR2, MARCXML and OAI-PMH standards with data import and export facility. Adlib library software is suitable for large, medium and small libraries. Compared to other library software Adlib has simple data entry format with a display of catalogue card in ISBD format. Search in catalogue will display the details of a particular resource in its accession number and call number, location, type of material and its current status and it has different search options for its users such as simple, advanced, expert and themed

search. The latest version of Adlib provides facilities for users to reserve their materials online and custom made service to alert the users on their relevant area called selective dissemination of information (SDI). Adlib Library software is now available in four different versions such as Basis, Standard, Plus and XPlus which offers different combinations of functionalities. The software provides web hosting service through its Internet Server module for those libraries who do not want to host the application on their own. Central Library of Cochin University of Science and Technology was found to be the only Indian library using Adlib Library software for more than a decade before they migrated to Koha due to high purchasing cost of the latest/updated version of the Adlib software.

#### **4.3.2 Alice for Windows**

Alice for Windows (AfW) is a proprietary and windows based ILS developed by Softlink International, an Australian company. The software is commercially marketed and distributed among the Indian libraries by Softlink Asia Pvt. Ltd., New Delhi. The software was initially named differently in different countries such as Embla in Iceland, Alice in Europe, OASIS in South East Asia & Australia and Annie in America and other parts of the world, but due to the effort of the developer to make uniformity in the nomenclature the software is now commonly known as Alice for Windows. The programming language used is C++ and it uses relational database model for data storage. The software was mainly used in larger libraries like University libraries when it was released but now to support all kinds of libraries it has different versions such as academic library version, special library version, public library version and school library version. The software has modules such as acquisition, cataloguing, circulation, OPAC, serials control etc. to support the core activities of a library and it supports standard bibliographic format, data exchange format and barcode technology. However the modules in the software are grouped in to three sets namely Standard set, Advanced set and Special set. Circulation modules, OPAC, reports and utilities modules and management come under the Standard set. Acquisition modules, periodicals, multimedia, journal indexing and web inquiry modules are available with Advanced set. The Special set contains ILL, reservation of an item, patron self-checking and self circulation, union catalogue, retrospective conversion and multilingual features.

There are many pre-designed reports available with the Standard set, however the software also helps to generate reports in a customized way. Additional features of the software includes GUI based interface, rapid retro conversion facility, options for CAS and SDI services, online tutorials and help mechanisms. Biometric-Finger Print Scanners and RFID security systems can be integrated with the software. Now the software runs on Linux platform also. Apart from print materials, the software also supports other formats such as audio, video, websites, electronic documents , charts, maps etc.

**Libraries in India using Alice for Windows Software:** Dr S.K.Chatterjee Library of National Institute of Occupational Health (NIOH) (Indian Council of Medical Research), Ahmedabad, Gujarat; Library & Resource Centre of SOT, Pandit Deendayal Petroleum University (PDPU), Gandhinagar, Gujarat; Documentation Centre of DLF Ltd., Gurgaon, Haryana; Library of Institute of Pharmacy, Nirma University, Ahmedabad, Gujarat; Central Library of Ajay Kumar Garg Engineering College (AKGEC), Ghaziabad, Uttar Pradesh; Sir Jehangir Gandhi Library of XLRI Xavier School of Management, Jamshedpur, Jharkhand; Maharaja Surajmal Central Library, New Delhi; Library of Institute of Technology, Nirma University, Ahmedabad, Gujarat; Library of Haryana Institute of Engineering & Technology, Kaithal, Haryana; Mukta Library of Whistling Woods International, Mumbai, Maharashtra are the libraries using Alice for Windows.

#### **4.3.3 AutoLib**

AutoLib is an Integrated Library Management software which consists of all the basic modules such as circulation, OPAC, for the library housekeeping operations (AutoLib Software Systems, 2015). The software is designed and developed by AutoLib Software Systems, Chennai. AutoLib is a multi-user and user friendly software designed to automate various activities of Libraries in universities, colleges, schools, R&D institutions, public libraries and corporate, management and special institutions, etc. regardless of types of collection or size and also provides web based services on the campus Intranet/Internet. Apart from the basic modules, the software has additional modules like database management, administration, digital library and article indexing modules. The software can be integrated with RFID, Interactive voice response system (IVRS) and Biometrics. The software is developed based on client server architecture using Visual Basic as a front-end

tool and Microsoft Access is used as back end and therefore runs only on Windows platforms. There are other versions of the same software developed using Visual Basic as a front-end tool and MS-SQL as server. The software has flexible search modules with different formats and supports Z39.50 protocol. Software follows ISO 2709 as a migration tool to export and import data. It is installed in more than 400 reputed institutions in India and abroad and has a continuous product up-gradation and customer support.

**Libraries in India using Autolib Software:** Library of Modern College of Arts, Science and Commerce, Pune, Maharashtra; Library of Thiagarajar College Of Engineering (TCE), Madurai, Tamil Nadu; Central Library of Karunya University, Coimbatore, Tamil Nadu; Library of MS Swaminathan Research Foundation (MSSRF), Pudhucherry; Tamil Nadu; Library of Universal College of Engineering & Technology, Tirunelveli, Tamil Nadu; Library of Justice Basheer Ahmed Sayeed College for Women (JBAS), Chennai, Tamil Nadu; Library of Pondicherry Engineering College (PEC), Puducherry, Tamil Nadu; Central Library of Vidya Academy of Science & Technology, Kerala; Chettinad TEch Central Library, Karur, Tamil Nadu; Library of P.B. College of Engineering, Kanchipuram,, Tamil Nadu; Central Library of IFET College of Engineering, Villupuram, Tamil Nadu; Library of Kingston Engineering College, Vellore, Tamil Nadu; RCBS Libraries, Rajagiri Centre for Business Studies (RCBS), Kerala; Library of Alard Institute of Management Sciences (AIMS),Pune, Maharashtra; Central Library of Sri Krishna Arts and Science College, Coimbatore, Tamil Nadu; Library of R. G. Sapkal College of Pharmacy, Nashik; Central Library of Paavai College of Engineering, Namakkal, Tamil Nadu; Central Library of Genba Sopanrao Moze College of Engineering (GSMCOE), Pune, Maharashtra; Library of Singad College of Arts, Science & Commerce, (SCOASC Library), Pune, Maharashtra; D J Resource Center of D J Academy of Design, Coimbatore, Tamil Nadu; Central Library of Parvatibai Genba Moze College of Engineering (PGMCOE), Pune, Maharashtra are found to be the libraries in India using AutoLib software.

#### **4.3.4 DELMS**

Defense Library Management System (DELMS) is a library management software developed by DESIDOC as an in-house used software for the libraries under DRDO. The

software is written in COBOL programming language and has facilities for all housekeeping activities and services. The software is available for both DOS and UNIX platforms.

#### **Libraries in India using DELMS Software: NA**

##### **4.3.5 DELPLUS**

Delplus is an integrated multi user library management system developed by DELNET, New Delhi and is provided to the DELNET member libraries. The software is developed for all kinds of libraries with free up-gradations however it is more suitable for libraries having a collection of less than one lakh. So the software is useful for small and medium size libraries only. DELPLUS works on Windows, LINUX and UNIX operating systems and is developed using shelf Relational Database Management System (RDBMS). The Software is barcode enabled and supports standard formats such as MARC 21 and CCF format to import/export records. It has modules to perform basic house-keeping operations of a library such acquisition, cataloguing, circulation, OPAC, administration, report generation, article indexing and stock verification modules. The software facilitates data entry in several scripts and supports the customization display format based on individual requirements. Delplus is available in networked as well as stand- alone versions. The software checks the duplicate entry of records in acquisition as well as cataloguing, provides customizable reports on various aspects including over-due fines, reservation of documents, circulation status, loose issues of journals etc. The OPAC module facilitates search on multiple databases in a single search with Boolean operators and other logical operators and displays more than one display format. Users can reserve and recommend their resources through OPAC module.

**Libraries in India using DELPLUS Software:** Central Library of Sanjay Memorial Institute of Technology (SMIT), Odisha; Library of Vimal Jyothi Engineering College (VJEC), Kannur, Kerala and Library of Sri Sarada College for Women, Tirunelveli, Tamil Nadu are identified of users of DELPLUS software in India.



#### **4.3.6 Easylib**

Easylib (Entire Automation System for Libraries) is an Integrated Automation package. It can handle the house keeping operations of a library and supports acquisition, cataloguing, circulation, serials control; article indexing and OPAC services of the library started its services on 2001. The software supports the integration of bar coding and has reached 450+ installations. In addition, Easylib has been introduced as an Academic Practical Syllabus for MLISc Course at Gulbarga University (Easylib Library Automation Services, 2015).

**Libraries in India using Easylib Software:** Central Library of Yenepoya University, Karnataka; Library of Community Institute of Management Studies, Bengaluru; Library of Archaeological Survey of India (ASI), Bengaluru; Library of Dr.Ambedkar College of Education, Bengaluru; Information Centre of the Printers(Mysore)Private Ltd., Karnataka; Learning Resource Centre of Institute of Management Studies, Ahmednagar, Maharashtra; Library of A.J. Institute of Medical Sciences & Research Centre, Karnataka; Library of Justice K S Hegde Institute of Management, Nitte, Karnataka; KLE University's Dr.S.G.Desai Library of Jawaharlal Nehru Medical College Campus, Karnataka; Library of Amruta Institute of Engineering & Management Sciences (AieMS), Bengaluru; Central Library of Sinhgad College of Engineering, Pune, Maharashtra; Library and Information Center of PES Science College, Karnataka; Library & Information Centre of JSS College of Pharmacy, Ooty, Tamil Nadu are identified libraries using EasyLib software.

#### **4.3.7 Granthalaya**

Granthalaya is an integrated library software which is designed and developed in FoxPro by Indian National Scientific Documentation Centre (INSDOC), New Delhi. The software runs on both MS-DOS and UNIX platform and it consists of functional modules such as acquisition, query circulation, serials control, technical processing and administration. As the software does not support other commonly used operating system, not much libraries in India is using this software. However, some of the major libraries that use Granthalaya software are National Science Library, INSDOC, New Delhi and Nuclear Science Center Library, New Delhi (Saxena & Srivastava, 1998). The importing and

exporting of data is facilitated by the software as it is compatible with CCF and ASCII formats.

#### **Libraries in India using Granthalaya Software: NA**

##### **4.3.8 Liberty**

Liberty is also a library management system from commercial packages available in India with frequent updates provided by Softlink.

**Libraries in India using Liberty Software:** Learning Resource Center (LRC) of Jaypee University of Information Technology, Himachal Pradesh; Library of State Council of Educational Research & Training (SCERT), Thiruvananthapuram, Kerala; Division of Library & Information Services of Regional Cancer Centre (RCC), Thiruvananthapuram, Kerala; Kilachand Library of the Doon School, Dehradun; Library of the Institute of Chartered Accountants of India (ICAI), Chennai and Anna Centenary Library, Chennai are identified libraries in India using Liberty software.

##### **4.3.9 LibMan**

LIBMAN is commercial library management software of Indian origin developed by Datapro Consultancy Service, Pune. The software is suitable for small libraries.

**Libraries in India using LibMan Software:** Library of National Institute of Technology, Goa (NIT, Goa); Library of Dhanwate National College, Nagpur; Ajit Gulabchand Central Library of Walchand College of Engineering, Maharashtra; Library of Government Post Graduate College, Noida; Library of Kamla Nehru Mahavidyalaya, Bhopal.

##### **4.3.10 LIBRIS**

LIBRIS is a commercial integrated library management system. The software consists of major functional modules like acquisition, cataloguing, circulation and periodicals. The software is developed using the programming language C and runs on MS-

DOS platform for single user and UNIX platform facilitates to run the software as multi user version.

**Libraries in India using LIBRIS Software:** LIBRIS software package is used by many Indian libraries; however, State Bank College, Jawaharlal Nehru Technological University, India International Center, Physical Research Laboratory, Sri Venkiteswara Central library and Electronics Corporation of India Limited are some of the major institutions that have used LIBRIS package for their library automation (Ravikumar, 1995).

#### **4.3.11 Libsoft**

The software is suitable for small libraries. The software is commercially available with its marketing and distribution agent ET & T Corp., New Delhi. The software is developed in India.

**Libraries in India using Libsoft Software:** Library of PES University (formerly PES Institute of Technology), Bengaluru; Library of Reva Institute of Technology & Management (REVA ITM), Bengaluru; Library of Sri Krishna Institute of Technology (SKIT), Bengaluru; Central Library of P.E.S.College Of Engineering, Karnataka; Central Library of PBR Visvodaya Institute of Technology and Science (PBRVITS), Andhra Pradesh; Library of Muthoot Institute of Technology and Science (MITS), Kerala; Library of the National Institute Of Engineering (NIE), Mysuru; Dr.Raja Ramanna Centre for Knowledge Resources of Don Bosco Institute of Technology, Bengaluru; Library and Information Centre of Amrita Vishwa Vidyapeetham-University, Bengaluru; Fatima Matha National College Library (FMNC Library) of Fatima Matha National College, Kerala; Central Library of Pushpagiri Institute of Medical Sciences & Research Centre (PIMSRC), Kerala; Library and Information Centre of D.S.B.G.Government First Grade College, Karnataka; College Library of PES Institute of Technology and Management, Karnataka are identified as libraries using Libsoft software.

#### **4.3.12 Libsuite**

Libsuite is a commercial web enabled ILS developed by Soft-Aid Computer Ltd., Pune, Maharashtra based company. The software is designed based on three-tire web-centric architecture which ensures that any machine with a web browser can be a client.

Hence it does not require the client side software. The software runs on Windows platform and supports various housekeeping operations of the library such as acquisition, cataloguing, circulation, serial control and budget controls. Apart from these main modules software also has modules such as stock taking, bindery control, software product, cataloguing modules etc. The user interface of the software is easy to browse and ensures navigation through Intranet and as a security measure, provides login and password based access. The software is compatible to multilingual fonts and uses latest technologies like Component Object Modeling (COM) and Active Server Pages (ASP). The software has a personalized OPAC system with powerful search facilities. Libsuite follows Z39.50 standard communications protocol and supports all the standard modules. This software works on client server architecture and supports barcode and smart card integration, article indexing, CAS, SDI and has the provision to attach digital documents and images, audio, video etc. Libsuite software has options to generate customized reports and supports stock verification.

**Libraries in India using Libsuite Software:** Technical Information Centre of Research and Development Establishment (Engrs.) Dighi, Pune; Library of Central Manufacturing Technology Institute (CMIT), Bengaluru; Learning Resource Center (LRC) of Prin.L.N. Welingkar Institute of Management Development & Research, Mumbai and Library of Bombay Natural History Society, Mumbai are its users.

#### **4.3.13 LibSys**

LibSys is a fully integrated multi-user and multi-lingual library system and one of the popular and widely used commercial software in Indian libraries. The software is of Indian origin and is developed by LibSys Corporation, New Delhi. The software is designed based on client server architecture and uses TCP/IP for communication and networking. The programming language used for developing the software is C and Java with B-Tree and its uses Inverted file technique for data storage. The software is platform independent and works under Windows, LINUX and UNIX and as client-server model. The software has all the basic modules to keep all the housekeeping operations such as acquisition, cataloguing, circulation, OPAC, web-OPAC, serials control and article indexing. LibSys provides ANSI Z39.50 compliant web access and supports bibliographic

standard formats like USMARC, UKMARC, CCF, UNIMARC etc. The LSPremia of LibSys provides UNICODE support and manages libraries located at different sites. LibSys also supports printing of membership cards and barcodes, additional services like SDI, CAS, email reminders, fine calculations etc. Presence of Graphical User Interface (GUI), multimedia interface and Web OPAC make the software more attractive. The Web OPAC works through PERL/CGI access mechanism and the bibliographic databases can be accessed through Intranet or Internet.

**Libraries in India using LibSys Software:** LibSys is a proprietary ILS with maximum installations in India. Library knowledge Centre of Ansal Institute of Technology, Haryana; Library of Institute for Plasma Research (IPR), Gujarat; Learning Resource Centre (LRC) of Indian School of Business (ISB), Mohali; Library of Indian Institute of Astrophysics (IIAP), Bangalore; Library of Vallabhbhai Patel Chest Institute (VPCI), University of Delhi, Delhi; Justice T.P.S. Chawla Library of National Law University, New Delhi; Central Library, Central University of Rajasthan; Library and Resource Centre of GD Goenka University Gurgaon; Central Library of Amity University, Lucknow; Dr. V K R V Rao Library of Institute for Social and Economic Change (ISEC), Bengaluru; Library of Raman Research Institute (RRI), Bengaluru; Library & Information Centre of Maharaja Institute of Technology (MIT), Mandya; Library & Information Centre (LIC) of Indian Institute of Management Kozhikode (IIMK), Kerala; Library of International Institute of Health Management Research (IIHMR), New Delhi; Library of Maharashtra Animal & Fishery Sciences University (MAFSU), Nagpur; B. C. Roy Memorial Library of Indian Institute of Management Calcutta (IIM Calcutta); Central Secretariat Library (CSL), New Delhi; University Library of Kerala University; RGNUL Library of Rajiv Gandhi National University of Law (RGNUL) Punjab; Library of Surat Municipal Institute of Medical Education and Research (SMIMER), Surat; Central Library of Tezpur University; Library of Mahatma Gandhi State Institute of Public Administration, Punjab; Central Library of Scholar's Institute of Technology and Management (SITM), Guwahati; Library and Documentation Centre of National University of Educational Planning and Administration (NUEPA), New Delhi; Library of Siksha 'O' Anusandhan University (SOA University), Orissa; Lakshminath Bezbaroa Central Library of Indian Institute of Technology Guwahati (IIT Guwahati), Guwahati; Central Library of BIT Mesra

Campus, Birla Institute of Technology, Ranchi; Information Centre for Aerospace Science and Technology (ICAST) of CSIR-National Aerospace Laboratories (CSIR-NAL), Bengaluru; Bhai Kahn Singh Nabha Library (BKSN Library) of Punjabi University; Library and Information Resource Center of ITM University, Gurgaon; Library of Birla Institute of Technology and Science, Pilani, Rajasthan; Ananda Rangapillai Library of Pondicherry University; Technical Information Centre (TIC) of Defence Metallurgical Research Laboratory (DMRL), Hyderabad; Library of French Institute of Pondicherry; Central Library of National Institute of Technology Delhi (NIT Delhi); P K Kelkar Library of Indian Institute of Technology (IIT Kanpur); Central Library of Vellore Institute of Technology (VIT) University; Visva-Bharati Library Network of Central Library, Visva-Bharati, West Bengal; Library of Gujarat National Law University (GNLU); Library of Jaipuria Institute of Management, Lucknow; Library of National Remote Sensing Centre (NRSC), Hyderabad; Library of National Institute of Bank Management Pune; Learning Resource Centre (LRC) of Indian Institute of Management Tiruchirappalli (IIM Trichy); Knowledge and Information Center of National Institute of Technology (NIT) Sikkim; S.N. Bose National Centre for Basic Sciences (SNB Library), Kolkata; Library of National Institute of Virology, Pune; Dr Zakir Husain Library (Central Library) of Jamia Millia Islamia, New Delhi; Library of The Indian Law Institute (ILI), New Delhi; Central Library of Indian Statistical Institute, Kolkata; Biju Patnaik Central Library of National Institute of Technology (NIT), Rourkela; Scientific Information Resource Division (SIRD) of Indira Gandhi Centre for Atomic Research (IGCAR), Tamil Nadu; Automotive Research Association of India (ARAI) Knowledge Centre (Library), Pune; University Library of Kalinga Institute of Industrial Technology (KIIT University), Odisha; EXIM - Knowledge Centre of (Export-Import Bank of India), Mumbai; Library of National Institute of Science Education and Research (NISER), Bhubaneswar; K N Raj Library of Centre for Development Studies (CDS), Kerala; Library of Acharya Institute of Management and Sciences (AIMS), Bengaluru; Library of Dr. YSR National Institute of Tourism and Hospitality Management, Hyderabad; Library of Competition Commission of India (CCI), New Delhi; Central Library of PEC University of Technology, Chandigarh; Knowledge Resource Centre (KRC) of Central Electrochemical Research Institute (CERI), Tamil Nadu; Library of Management Development Institute (MDI), Gurgaon; Library of Gujarat

Institute of Development Research (GIDR), Ahmedabad; Knowledge Center & Information Services of JK Business School, Gurgaon; Technical Information Resource Centre (TIRC) of Armament Research & Development Establishment (ARDE), Pune; Central Library of Indian Institute of Technology Ropar, (IIT Ropar), Punjab; Dr. O.P. Bhalla Central Library of Manav Rachna International University (MRIU), Delhi; Central Library of Mangalayatan University, Aligarh; Central Library of International Institute of Information Technology (IIIT-H), Hyderabad; Selaqui International School (SIS) Library, Dehradun; Central Library of National Institute of Technology Karnataka; Library and Information Services of Space Applications Centre (SAC), Indian Space Research Organization (ISRO), Ahmedabad; Central Library of Central University of Karnataka, Jadavpur University Library, Kolkata; Central Library of Tecnica Group of Institutions, New Delhi; Library of National Institute of Epidemiology (NIE), Chennai; Central library of Gulbarga University; Knowledge Resource Center of Central Leather Research Institute (CLRI), Chennai; Knowledge Resource Centre Publication (KRC) of CSIR-Central Institute of Medicinal and Aromatic Plants (CIMAP), Lucknow; Library of Advanced Data Processing Research Institute (ADRIN), Hyderabad; Library of Indian Institute of Science Education and Research (IISER), Pune; Library and Documentation Division (Central Library) of Devi Ahilya Vishwavidyalaya (DAVV), Indore; Library and Documentation Division (LDD) of Liquid Propulsion Systems Centre, Indian Space Research Organisation, Kerala; Central Reference Library of Government of India, Kolkata; Central Library of National Institute of Technology, Kurukshetra (NIT Kurukshetra) and Library of Reserve Bank of India (RBI), Mumbai are libraries using LibSys software.

#### ***4.3.14 Maitreyi***

It is also an ILS package developed in India. The software is designed and developed by Computer Maintenance Corporation of India (CMC), Calcutta as part of the engagement with the project of Calcutta Library Network (CALIBNET). The software can handle all the basic house-keeping operations of a library. The software is managed by a commercial agency and can be purchased from CMS, Calcutta. The software is known as the one which is developed in India for library network program, providing specific

network and communication facilities. The package has been developed on INGRES as the underlying framework and works on UNIX platform (Saxena & Srivastava, 1998).

#### **Libraries in India using Maitreyi Software: NA**

##### **4.3.15 ModernLib**

**Responded Libraries in India using ModernLib Software:** Central Library of Anand Institute of Higher Technology (AIHT), Kazhipathur, Tamil Nadu; Central Library of United Institute of Technology (UIT), Coimbatore, Tamil Nadu; Central Library of Kalasalingam University, Krishnankoil, Tamil Nadu and Central Library of SVS College of Engineering, Coimbatore, Tamil Nadu are its users.

##### **4.3.16 Nirmals**

Nirmals (Network Information Resources Management of Academic Library System) is commercial library automation software of Indian origin with modules for acquisition control, bibliography control, circulation control, serials management, Online Public Access Catalogue, general utilities, self-charge system, gate entry monitor, WebOPAC, digital repository, advanced management system, systematic mapping of internet, learning e-resources etc.

Nirmals is a high performance library management system, with modern capabilities built from long experience. NICE (an acronym for Nirmal Inter Collegiate Extension) provides an end-to-end solution that is easy to deploy, manage and use. The software is more suitable for medium type libraries. It includes facilities for inter-library loans, selection, stock rotation, newspaper indexes, homebound borrowers, archives, self-service and data loading. In addition to managing bibliographic data, NIRMALS caters for multimedia collections, community information, historical archives and artefacts, and abstracts or full text management (Nicesoft, 2015). The software is developed by Nirmal Institute of Computer.

**Libraries in India using Nirmals Software:** Library of Rane Polytechnic Technical Campus, Tiruchirappalli, Tamil Nadu; Annamalai University Library,



Chidambaram, Tamil Nadu; Central Library of Dharmaram Vidya Kshetram (DVK), Bengaluru and Rosa Mystica Library of Fatima College, Tamil Nadu.

#### **4.3.17 Rován LMS**

Rovan Library Management System (Rovan LMS) is a commercial library automation software designed and developed by Rován Technologies, Sivakasi, Tamil Nadu. The software has major functional modules such as Acquisition, Catalogue, Circulation, OPAC, Serials management, OPAC, Administration modules and E-Gate. E-Gate module in the software records the entry and exit of the users in the library. The software is suitable for libraries such as school, college, public and business libraries. Rovan LMS Gold, Silver and Bronze are the three editions of the software.

**Libraries in India using Rován LMS Software:** Library, Loyola College, Vettavalam, Tamil Nadu, Library of Rajapalayam Rajus' College (RRC Library), Rajapalayam, Tamil Nadu, Library of St. Xavier's College of Education, Tirunelveli, Tamil Nadu.

#### **4.3.18 SANJAY**

SANJAY is a library management software developed by DESIDOC under a NISSAT project by incorporating an additional module for the library housekeeping application on CDS/ISIS (Ver 2.3). The software consists of modules such as Acquisition, OPAC and Circulation. 2.0 version of SANJAY software runs on MS DOS version 3.02 or above. The software supports textual information in Indian scripts and can handle numeric operations like calculation of budgeting allocation and expenditure. SANJAY software is also featured with adding or inserting a new module in between the existing menus without affecting their functions. The package is marketed by NISSAT, New Delhi at nominal price. Sanjay software has been implemented in many Indian libraries. However, Technology Bhawan Library and Indian Oil Corporation (IOC) (R&D) libraries, New Delhi are some of the major libraries, where this software is being used (Saxena & Srivastava, 1998).

**Libraries in India using SANJAY Software: NA**

#### **4.3.19 SLIM**

System for Library Information Management (SLIM) is an ILS, which automates many of the library's day-to-day functions. It is developed by Algorithms Consultants Pvt. Ltd. Pune, Maharashtra.

**Libraries in India using SLIM Software:** Library of Capgemini (consulting, technology, outsourcing services), Hyderabad, Telangana; Library of Maharshi Dayanand College, Mumbai; Library of Gopaldas Jhamatmal Advani Law College (GJALC), Mumbai; The Shantarakshita Library of Central University of Tibetan Studies, Uttar Pradesh; Library of Tolani Maritime Institute, Pune; University Library of Mahatma Phule Krishi Vidyapeeth, Maharashtra; BrahMos Aerospace Knowledge Centre, Hyderabad; Library and Documentation of Indian Institute of Geomagnetism, Mumbai; Learning & Information Resource Centre (LIRC) of St. Francis Institute of Management and Research (SFIMAR), Mumbai; A. C. Joshi Library of Panjab University, Chandigarh; Central Library of Maharashtra Institute of Medical Sciences and Research (MIMSR), Latur; Library of Tolani College of Commerce, Mumbai; Library of International Institute for Population Sciences (IIPS), Mumbai; Library of Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune; Dhananjayrao Gadgil Library of Gokhale Institute of Politics and Economics (GIPE), Pune; Sir Dorabji Tata Memorial Library of Tata Institute of Social Sciences (TISS), Mumbai; Library of AISSMS College of Engineering (AISSMS-All India Shri Shivaji Memorial Society), Pune; Library of H R College of Commerce & Economics, Mumbai; Laxmiben Thackersey Library of Sir Vithaldas Thackersey College of Home Science, Mumbai; Administrative Staff College of India (ASCI), Hyderabad; Central Library of Vishwakarma Institute Of Information Technology (VIIT), Pune; Library of Podar International School (IB & CIE) – Secondary Section, Mumbai; Central Library of Government Polytechnic Mumbai; Library of Dr. Harvansh Singh Judge Institute of Dental Sciences & Hospital (Dr.HSJIDS), Chandigarh The Library and Information Centre (LInC) of Nagindas Khandwala College (NKC), Mumbai and Library of Infosys, Bangalore are some of the libraries in India using SLIM software who have responded to the survey from among those using the package.

#### **4.3.20 SOUL**

Software for University Libraries (SOUL) promoted by Government is also one of the highly used ILS packages in India. It is an ILS initially designed and developed by the INFLIBNET in collaboration with DESIDOC in both DOS and UNIX versions mainly for university libraries. Later INFLIBNET modified the software to Windows based system with the use of both Relational Database Management System (RDBMS) and Client-server architecture based system which is suitable not only for University libraries but also for any size and type of libraries. SOUL consists of acquisition, cataloguing, circulation, OPAC, serial control and administration modules. Software uses Java programming language and supports bibliographic and cataloguing standards like CCF & AACR II and also LAN & WAN environment. SOUL use ISO 2709 for exporting and importing data and has GUI based user interface. The software also provides multilingual supports and searches can be done using web enabled OPAC. SOUL is known for its third generation features and facilities and is the only fully developed software of its kind from the Government sector and is much cheaper than any other commercial ILMS with advanced features. The software is distributed to university libraries at nominal cost and the network feature of SOUL software enables multiple university libraries to function together. Exhaustive training, technical assistance, installation assistance, with comprehensive manual given by INFLIBNET centre attract universities to adopt the software without much effort.

**Libraries in India using SOUL Software:** Library of Institute of Distance and Open Learning (IODL), Gauhati University, Assam; Library of Kerala University of Fisheries and Ocean Sciences (KUFOS), Kerala; Library of College of Veterinary and Animal Sciences, Kerala; Vartak College Library, Maharashtra; Hari Narain Knowledge Resource Centre of CSIR – National Geophysical Research Institute (NGRI), Hyderabad; Central Library of Kannur University, Kerala; Library of Islamia College of Science & Communication, Srinagar; Department of Library and Information Science of Colleges of Arts & Commerce, Andhra University, Andhra Pradesh; Central Library of Maharajah's College of Pharmacy, Andhra Pradesh; Department of Library and Information Science, Alagappa University, Tamil Nadu; Library of College of Horticulture, Kerala Agricultural University, Kerala; Library of Pandu College, Guwahati; Central Library of Krishna Kanta

Handiqui State Open University (KKHSOU), Guwahati; Central Library of University Institute Of Technology, The University of Burdwan, Burdwan; Library of Agasti Arts, Commerce & Dadasaheb Rupwate Science College, Ahmednagar; Central Library of Sayaji Rao Gaekwad Library, Banaras Hindu University Campus, Varanasi; Central Library of TKM College of Engineering (TKMCE), Kerala; Library of Shri Parshwanath Ummed Jain (S.P.U. (P.G.)) College, Rajasthan; Smt. Hansa Mehta Library of the Maharaja Sayajirao University of Baroda, Vadodara; Guindy Campus Library of University Of Madras, Tamil Nadu; Library of Swami Ramanand Teerth Marathwada University (SRTMU) , Maharashtra; Central Library of Central University of Gujarat; Library of Vidyasagar College, Kolkata; Library of IPS Academy Indore, Madhya Pradesh; Library of College of Technology and Engineering, Maharana Pratap University of Agriculture and Technology (MPUAT), Rajasthan; Library of Department of Library and Information Science, Dravidian University, Andhra Pradesh; Library of Bineswar Brahma Engineering College (BBEC), Assam; Library of Information and Library Network (INFLIBNET), Gujarat; Central Library of Guru Ghasidas Vishwavidyalaya, Chhattisgarh; Central Library of Maharaj Vijayaram Gajapati Raj College of Engineering (MVGR College of Engineering), Andhra Pradesh; Central Library of Dr. B. R. Ambedkar University, Agra; J N Library of University of Mumbai; Central Library of Indian Institute of Technology Gandhinagar (IIT Gandhinagar); Central Library of University of Kota; Sri Venkateswara University, Tirupati and Raksha Shakti University Library of Raksha Shakti University, Gujarat are some of the libraries using SOUL as their ILS software who have responded to this survey.

#### **4.3.21 SUCHIKA**

The integrated library management system named SUCHIKA was developed by DESIDOC for its labs under Defense Research and Development organization (DRDO) in 1996. Being indigenous software, the price of the software is moderate and is available in DOS version for small libraries and UNIX version for both medium and bigger libraries. SUCHIKA consist of modules like acquisition, circulation, cataloguing, OPAC and serial control and these modules can be implemented one by one or together. The C++ programming language is used in the software development and it follows B-Tree techniques for data storage. The software is compatible with international standards like

CCF, AACR II, ISO 2709 for data exchange. The data conversion from Computerized Documentation System/ Integrated Set for Information Systems (CDS/ISIS) is very much possible in this software.

The package is used in many Indian libraries and Technology Information Centers. Both its DOS and UNIX versions have been implemented at Defense Science Library, New Delhi. DESIDOC has also decided to offer this package to non-DRDO libraries at nominal prices to help them in their automation (Saxena & Srivastava, 1998).

**Libraries in India using SUCHIKA Software:** Among the responded libraries there is no library using this software. However from the normal and informal discussions and interviews conducted as part of this study it was found that Knowledge Resource Centre (KRC) of Defence Scientific Information and Documentation Centre (DESIDOC), New Delhi and Directorate of Management Information System and Technologies of Defense Research and Development Organization (DRDO) New Delhi were using this software earlier.

#### **4.3.22 Troodon**

Troodon is a commercial Integrated Library Software for Library Automation. The software has modules for acquisition, circulation, Online Public Access Catalogue (OPAC), serials control, maintenance and administrative setups. Troodon software service is provided by Comtek Pvt Ltd, Malviya Nagar, New Delhi. The software supports CCF standard to import/export data. It is a multi-user library software package in Windows NT/Novell Netware Server. Following are the specifications given by the software producer. The package as per the developer statement has easy to use Graphical User Interface, on screen preview of all reports before print, provides export facility for most reports to PDF, Excel, Word etc., has provision for Unicode support with Multilingual Search, has analysis and reports in 3-D Bar and Pie charts, menu level security, personalized language for purchase orders, reminders and email messages, customized rules of circulation and an inbuilt email editor to facilitate users to add external attachments and special instructions in auto generated messages. It uses MS-SQL 2008 database or MS SQL 2008 Express and above as backend (Comtek Services Pvt Ltd, 2015).

**Libraries in India using Troodon Software:** University Library of Gurukula Kangri Vishwavidyalaya Haridwar; South Delhi Campus Library of University of Delhi, New Delhi; University Information Resources Centre (UIRC) of Guru Gobind Singh Indraprastha University, New Delhi; Library & Information Centre (LIC) of Central Council for Research in Unani Medicine, New Delhi are found to be using this package.

#### **4.3.23 Virtua ILS**

Virtua Integrated Library System is internationally used automation software. It is a sophisticated ILS system designed and developed by Virginia Technology Library Solutions (VTLS) Inc., Virginia, United States of America. Some of the Indian libraries have also adopted it (Virtua, 2015). It is a flexible ILS with a Windows based Client-Server architecture and runs with Shelf-UNIX hardware, UNIX and Oracle RDBMS where the libraries can configure the software settings. The software consists of basic modules such as acquisition, cataloguing, circulation, OPAC, serial control, reports and reservations. Virtua ILS supports UNICODE standard for different languages and scripts hence ensures true multilingual catalogue database and also supports national and international standards for data interchange. The software is compatible with MARC 21 format and also supports UKMARC, USMARC, CANMARC etc.

The software ensures management of multiple libraries or branches across a library. Virtua also supports multilingual authority control, and networked multimedia database management and seamless access to multiple databases through Z39.50 client. It also provides extensive and precise control over user activities and helps creation of rich and customized web interface for various collection components for each patron class. Virtua ILS provides comprehensive customization parameters (over 1000) for global settings and each subsystem such as acquisition, cataloguing, circulation, OPAC, serial control etc. It also incorporates functional requirements for bibliographic records (FRBR) to restructure catalogue databases. The software supports development of digital library database and helps in designing web enabled digital media archiving (Gaur, 2013).

**Libraries in India using VTLS (Virtua) Software :** Library of India International Centre (IIC), New Delhi; Learning Centre of Indian Institute of Management Indore (IIM

Indore); National Library of India, Kolkata; Sahitya Akademi Library, New Delhi; Library of Indian Institute of Management Ranchi (IIM Ranchi); Indira Gandhi Memorial (IGM) Library of University of Hyderabad, Telangana; Learning Resource Centre (LRC) of Indian School of Business (ISB), Hyderabad, Telangana; Library of the Institute for Defence Studies and Analyses, New Delhi, Knowledge Management Centre of National Institute of Design (NID) Gujarat; Allama Iqbal Library of the University of Kashmir; Central Library of Jawaharlal Nehru University (JNU), New Delhi and the Library Resource Centre of Chandragupta Institute of Management, Patna are using this package.

#### **4.3.24 WILISYS**

The commercial company WIPRO developed a library information system package named as WILISYS. The software package consisted of two components namely WILJMAX (WIPRO Library Management system) and WILITRAX (WIPRO Library Abstracts system). The software is capable of performing housekeeping operations of a library as well as information storage and retrieval functions.

#### **4.4. Other Commonly Used Commercial Systems in India Libraries**

Bees Campus Soft, Delplus, e lib, I-Lib, Lib Technology (Lib Tech), Rovam LMS, TCSion, DeLAS, ECLIPSE, EZ Library, Grandha, LIBEX Software, LIPS, LSPremia, NetLib, Serasop, SMSLMS (SMS Library Management System), Vidya, Vriddhi, Aleph (Ex-Libris), Aurum, BookMagic, Book Worm, CMS, Campuslib, Cella System, DNA ERP, GLAS (Graphical Library Automation Software), InfoLibrary, Liblogger, Libmax, Libpro, Librarian, Libris, LIBRERIA, LIBWARE, Lyceum, MICM Net Solutions Library Software, MIS, MKCLs Libreria, Phoenix Informatrix LMS, QSNET, Scholar, Serosoft, SMARTCAMPUS, Softaid, Think NEXT, TLSS: Total Library Software System, Ubuntu-Erp, WEBSIM, WINSIS and WOLK SOFT TECH are found to be the other proprietary ILS used in India. But they have only one or two installations each and hence are not discussed in detail here.

#### **4.5. Conclusion**

In commercial packages for ILSs the source code of the software remains with the developer and they differ in the development and distribution environment in comparison with open source. Unlike open source, commercial ILS are finished products and distributed without much changes over time and will be static in regard to those who have once purchased it and there is no control over the evaluation process. Commercial software requires licence which demands cost and reduces the freedom. Nevertheless, the survey found that most of the earlier installations of ILS are proprietary ILS packages and some of them like LibSys have achieved wide popularity.



## Chapter 5

# OPEN SOURCE ILS IN INDIAN LIBRARIES

### 5.1. Coming of the OSLIS

The process of library automation using Integrated Library System (ILS) is growing in a rapidly increasing rate and getting much attention in Indian libraries recently. To manage different kinds of information and resources and to deal with the local requirements, libraries require sophisticated, highly qualitative and customized ILS. Selection of a suitable ILS to fulfil the local requirements of the library is not a simple task. There are many ILS available in the software industry to manage the house keeping operations and information retrieval in a library. Among the ILS available, Koha, LibSys, SOUL, SLIM, NewGenLib, AutoLib, EasyLib and e-Granthalaya are the most popular software packages used by Indian libraries.

Development of OSILS is a boon for libraries experiencing budget shortfall to cope with the exorbitant cost of the proprietary software both for its purchase and maintenance. Application of OSILS enhances the library automation process. There has been a rise in the number of libraries in India adopting or migrating to OSILS, however many libraries still work with their legacy commercial systems. It is true that libraries in India have not fully embraced the application of OSILS for library automation for fear of their efficiency and effectiveness in completely automating a library. Adoption of OSILS is an alternative to traditional licensed software, and also one of the solutions for librarians looking for ways to cut back expenses. However OSILS attracts other costs for installation, data migration, training, upgrades etc. Quite a number of Open Source Software (OSS) are used in Indian libraries as an ILS, which creates both challenges and opportunities to the library professionals. They must rely on communities to get support to solve associated problems.

OSILS are made available extensively on open source platforms, public domains, live CD/DVDs, Forums, personal blogs etc. to download, install, modify, distribute and to share their experiences and feedback, there-by enhance the quality of the software.

## **5.2. Major Initiatives in India to Encourage the Adoption of OSILS**

India has made remarkable contributions to the world of science and technology in international level. Sustaining their capabilities, requires efficient information support to research and development which necessitated automated libraries and information systems. The importance of OSILS for library automation is being slowly realized among Indian library communities. There are many initiatives and efforts from organizations, associations, individuals and Government to promote and encourage libraries to adopt OSILS. It has been observed that state governments also support and made it mandatory to adopt OSILS in libraries in their respective states as a policy measures. Table 5.1 depicts some of the important instances in regard to adoption of OSILS identified by the study.

Development of indigenous OSILS like Maithriyee, Sanjay, SOUL, e-Granthalaya, Granthalaya, Suchika, etc.by Government institutions like DESIDOC, DSIR, NIC, INFLIBNET etc. Development of Koha Live CD projects such as LibliveCD (Dr. A.R.D. Prasad, DRTC, Bangalore), KOHA GSDL Integrated Live CD (Sourceforge.net), Koha Live CD (OSS labs) etc also occurred during this period.

**Table 5.1: Major Initiatives in India to Encourage the Adoption of OSILS**

SI No	Year	Initiatives
01	2007	Delhi Public Libraries started using Koha
02	2008	a) Government of Kerala declared Koha as the official software for computerization of libraries under its control.  b) NewGenLib was declared OSS under GNU General Public License (GPL)  c) Pondicherry University has adopted Koha in the course curriculum of Master of Library and Information Sciences (MLISc).
03	2009	d) Central Library and Departmental libraries of CUSAT adopted Koha  e) Release of ABCD OSILS
04	2011	f) University of Mysore implemented Koha OSILS in their main library and other 58 libraries under the University  g) Hosting of International conference on Koha (kohacon11) in India First Asian workshop on ABCD organized in New Delhi
05	2015	h) The Kerala State Library Council (KSLC) embarked on computerizing all the affiliated public libraries using Koha software

### 5.3. List of Open Source Integrated Library System (OSILS)

OSILS can be used to increase the efficiency of library in-terms of its resource management and service management.

### 5.3.1. ABCD

ABCD stands for 'Automation des Bibliothèques et Centres de Documentation' (in French) and "Automatización de Bibliotecas y Centros de Documentación" (in Spanish), i.e. Automation of Libraries and Centres of Documentation, a newly born web based ILS from ISIS family available in the public domain and Indian libraries have started getting acquainted with this software. ABCD software was developed by merging the features of both WinISIS and Koha and can be used as ILS cum Digital Library software with UNICODE capability and the software runs on Windows and Linux. The software is available in different languages such as English, Portuguese, Spanish, French etc. As it is UNICODE compliant, it can be adopted for any Indian language very easily.

ABCD is developed by BIREME (WHO, Brazil) in association with the VLIR (the Flemish Interuniversity Council, Belgium during 2009 (ABCD, 2015). The software provides automation functions for conventional libraries as well as documentation centres and can be used in small and large libraries. Major modules are available, such as cataloguing module for books and serials, acquisitions, circulation, statistics, OPAC, and services like barcode and spine labels printing, quality control, SDI, attachment of table of contents etc. The software is multilingual in nature and the technology used is based on CDS/ISIS database and is compatible with the programming languages such as PHP, Java, Javascript, etc. ABCD consists of web based OPAC and supports copy cataloguing of records from different catalogues including Z39.50. The software also facilitates simple and advanced search features for the end users and supports international standards in maintaining bibliographic information on MARC format apart from the other standards like CEPAL, AGRIS etc. and has advanced serials management and circulation modules. It has excellent indexing and retrieval features 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 and physical documents and media (Dhamdhare, 2011). The version 2.0 allows full-text indexing of all types of electronic documents. In the demo 'Site' scientific abstracts and full-text databases (e.g. the largest Latin-American literature database SciELO) are included to show how to deal with e-Discovery.

ABCD is a relatively new OSILS with growing community participation. The software is independent of metadata standards and thereby gives more flexibility compared to other software. Cataloguing of books and serials can be accommodated in any formats such as MARC, LILACS, AGRIS, etc. and various types of materials can also be accommodated. ABCD is platform independent and can run on both Windows and Linux platforms and is multilingual in nature. The web based OPAC system helps end user in searching the catalogue. Software is compatible with CDS/ISIS database technology for managing the bibliographic databases and provides SDI and barcode printing services. ABCD allows importing bibliographic records from other library catalogues. Users can perform online reservation of library materials and can view their loan status. There have been only five releases during September 2008 to Oct. 2014. This shows that despite active user community of ABCD software, the release activity of the software is comparatively low (Londhe and Patil, 2015).

**Year of first release** : 2009

**Software license** : GNU Lesser Public License (LGPL)

**Modules** : Acquisition, Cataloguing, Circulation, OPAC and Database, Administration, Site with Metasearch etc.

**Latest version** : 2.0

**Community** : <http://lists.iccisis.org/listinfo/isis-users>

**Present status** : Active

**Libraries Using the ABCD Software:** No libraries in India are extensively using ABCD software. Modern College of Arts, Science and Commerce, Ganeshkhind, Pune, Maharashtra, India and CSIS Library, Thiruvananthapuram, Kerala were the two libraries responded from India using the software.

### 5.3.2. AMLIB

AMLIB is windows based ILS suitable for public, special, academic and corporate libraries. The software has a customisable multiple WebOPAC interfaces such as advanced OPAC and Junior OPAC and uses Z39.50 protocol to search and retrieve information with an extensive and federated search facility. The software also complies with a wide variety of bibliographic and cataloguing standards such as MARC21, MARCXML, Z39.50 etc.

AMLIB supports electronic data, images and documents with a facility to search them in full text and operates on Client/Server environment. Library members can do online renewals, view their history and can submit requests and the software has provision to make suggested new reading based on SDI profile. Software has options for online ILL requests

**Year of first release** : 1994

**Software license** : Information is not available

**Modules** : Orders and Finance, Circulation, Catalogue, OPAC, Patron Maintenance, Authority Control, Periodical, Reports and Statistics

**Latest version** : Information is not available

**Community** : Information is not available

**Present status** : Inactive

**Libraries Using the AMLIB Software:** Information is not available

### 5.3.3. AtheniumLight

An OSILS developed in 2002 in New Zealand by SumWare Consulting Company. The software was best suited software for school libraries and able to handle large bibliographical data records. It consisted of modules for circulation, cataloguing and OPAC. However in 2007 the developer of the software withdrew it from the Open Source tag.

**Year of first release** : 2002

**Software license** : Information is not available

**Modules** : Circulation, Cataloguing and OPAC

**Latest version** : Information is not available

**Community** : Information is not available

**Present status** : Inactive

**Libraries Using the AtheniumLight Software:** Information is not available

#### 5.3.4. AVANTIMicroLCS

Avanti or Avanti MicroLCS is an ILS developed by Avanti Library Systems by a single person, Peter Schlumpf, Systems Administrator of North Suburban Library Systems, Illinois. The software was released in the year 2003. It was free software for library automation when the 1.0 version of the software released and licensed under GNU General Public License, but the source code of the software was protected by the licence agreement thereby modifications and customizations were not possible. However the version 2.0 of the software made it as proprietary. It is a platform independent ILS written in Java and is more suitable for small libraries since the software is limited to record 128000 titles and 256000 items only. The software is simple and easy to install with a flexible architecture. The ILS supports MARC as a standard for bibliographic recording and Z39.50 standards and can run on any system that supports a java run time environment. The software is available in both open and commercial versions; however literature shows that no library in India is using this software. The software released its circulation modules in the year 2003 and became popular with the name Avanti Circulation System; however there were no updates and developments after 2007. The latest version of the software is 1.0.2 released in 2007 and the mailing community and discussion list of the software is presently inactive.

<b>Year of first release</b>	: 1998
<b>Software license</b>	: GNU General Public License
<b>Modules</b>	: Circulation, Cataloguing and OPAC
<b>Latest version</b>	: 1.0.2
<b>Community</b>	: Information is not available
<b>Present status</b>	: Inactive

**Libraries Using the AVANTIMicroLCS Software:** Information is not available

#### 5.3.5. BiblioteQ

It is a free software suitable for small libraries and developed in 2005, but the source code is not available to the public. The software is released under BSD license and has two versions viz. desktop version and online version and consists of cataloguing and circulation

modules in its desktop version, which is easy to install and OPAC module in its online version to perform the library activities. The software used the SRU and Z39.50 protocols to retrieve data from its database and use a Qt interface to provide connectivity to PostgreSQL and SQLite so that the software is compatible with any system that supports Qt. Software runs on Windows, Mac OSX and LINUX platforms and use Z39.50 protocols to retrieve data. It supports architecture developed by Advanced RISC Machines (ARM). The software support MARC format and has option to attach digital versions of books, journals, images etc. The circulation module of the software is not well developed, but the software is updated frequently with a team of active community and the latest development can be seen in the year July, 2016 with the release of its updated version 2016.07.04. The software has realised around 150 versions as of 2016 since its first release.

**Year of first release** : 2005

**Software license** : Information is not available

**Modules** : Cataloguing, Circulation and OPAC

**Latest version** : 2016.07.04

**Community** : <https://github.com/textbrowser/biblioteq/issues>

**Present status** : Active

**Libraries Using the BiblioteQ Software:** NA

#### **5.3.6. CDS/ ISIS and WINISIS**

The acronym CDS/ISIS stands for Computerized Documentation System / Integrated Set of Information System. The software is a non profit and free library software developed by the division of software development application office of information programs and services of UNESCO. CDS/ISIS is a text-retrieval package with cataloguing facility to store bibliographical information. It is available free of cost however it was not an OSS till 2005. The CDS/ISIS is a powerful information storage and retrieval system developed by UNESCO available free but not under open source license terms and conditions, and is heavily used only to catalogue library collections (Barve and Dahibhate, 2012). The installation of the software is simple and is available in various languages such as English, French, Arabic, Chinese, German, Portuguese, Russian and Spanish etc. Some



local groups have developed many Indian language versions also and an example is Malayalam. CDS/ISIS started as DOS based software which originated from the ILO ISIS family. Windows version of the software is available to the public named as WinISIS software but lacks many functions of a typical OSILS. This windows version of the CDS/ISIS was created to make it compatible with the windows operating system and the first version was tested in the year 1995. In 1998, the 1.31 version of the software was released and is considered as the official version of the WinISIS software. (CDS/ISIS database software, 2015). Though CD/ISIS does not meet all the characteristics of a typical ILS, it helps to develop automation software packages that are built based on it like WINISIS, GENISIS, SANJAY, ABCD etc.

<b>Year of first release</b>	: 1995
<b>Software license</b>	: Information is not available
<b>Modules</b>	: Cataloguing, Circulation and OPAC
<b>Latest version</b>	: Information is not available
<b>Community</b>	: Information is not available
<b>Present status</b>	: Active

**Libraries Using the CDS/ ISIS or WINISIS Software:** Kerala Forest Research Institute (KFRI), Kerala; Centre for Informatics Research and Development (CIRD) and Centre for South Indian Studies (CSIS), Kerala

### 5.3.7. EMILDA

Emilda is an OSILS developed by Company Cube (earlier known as Realnode Limited) (Emilda, 2015). The software was developed in the year 2003 and not updated after 2008. The software is developed in XML, written in PHP and is highly scalable. The software has modules such as circulation and OPAC along with the module for administration functions. The software uses Zebra in conjunction with MySQL which makes it compatible with MARC standard and Z39.50 and support flexibility in customization. The software is licensed under GNU General Public License version 2.0 (GPLv2). The user interface of the software is easily customizable due to its template-based

layout. The software is highly recommended for school libraries by the developer, however no libraries in India are found to be using this software for their library automation. There has been no development in the software after 2007.

<b>Year of first release</b>	: 2003
<b>Software license</b>	: GNU General Public License version 2.0 (GPLv2).
<b>Modules</b>	: Circulation, OPAC and Administration
<b>Latest version</b>	: Information is not available
<b>Community</b>	: Information is not available
<b>Present status</b>	: Inactive

**Libraries Using the EMILDA Software:** Information is not available

#### 5.3.8. Espabiblio

Espabiblio is an ILS developed under GNU General Public License version 2.0 (GPLv2) as a modified version of OpenBiblio 7.1 to perform the basic operation of library house-keeping. It consists of circulation, cataloguing, OPAC, administration and report generation modules to perform the basic operations. However it lacks acquisition and serial control modules. The software is developed mainly for libraries in the Spanish speaking countries hence the name of the software is Espabiblio meaning 'Library in Spanish'. Some of the new features added in this system are, presentation of cover images, display photos of members, implemented search via Z93.50, ability to upload and download digital materials and other minor changes (Londhe and Patil, 2015). The software is platform independent and supports any operating system with Apache, PHP and MySQL contains CMS based on Word Press. The software supports MARC standard. Though the release activity of the software is active, community activity and support activity are comparatively low.

<b>Year of first release</b>	: 2012 (Espa 2.2 B-2)
<b>Software license</b>	: GNU General Public License version 2.0 (GPLv2)
<b>Modules</b>	: Circulation, Cataloguing, Administration, OPAC and Reports
<b>Latest version</b>	: 3.3

**Community** : Information is not available

**Present status** : Active

**Libraries Using the Espabiblio Software:** Information is not available

#### **5.3.9. *Evergreen***

The development of Evergreen ILS was started in 2006 for a public library consortium in Georgia; named Georgia's Public Information Network for Electronic Services (PINES) and was launched in the year 2007 licensed under GNU General Public License. The software is developed for very large consortium of small public libraries and offers applications to cover most of the library activities. The Evergreen software is used to a greater extent in school and public libraries in USA and Canada and the software is suitable for small and large libraries of all types. Michigan is another consortium which spreads the implementation and usage of Evergreen in South Carolina, Canada, Indiana, and Washington. The language used for the software is Pearl and the infrastructure components written in C language. The database is PostgreSQL and web server used is Apache. This ILS supports standards such as MARC 21, Z39.50 (Client & Server), Unicode 3.0, SRU/W (Client & Server), ISO 2709 (MARC communications format), Dublin Core, MODS, OAI-PMH. Equinox Software, Inc. is the key supporter company of the software. The software is built on OpenSRF (Open Scalable Request Framework) framework.

**Features:** Evergreen is the first consortially viable OSILS software containing the functional modules such as catalogue, circulation, acquisition, serials control, administration modules, authority control, reporting and the Online Public Access Catalogue (OPAC) modules, which allows the users to search with keywords using its multiple boxes available in the advanced search page. Evergreen lacks interlibrary loan module. There are many vendors and companies offering installation, migration and customization supports on the software.

Those libraries which concentrate on technical processing, circulation and OPAC as the key modules for automation activity can consider Evergreen as a product for ILS.

**Year of first release** : 2006

**Software license** : GNU General Public Licence

<b>Modules</b>	: Cataloguing, Circulation, Acquisition, Serials Control, Administration modules, Authority control, Reporting module and OPAC
<b>Latest version</b>	: 2.9.0
<b>Community</b>	: <a href="http://evergreen-ils.org/communicate/">http://evergreen-ils.org/communicate/</a>
<b>Present status</b>	: Active

**Libraries Using the Evergreen Software:** According to the official website of Evergreen, Indian Institute of Science Education and Research, Thiruvananthapuram (IISER-TVM) is the only library using Evergreen software in India (Evergreen Libraries, 2015).

#### **5.3.10. e-Granthalaya**

e-Granthalaya is one of the successfully used web based automation software released in 2009 as freeware, with an active development status in small and medium sized libraries in India. National Informatics Centre (NIC) under the Department of Electronics and Information Technology, Ministry of Communications and Information Technology, Government of India (GOI) supports the installation, maintenance and training of e-Granthalaya software (e-Granthalaya, 2015). Though the software does not meet all the characteristics of OSS where the source code of the software is restricted to the public or user, access permissions to the users on various modules have been given. Based on the request from the Government libraries, Departments libraries, Public libraries and Academic libraries etc. the software is being provided free of cost. However the charges for data migration, customization, training etc. are required to be borne by the individual libraries. The software consists of major modules for acquisition, cataloguing, circulation, serial management, OPAC and report generation. It can generate customized reports and statistics. e-Granthalaya software provides multilingual support for data storage and retrieval and can be customized to suit all Indian languages. The software supports MARC and Z39.50 formats and uses MS SQL Server 2000/2005 standard edition for data storing. e-Granthalaya supports both standalone and networked mode of operations. The WebOPAC are installed on the server PC and can be accessed through IIS web server and

apart from web enabled searching, the OPAC also consists of simple and advanced search options. However, the data entry program is installed on client PCs. The software does not support RFID integration and Linux Operating System. However the software has released its latest enterprise version 4.0 which is web enabled with advanced features. e-Granthalaya is UNICODE compliant hence support data entry in local languages.

<b>Year of first release</b>	: 2003
<b>Software license</b>	: Information is not available
<b>Modules</b>	: Acquisition, Cataloguing, Circulation, Serial Management, OPAC and Report Generation
<b>Latest version</b>	: 4.0 (Enterprise Edition)
<b>Community</b>	: <a href="http://egranthalaya.nic.in/support.aspx">http://egranthalaya.nic.in/support.aspx</a>
<b>Present status</b>	: Active

**Libraries Using the e-Granthalaya Software:** EIILM University, Sikkim; Anand College of Engineering & Management (ACEM), Punjab; PVDT College of Education, Mumbai; Govt. First Grade college, Chikkaballapur, Karnataka; Guru Nanak Dev Engineering College (GNDEC), Ludhiana; Biological Sciences, Indian Institute of Science, Bengaluru; Kendriya Vidyalaya Khammam, Andhra Pradesh; Administrative Training Institute (ATI), Mysuru; National Institute of Fashion Technology (NIFT), Hyderabad; Udayanath Autonomous College of Science and Technology, Cuttack; Government First Grade College (GFGC), Uttara Kannada; Vivekananda Institute of Technology (VKIT), Bengaluru; Kendriya Vidyalaya (KVS) Karimganj, Assam; Ministry of Earth Sciences, New Delhi; Sai Nath Group of Education, Agra (UP); Government First Grade College Tumkur, Karnataka; Sapthagiri College of Engineering, Bengaluru; Kendriya Vidyalaya Umroi Cantt., Shillong, Meghalaya and PDM College of Engineering, Haryana are institutions using this packages among the respondents.

### **5.3.11. FireFly**

FireFly is an ILS released by Free Software Foundation, Inc., in March 2003 to support public libraries. The software is licensed under GNU General Public License

version 2.0 and consists of cataloguing, circulation and OPAC modules to perform the basic house-keeping operations of the library. The software is written in Python, Perl, and XML is used to store the data. Koha has absorbed all the features of FireFly and added facilities it lacked.

<b>Year of first release</b>	: 2002
<b>Software license</b>	: GNU General Public License version 2.0
<b>Modules</b>	: Cataloguing, Circulation and OPAC
<b>Latest version</b>	: 2.0
<b>Community</b>	: Information is not available
<b>Present status</b>	: Inactive

**Libraries Using the FireFly Software:** Information is not available

#### 5.3.12. Glibms

Glibms or GNU Library Management System is library management software released in 2001 and there is no update for the software after 2002. The software is developed using PHP and PostgreSQL and is licensed under GNU General Public License (GPL) and there is not much information about the software available anywhere other than the installation documentation. The first version of the software is released in 2001 and the latest available version 0.0.7 of the software was released in 2002 with its installation documents. The project seems to be inactive after 2002 and there is no active version release, user community or mailing communications and developer community.

<b>Year of first release</b>	: 2001
<b>Software license</b>	: GNU General Public License
<b>Modules</b>	: Information is not available
<b>Latest version</b>	: 0.0.7
<b>Community</b>	: Information is not available
<b>Present status</b>	: Inactive
<b>Libraries Using the Glibms Software:</b> Information is not available	

### 5.3.13. Gnuteca

Gnuteca is free software developed by Solis, Cooperative Free Solutions in Brazil (Gnuteca, 2015). The software is released under CC-GNU General Public Licence and consists of cataloguing and circulation and the interface of the software is written in Portuguese language. The software was developed using CDS/ISIS technology hence support ISIS and MARC21 formats which helps easy migration of resources into other software. The software is suitable for any kind of library and has all the modules to perform the basic functions of library. Gnuteca can run only in LINUX platform and the programming languages used are PHP and Pearl.

<b>Year of first release</b>	: 2002
<b>Software license</b>	: Information is not available
<b>Modules</b>	: Cataloguing and Circulation
<b>Latest version</b>	: Information is not available
<b>Community</b>	: Information is not available
<b>Present status</b>	: Inactive

**Libraries Using the Gnuteca Software:** Information is not available

### 5.3.14. GPL Library System

GPL Library System is an ILS developed in 2010 and released under GNU General Public License version 3.0 (GPLv3). However there is no further development statistics of the software after its latest version 3.2 released in the same year. The software has functional modules of Catalogue and OPAC and a Circulation module with limited functionalities. There is no information on its user community, developer community and discussion forums.

<b>Year of first release</b>	: 2010
<b>Software license</b>	: GNU General Public License version 3.0 (GPLv3)
<b>Modules</b>	: Catalogue, Circulation and OPAC
<b>Latest version</b>	: 3.2

**Community** : Information is not available

**Present status** : Inactive

**Libraries Using the GPL Library System Software:** Information is not available

#### **5.3.15. InfoCID**

INFOCID Library is an ILS developed in 2005 in Spanish language. The software package can manage any kind of library and has modules such as administration, loan repayment, statistics, consultation and inventory management to support the house-keeping activities. The latest version available for this software is version 3.2 and there is no active developer community, user community and discussion forums.

**Year of first release** : 2005

**Software license** : Information is not available

**Modules** : Administration, consultation, Loan repayment, Inventory Management and Statistics

**Latest version** : 3.2

**Community** : Information is not available

**Present Status** : Inactive

**Libraries Using the InfoCID Software:** Information is not available

#### **5.3.16. Jayuya**

Jayuya is also called as Jayuya THEY. It is an ILS developed in French and released under GNU General Public License (GNU GPL). The software consists of basic functional modules to perform circulation, cataloguing, reports and statistics. There are no development activities such as developer community, user community, mailing list or forum or download statistics since 2005.

**Year of first release** : 2005

**Software license** : GNU General Public License (GNU GPL)

**Modules** : Catalogue, Circulation, Reports and statistics

**Latest version** : Information is not available

**Community** : Information is not available



**Present status** : Inactive

**Libraries Using the Jayuya Software:** Information is not available

#### **5.3.17. Kobli Koha**

Kobli Koha is a web based OSILS developed based on Koha ILS. Kobli Koha differ from KOha in terms of ability to add a number of features to Koha module. Koha Kobli developed a digital repository and improvements in its cataloging module keeping the same features of Koha. The software is rich in its functional modules such as Acquisition, Cataloguing, circulation, OPAC, Serial Control and Administration. The software is written with the support of programming language Perl and it supports LINUX operating system only. The server and database used as Apache and MySQL respectively and support MARC format for cataloguing process. Also it search and retrieve information using Z39.50 protocol support

**Year of first release** : 2011

**Software license** : NA

**Modules** : Acquisition, Cataloguing, circulation, OPAC, Serial Control and Administration.

**Latest version** : NA

**Community** : NA

**Present status** : Active

#### **5.3.18. Koha**

Koha, the world's first fully featured OSILS and the most popular OSILS used in Indian libraries. Koha was developed in New Zealand for the Horowhenua Library Trust from 1999-2000 by Katipo Communications and was installed there in 2000; however Koha was formally launched in the year 2005 (Koha, 2015). The software is adopted by public, academic and special libraries worldwide. LibLime is the key support company for the distribution, migration to and implementation of Koha. The company had launched the proprietary version of Koha called Enterprise Koha in 2009. The circulation module of the

software can handle issue, return and transfer and has a provision for online reservations and renewals by library patrons themselves. The software has a strong cataloguing module for recording the holdings of the library and the details can be viewed through the OPAC. Koha has a well-developed user records management system to record and retrieve the detailed information of each registered user. Koha can be used for any type of libraries ranging from school to public to academic libraries, museums, special libraries etc. Available literatures indicated that St. Joseph's College, Calicut, Kerala, is the first library to install Koha in India. Koha was supporting Linux, UNIX and Windows till its version 3. However the software is now more compatible with Linux only and use MySQL database for operational data and Zebra for indexing. Koha is written in Perl programming Language, so distribution of source code is automatic and Apache is the web server. Initial versions of the software were developed for public libraries, but later developed further to the needs of academic research and special libraries. Koha is web based software which stores its records in MARC21 format and use Z39.50 (Client & Server) protocol to exchange records with other systems Koha also follows the standards such as UNIMARC support, ISO 2709 (MARC communications format), Dublin CoreMODS. OAI-PMH, Z39.71 (serials display) etc. Koha is licensed under GNU General Public License and has modules such as circulation, cataloguing, acquisitions, serials, OPAC, reserves, patron management, branch relationships, and more.

**Features:** Koha offers advanced search interface with multiple boxes for entering search keywords and choosing Boolean operators. Koha facilitates the user to view their online public access catalogue in different languages based on the language chosen by the library. Overdue fines and other notifications can be sent to individual users through their email. Koha fully supports printing of barcode, label/ user card and the generation of various reports such as statistics in acquisition, cataloguing, circulation, serials management etc. Koha has all features for multi-tenancy applications also.

International conference on Koha 'KohaCon' was organized first time in 2006, May 2–3, at Paris, France and after a gap of two years from 2009 onwards an annual conference is being organized. Koha received various awards such as winner of the Not for Profit section of the 2000 Interactive New Zealand Awards and LIANZA / 3M Award for

Innovation in Libraries in 2000. Winner of the public organisation section of the Les Trophées du Livre in 2003, winner Use of IT in a Not-for-Profit Organisation Computerworld Excellence Awards in 2004 and Finalist OSS Project New Zealand Open Source Awards in 2014

<b>Year of first release</b>	: 2000
<b>Software license</b>	: GNU General Public License
<b>Modules</b>	: Acquisitions, Cataloguing, Circulation, OPAC, Patrons Management, Serials Management and Custom Reporting
<b>Latest version</b>	: 3.18.4
<b>Community</b>	: <a href="https://koha-community.org/">https://koha-community.org/</a>
<b>Present status</b>	: Active

**Libraries Using the Koha Software:** Synthite Industries Ltd.,Kerala; Indian Institute of Science Education and Research (IISER), Mohali; Dr. V. N. Bedekar Institute of Management Studies, Maharashtra; Mahatma Gandhi University (MGU), Kerala; IEC University , Himachal Pradesh; Lekshmipuram College of Arts and Science, Tamil Nadu; Ashoka Trust for Research in Ecology and the Environment (ATREE), Karnataka; Cochin University of Science and Technology (CUSAT), Kerala; Chinmaya Institute of Technology, Kerala; Jaswant S Kanwar Library of The International Crops Research Institute for the Semi-Arid-Tropics (ICRISAT), Hyderabad; School of Legal Studies, Cochin University of Science and Technology (CUSAT), Kerala; South Asia Institute of Advanced Christian Studies (SAIACS), Bangalore; Government First Grade College for Women, Mysore; Symbiosis International University, Pune; St. Stephen's College, Kerala; Pillai College of Arts, Commerce & Science, New Panvel ; Gurudas College, Kolkata; Nehru Arts and Science College, Kerala; Department of Ship Technology, Cochin Science and Technology (CUSAT), Kerala; Lokmanya Tilak College of Engineering, Mumbai; Mar Baselios Institute of Technology and Science (MBITS), Kerala; Mysore University Library, Mysore; O.P. Jindal Global University, Sonipat; Knowledge Services of Advinus Therapeutics Ltd., Bengaluru; Vaishnavi School of Architecture and Planning , Hyderabad; Vijnan Institute of Science and Technology (VISAT), Kerala; Asian School of Business (ASB), Kerala; Rajiv Gandhi University (RGU), Doimukh; Chitkara University, Himachal Pradesh; Indian cardamom Research

Institute (Spices Board), Kerala; Indian Institute of Technology Mandi (IIT Mandi), Himachal Pradesh, Sirohi District Institute Library of Azim Premji Foundation, Rajasthan; Institute for Financial Management and Research (IFMR), Andhra Pradesh; British Library, Hyderabad; Indian Institute of Space Science and Technology (IIST), Kerala; Indian Institute of Management (IIM Ahmedabad), Gujarat; Gogte Institute of Technology (GIT), Belagavi; Environmental Management and Policy Research Institute (EMPRI), Bengaluru; Christ Junior College, Bengaluru; Angadi Institute of Technology and Management (AITM), Belgaum; Federal Institute of Science and Technology (FISAT), Kerala; University of Calicut, Kerala; Department of Mathematics, University of Calicut, Kerala; CSIR-National Institute of Science, Technology and Development Studies (NISTADS), New Delhi; College of Engineering Vadakara (Formerly Co-operative Institute of Technology), Kerala; Sri Ramakrishna Mission Vidyalaya, College of Education, Tamil Nadu; Government Engineering College (GEC), Wayanad, Kerala; South Asian University Library, New Delhi ; Central University of Kerala, Kerala, Assam University, Silchar; Azim Premji Foundation, Uttarakhand; Government First Grade College, Ramdurg, Belgam; Kuvempu Institute of Kannada Studies, University of Mysore, Karnataka; Maharaja's College, University of Mysore, Karnataka; Indian Institute of Information Technology and Management-Kerala (IITM-Kerala), Kerala ; Alliance University, Karnataka; Malabar Cancer Centre, Kerala; Learning Resource Centre (LRC) of Tech Mahindra Limited, Pune; Medanta Hospital, Gurgaon; Indian Institute of Science Education and Research (IISER)Bhopal, Bhopal; The Indian Public School, Chennai; Learning Resource Centre (LRC), Mumbai; Aryanet Institute of Technology, Kerala; Central University of Bihar, (Gaya Campus), Gaya; Central University of Bihar (Patna Campus), Bihar; National Environmental Engineering Research Institute (CSIR-NEERI), Nagpur; Goa University, Goa; SNDT Women's University (Juhu Campus), Mumbai; Tumkur University, Tumkur, Karnataka; Model College, Mumbai; E-Books Digital Multimedia Library, Pune; National Institute for Interdisciplinary Science and Technology (NIIST), Kerala; Rajiv Gandhi University of Knowledge Technologies, Hyderabad; USM-KLE International Medical Programme, Karnataka; Indian Institute of Information Technology, Design & Manufacturing (IIITD&M), Chennai are institutions using this packages among the respondents.

### **5.3.19. *Kuali Open Library Environment (OLE)***

This library system is designed for managing and retrieving intellectual outputs and digital contents of academic and research libraries in collaboration with Andrew W. Mellon Foundation and the group universities of Kuali OLE founding partners in 2010. However the first public release of the software was in November 2011 with its version 0.3. The software is changed its license to The Affero General Public License (AGPL) from The Educational Community License Version 2.0, an initiative of open source. The software consists of acquisition module to manage selection, acquisitions, payment, invoicing, licensing and management of electronic resources, cataloguing, circulation, OPAC and system integration. The development of the software is still active and has added many features to compete with the next generation library system since its first version. The software is written on Java and Maven programming languages and runs under platforms like Windows, Mac OSX, LINUX with a support of database applications and web servers of Apache tomcat and MySQL. The software support MARC in cataloguing and support Z39.50 protocol for searching and retrieving information

<b>Year of first release</b>	: 2011
<b>Software license</b>	: The Educational Community License Version 2.0
<b>Modules</b>	: Acquisitions, Cataloguing, Circulation, OPAC, Serials Management and System Integration
<b>Latest version</b>	: Information is not available
<b>Community</b>	: Information is not available
<b>Present status</b>	: Active

**Libraries Using Kuali Open Library Environment (OLE) Software:** Information is not available

### **5.3.20. *Learning Access ILS***

Learning Access ILS is an OSILS developed by Seattle Learning Access Institute, a non profit organization with the sponsored support of Technology Resource Foundation (TRF) as Willem Scholten, the executive director of Learning Access Institute, was also associated with TRF. The software was previously known as OpenBook. The software has

all major modules such as Acquisition, OPAC, circulation, and cataloguing. The software supports both Windows and Linux operating systems and uses the Apache Web server. The software used PHP and Perl programming languages to create interface and functional modules. There is need for a formal authorization to access the software. The source code of the software is available for downloading and the software is best suitable for medium type libraries.

<b>Year of first release</b>	: Information is not available
<b>Software license</b>	: GPL licensed software
<b>Modules</b>	: Acquisition, OPAC, Circulation, and Cataloguing
<b>Latest version</b>	: Information is not available
<b>Community</b>	: Information is not available
<b>Present status</b>	: Information is not available

**Libraries Using the Learning Access ILS Software: NA**

#### **5.3.21. Librarian DB**

The software is a web-based library management system released under GNU General Public License version 2.0 (GPLv2) in 2007. The software is written in PHP programming language and use MySQL as webserver. A functional module available with the software is limited and has two major modules viz. catalogue and OPAC to record the bibliographic details and track them through the web based catalogue.

<b>Year of first release</b>	: 2007
<b>Software license</b>	: GNU General Public License version 2.0 (GPLv2)
<b>Modules</b>	: Catalogue and OPAC
<b>Latest version</b>	: db-0.3.3
<b>Community</b>	: Information is not available
<b>Present status</b>	: Active

**Libraries Using the Librarian DB Software: NA**

#### 5.3.22. Librarysoft

<b>Year of first release</b>	: Information is not available
<b>Software license</b>	: Information is not available
<b>Modules</b>	: Information is not available
<b>Latest version</b>	: Information is not available
<b>Community</b>	: Information is not available
<b>Present status</b>	: Information is not available

**Libraries Using the Librarysoft Software:** NA

#### 5.3.23. Library Manager

<b>Year of first release</b>	: Information is not available
<b>Software license</b>	: GPL License
<b>Modules</b>	: Catalogue, Circulation and OPAC
<b>Latest version</b>	: Information is not available
<b>Community</b>	: Information is not available
<b>Present status</b>	: Inactive

**Libraries Using the Library Manager Software:** NA

#### 5.3.24. Library Information Management System (LIMS)

<b>Year of first release</b>	: Information is not available
<b>Software license</b>	: Information is not available
<b>Modules</b>	: Information is not available
<b>Latest version</b>	: Information is not available
<b>Community</b>	: Information is not available
<b>Present status</b>	: Information is not available

**Libraries Using the LIMS Software:** Software is used in libraries in Pakistan and Middle East.

### 5.3.25. Mandarin

<b>Year of first release</b>	: Information is not available
<b>Software license</b>	: Information is not available
<b>Modules</b>	: Information is not available
<b>Latest version</b>	: Information is not available
<b>Community</b>	: Information is not available
<b>Present status</b>	: Information is not available

**Libraries Using the Mandarin Software:** NA

### 5.3.26. MiniSOPULI

As the expanded name of the software denotes ‘Mini Software for Public Libraries’ it is designed for public libraries of small collection. This is the basic version of the software called SOPULI (Software for PUBlic Libraries) which is licenced under General Public License and is available in English and Italian languages (MiniSOPULI, 2015). The software is written in Java, Python, PL/SQL and supports barcodes and Dewey Decimal Classification.

<b>Year of first release</b>	: Information is not available
<b>Software license</b>	: GNU General Public License version 2.0 (GPLv2)
<b>Modules</b>	: Information is not available
<b>Latest version</b>	: Information is not available
<b>Community</b>	: Information is not available
<b>Present status</b>	: Inactive

**Libraries Using the MiniSOPULI Software:** NA

### 5.3.27. NewGenLib

NewGenLib is another popular OSILS used in libraries as an automation tool and is the first Indian OSILS which is developed by VSPL (Verus Solutions Pvt. Ltd.) on the domain expertise provided by Kesavan Institute of Information and Knowledge Management, Hyderabad (KIIKM), India. First version (version 1.0) of the software was



released in March 2005 as a commercial product. After three years of its deployment, on 9th January 2008 source code of the NewGenLib software was made available to the public and registered under GNU General Public License as OSS. NewGenLib is the first Indian OSILS. NewGenLib is suitable for any kind of library and is used by various Indian libraries for about a decade. Development of NewGenLib Software is the outcome of the effort, experiences and feedback of Indian library professionals which make the software suitable for Indian libraries on par with the advantages of international library management systems. NewGenLib is useful not only as automation tool but also for creating institutional repositories since it comprises all the functions & features of both the software including web 2.0 applications. As an ILS, NewGenLib comprises functional modules such as acquisitions, technical processing, serials management, circulation, administration and OPAC. The programming language used by NewGenLib is Java and operating system best suitable is Linux. Apache web server and PostgreSQL database are used as supporting software to run the program. The standards followed by NewGenLib Software is MARC 21, Z39.50 Client, Unicode 3.0, SRU/W Server, ISO 2709 (MARC communications format), Dublin Core, MODS. OAI-PMH, Z39.71 (serials display). This metadata content management software solution uses RDBMS technology to manage databases and complies with International standards such as Dublin core, XML, MARC and UNICODE. NewGenLib is independent of operating systems and can run in Windows and Linux. It can also be run in the absence of access to internet with minimum functionalities. The modular architecture of the software consists of different tiers such as presentation layer, web server layer, business process layer, object relational model and database server. The version of the software is available in both English and Arabic and the RFID technology can be integrated with the available versions which is supported by unlimited number of RFID clients. NewGenLib has customizable, completely web based interface for its Online Public Access Catalogue (OPAC) and the library catalogue can be accessed on mobile phones and tablets using its Android application.

NewGenLib is featured with automated email and SMS despatch system which is integrated with various functions and support multi-locations, multi-libraries and multi-users. The software uses 'AutoEOD' (Automatic End of Day Process) application to send auto emails to users. 'AutoEOD' facilitates to automatically send reminders to its users on

renewal of resources, overdue notice, unclaimed reservations, general and database maintenance, auto block patrons, reminders to publisher/vendor on missing/delayed supply of books or journal issues etc. NewGenLib is incorporated with features like system generated mails; RSS feeds etc which keeps users informed about the recent additions in the database. The software also supports printing of barcodes and ID cards.

According to Sunil, NewGenLib has all the qualities to be considered as the key competitor in the ILS selection process along with the well-known commercial products in the market (Sunil, 2011). NewGenLib does not have an active user community like Koha for its development.

<b>Year of first release</b>	: 2008
<b>Software license</b>	: GNU General Public Licence
<b>Modules</b>	: Acquisitions, Technical Processing, Circulation, OPAC, MIS Reports, Administration, Serials Management, Daily Scheduler.
<b>Latest version</b>	: 3.1.2
<b>Community</b>	: NewGenLib Forum
<b>Present status</b>	: Active

**Libraries Using the NewGenLib Software:** Banaras Hindu University, Bangalore University, Goa University, Osmania University, Central Institute of Plastics Engineering & Technology, Chennai; Indira Gandhi Delhi Technical University for Women (IGDTUW), NewDelhi; IIT Jodhpur, Karnataka State Open University, Karnataka, University College of Arts, Tumkur University; Sree Chaitanya Institute of Technological Sciences, Hyderabad; SDMIMD, Mysore; Maulana Azad National Urdu University, Hyderabad; TKR College of Engineering & Technology, Hyderabad; VVIET, Mysore and Archaeological Survey of India (ASI) Hyderabad are the major libraries using NewGenLib as their ILS.

#### **5.3.28. Next-L Enju**

Next-L Enju, a web based library automation software developed in Japan by Project Next-L and is released under MIT License. The software has modules for basic house-keeping operations of a library such as cataloguing, circulation, patron management,

OPAC, serial control and reference management. It also has acquisition module with limited functionalities. Ruby on Rails, Ruby, Java SE 7 are the programming languages used in the software and the software runs on multiplatforms. The software supports CSV and XML format to import and export bibliographic records. Next-L Enju supports MARC format for cataloguing and is compatible with Z39.50 protocol

<b>Year of first release</b>	: 2011
<b>Software license</b>	: MIT License
<b>Modules</b>	: Cataloguing, Circulation, Serial Control, OPAC and Patron Management
<b>Latest version</b>	: 1.0.0.beta
<b>Community</b>	: Information is not available
<b>Present status</b>	: Active

**Libraries Using the Next-L Enju Software:** NA

#### **5.3.29. OPALS**

Open Source Automated Library System (OPALS) is web based OSILS developed and supported by Media Flex with their previous experience with Mandarin library automation (OPALS, 2015). OPALS runs on Linux platform and Perl is the programming language. The software is a leading ILS suitable for small libraries specifically for school libraries and is widely used in many countries. The download option for the software is not available, however copies of binaries and source code are available from Media Flex on request, but the library needs to pay an annual subscription fee to use the software and for support. The agency argues that there is no need to install software or purchase expensive computer hardware or software licenses to implement this powerful, turnkey Internet accessible system. The “total cost of ownership” of this standards-based, Web-based, feature rich software is demonstrably and undeniably sustainable. Apache is the web server used. The software supports the standards Unicode 3.0, Z39.50 client, MARC 21, ISO 2709 (MARC communications format). The software stores bibliographic records in MARC format and use Z-import, a built-in z39.50 client to access protocol compliant databases to add MARC records to the software. The software uses fixed fields, indicator bytes and sub-fields in order to access and display the data entered in it. The software is an open source

automation system for K-12 school libraries and adopted by many Church and synagogue libraries in United States.

<b>Year of first release</b>	: 2006
<b>Software license</b>	: GNU General Public License as published by the Free Software Foundation
<b>Modules</b>	: Acquisition, Circulation, Cataloguing, OPAC and Serials control
<b>Latest version</b>	: 122130 (last updated 28/11/2014)
<b>Community</b>	: Information is not available
<b>Present status</b>	: Active

**Libraries Using the OPALS Software:** NA

#### **5.3.30. OpenBiblio**

OpenBiblio software was developed by a group of people led by Dave Stevens and Micah Stetson in 2002. The software is more suitable for small and medium type libraries and is written in PHP language. The software was used by many libraries, however it is not updated and there is no development after 2008. The programming languages used by the software are PHP and LAMP (OpenBiblio, 2015). OpenBiblio is easy to install and it has common library software basic modules such as circulation, cataloguing, administrative modules and web based OPAC. Software generates and supports barcode and circulation respectively. Online renewals and reservation can also be done. Software supports MARC for data interchange. OpenBiblio software is available in English language only however its Spanish language version is named as Espabiblio. A person with knowledge in PHP and MySQL can easily customize the software.

<b>Year of first release</b>	: 2002
<b>Software license</b>	: GNU General Public License version 2.0 (GPLv2)).
<b>Modules</b>	: Acquisition, Circulation, Cataloguing, OPAC, Administration
<b>Latest version</b>	: 0.7.1
<b>Community</b>	: Information is not available

**Present status** : Active

**Libraries Using the OpenBiblio Software:** NA

#### **5.3.31. Open Marco Polo**

Open Marco Polo software is developed by the National University of Entre Ríos and released under the license LGPL (GNU Lesser General Public License) (Open Marco Polo, 2015). UNESCO's ISIS technology was used to develop the software and is therefore compatible with its other versions such as MicroISIS and WinISIS. The software has modules for cataloguing, circulation and OPAC and is available in Spanish language only. It works entirely in ISIS databases, enabling full compatibility with MicroISIS or WinISIS. It is scheduled Wxis / HTML and designed to operate in a web environment, whether Intranet or Internet. All screens are web system that allows new users to quickly familiarize with its "mode". The requirements for network operation are minimal, a PC server computer that manages all system operations, and no limits to number of users online. With an Internet link, programs can be accessed from anywhere on the network, a feature that can be very useful to consult the bibliographic databases from points outside the institution. (Project Open Marcopolo)

**Year of first release** : Information is not available

**Software license** : LGPL (GNU Lesser General Public License)

**Modules** : Cataloguing, Circulation, Administration and OPAC

**Latest version** : 1.6

**Community** : Information is not available

**Present status** : Inactive

**Libraries Using the Open Marco Polo Software:** NA

#### **5.3.32. OtomiGenX**

The software is released in English and Indonesian languages only and is licensed under GNU General Public License version 2.0 (GPLv2). The software is a kind of web application used for automating libraries. The software is developed based on PHP and MySQL and has modules for circulation, cataloguing and OPAC.

<b>Year of first release</b>	: Information is not available
<b>Software license</b>	: Information is not available
<b>Modules</b>	: Circulation, Cataloguing and OPAC
<b>Latest version</b>	: 3.0
<b>Community</b>	: Information is not available
<b>Present status</b>	: Inactive

**Libraries Using the OtomiGenX Software:** NA

### 5.3.33. **PMB (PhpMyBibli)**

PMB (formerly PhpMyBibli) was created in 2002 by a public library in France and the software was supported by an IT company for the first two years but now it is maintained by a French company named PMB service. PMB is a full featured OSILS with frequent updates in the versions with an addition of new features in it (PMB, 2015). The software is written using the programming language PHP and consists of basic library automation modules such as acquisition, cataloguing, circulation, OPAC and provides options for Selective Dissemination Service (SDI). PMB comprises two interfaces, nine choices of interface languages and detailed documentation for the librarian as well as the users with web based OPAC. The software supports the bibliographic standard UNIMARC and uses Z39.50 as information retrieval protocol and complies with OAI-PMH protocol. The software is available in French as well as English and support multi-language such as French, English, Spanish, Italian and Portuguese. The software has changed its licence from GNU General Public Licence and is now distributed under the licence, owned by a French equivalent called CECILL. The software also allows importing and full-text indexing of PDF electronic documents.

The adherence to interoperability standards makes PMBILS a good choice to record the bibliographical data and handling of electronic resources, which supports the data migration to any format or standard. (Sunil, 2011)

<b>Year of first release</b>	: 2002
<b>Software license</b>	: CECILL (France), earlier GNU General Public Licence

<b>Modules</b>	: Acquisition, Cataloguing, Circulation, Administration, Serials Management, SDI and Reports
<b>Latest version</b>	: 4.1.2
<b>Community</b>	: Information is not available
<b>Present status</b>	: Active

**Libraries Using the PMB Software:** NA

#### **5.3.34. PhpMyLibrary**

PhpMyLibrary is a web based ILS developed under PHP and MySQL databases. The software consists of Catalogue, Circulation and web enabled OPAC modules to perform library functions. The software has import export feature and supports MARC. Supports import from ISIS database with an ISIS2MARC program and follows USMARC standard for adding materials. The software is compatible with the content management system enabling the customization of its interface. Reservation and renewals can be done online and it has interface for circulation and management. PhpMyLibrary is mainly used by small libraries and is available in English, Indonesian, German and Spanish languages. There has been no further development in the software in the last decade.

<b>Year of first release</b>	: Information is not available
<b>Software license</b>	: GNU General Public License (GPL)
<b>Modules</b>	: Acquisition, Cataloguing, Circulation and OPAC
<b>Latest version</b>	: Information is not available
<b>Community</b>	: Information is not available
<b>Present status</b>	: Inactive

**Libraries Using the PhpMyLibrary Software:** NA

#### **5.3.35. PYTHEAS (OSDLS)**

PYTHEAS is an acronym used to indicate the name of the software 'Powerful Yet Tactfully Helpful Electronic Arranger of Sources'. This software is a multi-tier ILS developed by a single person, a Librarian at the University of Arizona in 1999 continued by the System Librarian of University of Windsor. The source code of the software is available

for free downloading and the architecture of the server is based on XML. Software supports both MARC and RDF standards for bibliographic, holdings and authority records. JAVA and XML are the programming languages used for software development and it consists of only two modules such as circulation and OPAC modules. Though the software is available to download in the public domain it has only limited documentation.

<b>Year of first release</b>	: 1999
<b>Software license</b>	: Information is not available
<b>Modules</b>	: Circulation and OPAC
<b>Latest version</b>	: Information is not available
<b>Community</b>	: Information is not available
<b>Present status</b>	: Information is not available

**Libraries Using the PYTHEAS Software: NA**

#### **5.3.36. Senayan Library Management System (SLiMS)**

Senayan Library Management System (SLiMS) is a free and open source web based Library Management System with modules such as circulation, OPAC, membership management, serial control, and bibliography database (SLiMS, 2015). The software is licensed under GPL v3. Because it is full-featured and still actively developed, SLiMS is suitable for libraries that have varied collections, several staff members and a networked environment, whether local network (intranet) or the Internet (Senayan, 2014). The software uses PHP and AJAX programming languages and runs on platforms such as Windows, LINUX and UNIX operating systems. MySQL is the database and Apache is the server used. Software is compatible with MARC standard and support Z39.50 protocol for searching and retrieving information from a database. SLiMS was awarded Indonesia ICT Award in the year 2009. The software supports the use of RSS (Really Simple Syndication) XML format for OPAC, OPAC simple and advanced search features and supports thumbnail document image.

<b>Year of first release</b>	: 2008
<b>Software license</b>	: General Public License v3



<b>Modules</b>	: Cataloguing, Circulation, Serials Management, Stock Verification, Report Generation, OPAC and Membership
<b>Latest version</b>	: Senayan3-stable10
<b>Community</b>	: Information is not available
<b>Present status</b>	: Active

**Libraries Using the SLiMS Software: NA**

#### 5.3.37. WEBLIS

WEBLIS is a web based ILS developed using CDS/ISIS technology by the Institute for Computer and Information Engineering (ICIE) of Poland supported by UNESCO and distributed with WWW-ISIS (WEBLIS, 2015). The software is available in English and consists of basic library modules such as cataloguing, circulation and OPAC and statistical module. The WebOPAC consists of search options for basic search, advanced search and thesaurus based search. Cataloguing module of the software is simple and is very easy to add an item to a catalogue record. It is free software but the source code is not available to the public. The software was last updated in the year 2007 however WEBLIS is still available for download.

<b>Year of first release</b>	: 2004
<b>Software license</b>	: Information is not available
<b>Modules</b>	: Cataloguing, Circulation, OPAC, Statistical Reports
<b>Latest version</b>	: Information is not available
<b>Community</b>	: Information is not available
<b>Present status</b>	: Information is not available

**Libraries Using the WEBLIS Software: NA**

#### 5.4. Characteristics of OSILS

The OSILS are freely available for downloading and installing and are easy to learn and use. It is user-friendly and does not require much programming background. Development in comparison to commercial product is rapid and more responsive in the case of OSS. OSILS is highly adopted by libraries in India due to its peer review system which increases the reliability and quality of the software. Customization of the software to

meet the individual requirement of the library and the freedom to run, modify, improve and distribute freely attract the libraries to adopt OSILS.

**Z39.50:** Z39.50 is an information retrieval standard that allows searching and retrieving of information from a remote computer database. Most of the OSILS supports Z39.50 standard. During the adoption or migration from software this standard helps to directly import completed catalogue records from one ILS to another. In OSILS, Machine Readable Catalogue (MARC), Universal Machine Readable Catalogue (UNIMARC) and Common Communication Format (CCF) and or their local variations are the common standards used for database design and creation of bibliographic records. However MARC is the more popular standard format used in most of the OSILS used in Indian libraries which helps to exchange the bibliographic data from one system to another if a library wanted to switch over from one to another.

**MARC21:** MARC or Machine Readable Cataloguing is a bibliographic standard developed by the Library of Congress for exchanging computer data. MARC indicates Machine Readable Cataloguing and the 21 indicates 21<sup>st</sup> Century. MARC21 format in an OSILS allows selection of a particular field to generate necessary report to an individual library. This option is very useful when software is associated with other branches of the same library.

The most widely used free software licence is GNU General Public Licence (GNU GPL) and most of the OSILS adopted in Indian libraries come under this licence.

Most of the OSILS are compatible with the commonly used operating systems such as Windows, Linux and Mac OS.

## **5.5. Need for Scaling Up Technologies**

It is found from the outline of the proprietary and OSILS that many of the software packages were designed long before the advent of the World Wide Web; hence they lack many features of a typical ILS. Further many of the software packages do not support next generation technologies due to the lack of further developments. Necessary considerations need to be made when choosing an OSILS for the library. It is found from the literature

review and the survey for the study that Koha, NewGenLib, ABCD, Evergreen are the only OSILS used in Indian libraries. Others have one or two installations in institutions where the system is not alive. Though e-Granthalaya is free software for the purpose of analysis the software is considered under OSILS category. Review of related literature also showed various studies on this software and its different aspects by Indian librarians. An increasing number of libraries are realizing the advantages and significance of adopting OSILS. Among the total responses received under OSILS, Koha was the software found to be used by majority of the libraries in India. Hence, Koha was selected for detailed analysis. Number of libraries using ABCD software was found insignificant. The software is relatively new and has not been widely adopted in Indian libraries. There is always the danger of the new integrated package being rejected by the libraries as being inefficient or as not being sufficient to meet the library's demands (Foote, 2010).

Still there are many public libraries in rural areas of India; they are either not using any automation software or just started preparing for automating their libraries. Even in urban areas, some libraries still rely on their legacy out dated system without making any updates. Therefore planning for library automation among all Indian libraries is necessary regardless of their area of service.

## Chapter 6

# ANALYSIS, DISCUSSION AND FINDINGS

### 6.1. Nature of the Survey

This chapter analyses and interprets the data collected through the online questionnaire and personal interviews. The survey and the interview focused on collecting data on various aspects pertaining to the perceptions of individual libraries towards the adoption of Open Source Integrated Library System (OSILS). Questionnaires were prepared keeping in view different aspects of both open source and commercial library management software. The survey was done over a period of eight months starting from 2014 March to 2014 December and more than 5000 library professionals were requested to attempt the online survey through personal and official email IDs, forums, groups etc.,. Frequent reminders were sent to the professionals who had not responded to the questionnaire in the first attempt. Much effort and ample time had been given to the respondents to get a higher response rate. As many as 601 professionals using any of the ILS across the country responded to the online survey in all respects during the ten months period. Results of the online questionnaire were categorized into two to identify the perceptions on both OSILS and commercial ILS users.

### 6.2. Selection of Questionnaire Responses

Different criteria were followed to scrutinize the total responses received for the online questionnaire to avoid anomalies in the completeness of the final analysis. Out of 601 responses, only 520 responses were taken for the final analysis and the selection of responses were done as per the following predefined criteria.

#### 6.2.1. Multiple Response from Single Library

The study was intended to consider the libraries effectively using any of the ILS regardless of the kind of libraries such as academic/research/corporate/public etc. However,

only one response was chosen if the questionnaire was attempted by more than one person from the same institute. The choice of selection was made by considering the designation of the respondents. For example, there were two responses received from Central Library of a National Institute of Science, Thiruvananthapuram, Kerala viz. the Assistant Librarian and the Library Information Assistant Trainee. The response of the Library Information Assistant Trainee was dropped from the analysis as the Assistant Librarian is at a higher level with more information under his/her control.

### **6.2.2. Multiple responses from the same person**

There were cases where the same respondent attempted the questionnaire more than once. A single response was chosen from among the multiple responses considering the number of questions answered, the genuineness and accuracy of the information provided on various aspects.

### **6.2.3. Replies from Respondents Outside the Country**

As the scope of the research study was limited to Indian libraries, those who attempted the questionnaire from abroad and working for libraries outside India which were not under the purview of this analysis were not selected for the final analysis.

### **6.2.4. Incomplete Responses**

There were many mandatory and non-mandatory questions in the questionnaire. If the questionnaire is not completely filled up in respect of mandatory items, it was omitted in the first screening itself.

As the first part of the questionnaire was general in nature and sought responses from both open source and commercial software library users, the analysis was done for all the responses received. The first part of the questionnaire consisted of twenty one common questions, which is given in Appendix I. The second part of the questionnaire was designed for respondents who use any one of OSILS for their libraries and included 16 questions to receive the perceptions of OSILS on its use and is provided in Appendix II. Third part of the questionnaire was designed to collect feedback from the library/IT/Computer

professionals who use any ILS package other than 'Open Source' i.e. Commercial/Proprietary/In-house/Software developed by others which is given in Appendix III.

In addition to these three parts of the questionnaire separate personal interviews have also been conducted to gather the personal views of the experts in the OSILS domain and the format of the questionnaire is given in Appendix-IV.

### **6.3. Data Analysis and Discussion**

The study surveyed all types of libraries currently using any type of ILS for their libraries in India. There were 601 individual responses received from different parts of the country and among them 520 responses were selected after eliminating duplicate and partially filled responses for final analysis. The responses were further categorized into two as those libraries using OSILS and Others. Out of these 520 responses considered for final analysis, 387 individual libraries were selected for the analysis from the category of those libraries using any of the 'commercial' or 'in-house' or 'developed by others' category software and 133 responses were taken under the category of libraries using any of the open source or free software as ILS for the library automation.

Response to each questions from all three parts of the questionnaire and all the comments of the respondents on their views on both open source and commercial software were analyzed. Analysis of the survey result is broadly divided into two major categories, i.e the responses received from libraries using OSILS and other than OSILS, such as commercial, proprietary, in-house or developed by others etc. If more than one person responded for the survey from the same institute or organization, then the analysis was done for the person who has higher qualification and more experience. However the personal views, attitude and experiences as maintained at the beginning of this chapter are fully considered in the analysis in case of multiple institutional entries.

The responses of the survey was stored in a Microsoft Excel spreadsheet associated with Google docs with variables in each rows such as age group, type of library, collection size, staff pattern etc. Full name of the library and postal address were found and filled by

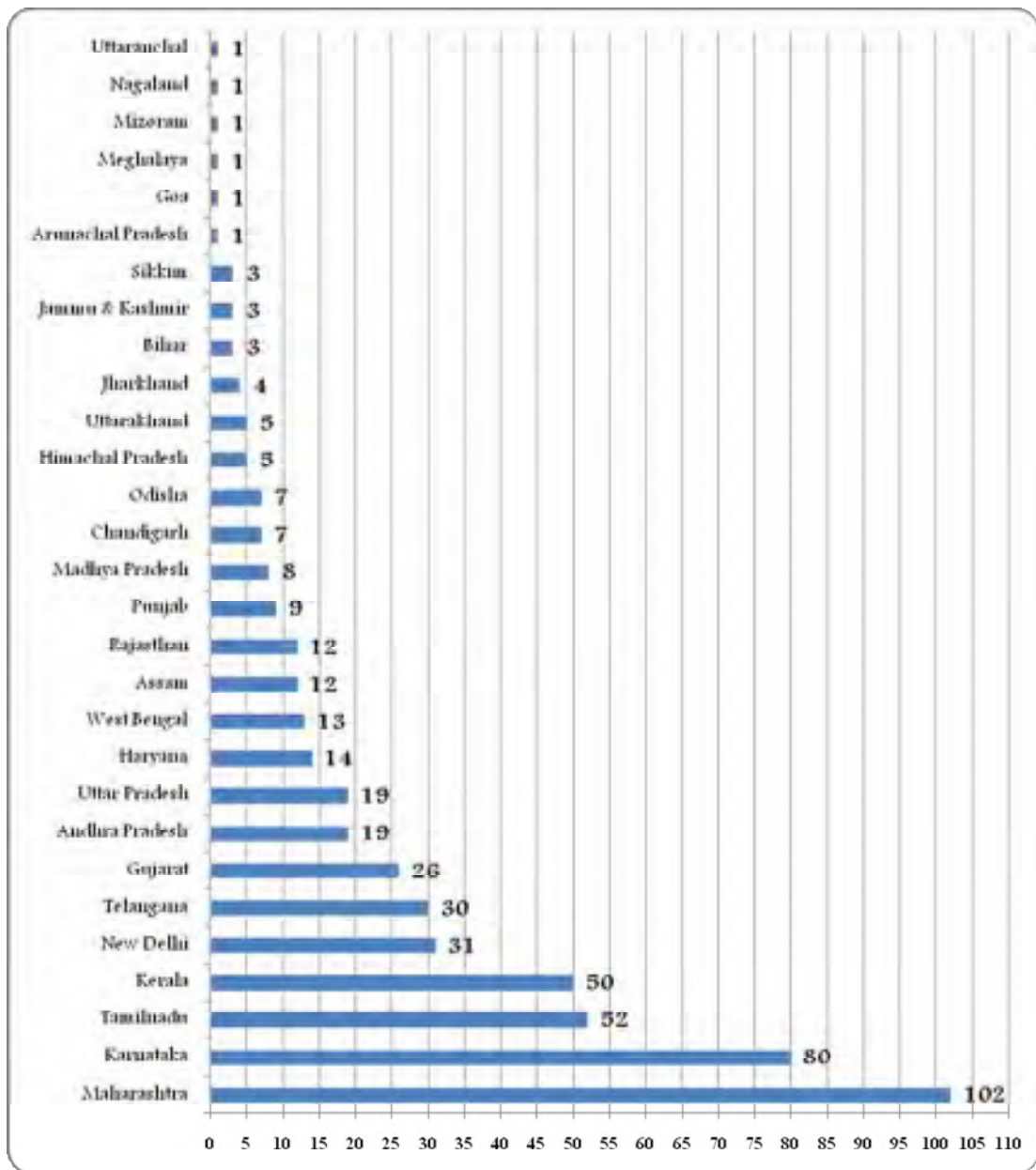
searching the particular institute/organization if not completed by the respondents. Tables, figures, charts etc. were created to represent the responses graphically and diagrammatically.

#### **6.4. Primary Data Analysis**

The first part of the online questionnaire requested the demographic details of the respondents and gathered information about gender, age, type of library, collection size, state etc of the individual respondents. The following sections of the chapter provide an overview of the demographic profile of the respondents.

##### **6.4.1.State wise Respondents**

The population of the research study was spread across the country and cover libraries using any of the ILS. Figure.6.1 shows the state wise distribution of the population of respondents. 601 library professionals across the country responded to the questionnaire during the specific period. The results of the questionnaire was thoroughly checked for duplication and inconsistencies and 520 responses found to be unique and valid were selected for the final analysis, which were first analysed according to their geographic distribution. The study revealed that out of 520 installations in India the major groups of libraries belong to Maharashtra (102), Karnataka (80), Tamil Nadu (52) and Kerala (50). The other libraries from each State/Union territory who responded were New Delhi, Telangana, Gujarat, Andhra Pradesh, Uttar Pradesh, Haryana, West Bengal, Assam, Rajasthan, Punjab, Madhya Pradesh, Chandigarh, Odisha, Himachal Pradesh, Uttarakhand, Jharkhand, Bihar, Jammu & Kashmir, and Sikkim. There was response from just a single library from the States of Uttaranchal, Nagaland, Mizoram, Meghalaya, Goa and Arunachal Pradesh. Statewise responses are graphically represented in Figure 6.1.



**Figure 6.1: State wise Respondents**

The geographically distributed responses indicated that the highest rate of response was received from the state of Maharashtra followed by Karnataka, Tamil Nadu, Kerala, Delhi, Telangana and Gujarat. There are significant number of responses received from other states such as Andhra Pradesh, Uttar Pradesh, Haryana, West Bengal, Assam, Rajasthan, Punjab, Madhya Pradesh, Chandigarh and Odisha where-as the rate of responses were comparatively low from States such as Himachal Pradesh, Uttarakhand, Jharkhand, Bihar, Jammu & Kashmir, Sikkim and was very poor from states like Arunachal Pradesh,



Goa, Meghalaya, Mizoram, Nagaland and Uttaranchal. The states which are not included in the above mentioned categories did not respond at all to the questionnaire. It is assumed from the study that the promotional activities and adoption of ILS for library automation has not been fully accomplished in these States.

#### **6.4.2. Gender Distribution of the Survey**

Specific columns to indicate the gender of the respondents were given in the questionnaire. The distribution of responses based on their gender classification were 434 (83%) male and 86 (17%) were female respondents. Data related to gender distribution of the respondents is presented in the Table 6.1.

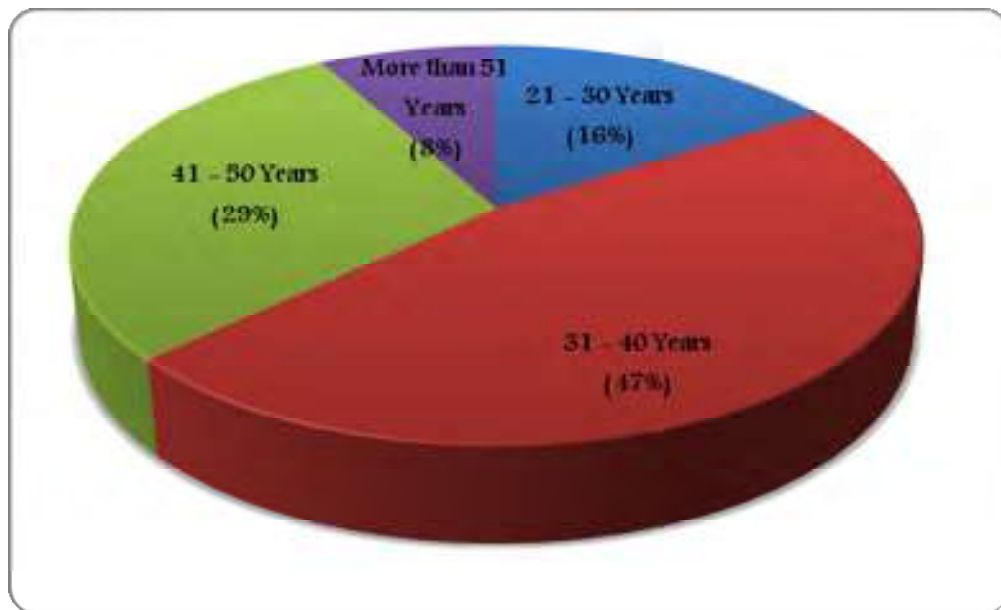
**Table 6.1: Gender Distribution of the Respondents**

Sl No.	Gender	Frequency	Percentage (%)
01	Male	434	83
02	Female	86	17
Total		520	100

Gender is a significant variable in analyzing the result hence the variable gender was observed for its analysis. The frequency table clearly shows that there is wide range of imbalance between male respondents and female respondents in their numbers.

#### **6.4.3. Respondents Age Group**

The respondents of the survey were male and female of different academic qualifications and were graphically represented by their age group. Different segments of respondents were formed with regard to age of the respondents. Out of 520 respondents, 47% professionals were in the age group of 31-40 years where as the ratio of 21-30 years and 41-50 years were 16% and 29% respectively. The senior respondents beyond 51 years stood last at 8%. Data related to age group of the respondents are graphically presented in Figure 6.2.

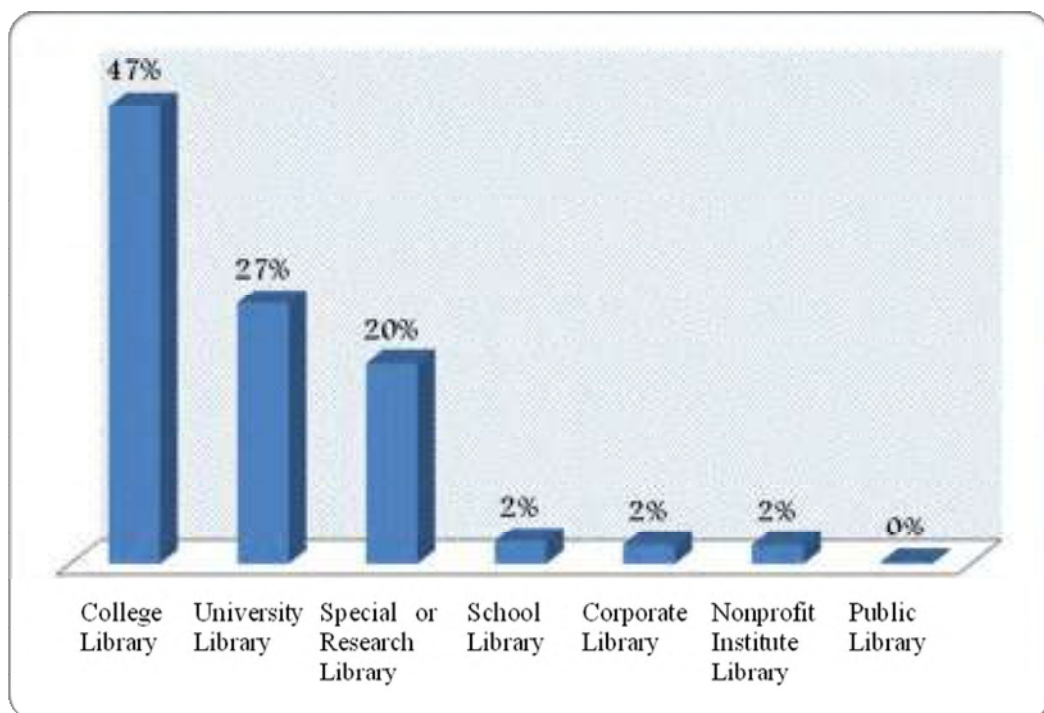


**Figure 6.2: Respondents Age Group**

Age of the respondents is also one of the significant variables in understanding the views on particular issue. Age group indicates the level of maturity in their profession. However, the study focused more on information and communication and networking technologies, which are new technological era, the respondents in the age group of 31-40 are very keen in adopting technologies compared to the age group of 41-50 and 21-30 years.

#### **6.4.4. Type of Library**

Respondents were found to be from different types of libraries such as Universities, Colleges, Schools, Public, Corporate, Non-profit, Special or research libraries. It is obvious from the analysis that a majority of the respondents were from college libraries 47% (243) followed by 27% (138) from university libraries, and 20% (106) from special/research libraries, 2% (12) from school libraries and 2% (10 each) were from corporate libraries and non-profit institute libraries. A single response was received from a public library. Data related to the library type is presented in Figure 6.3

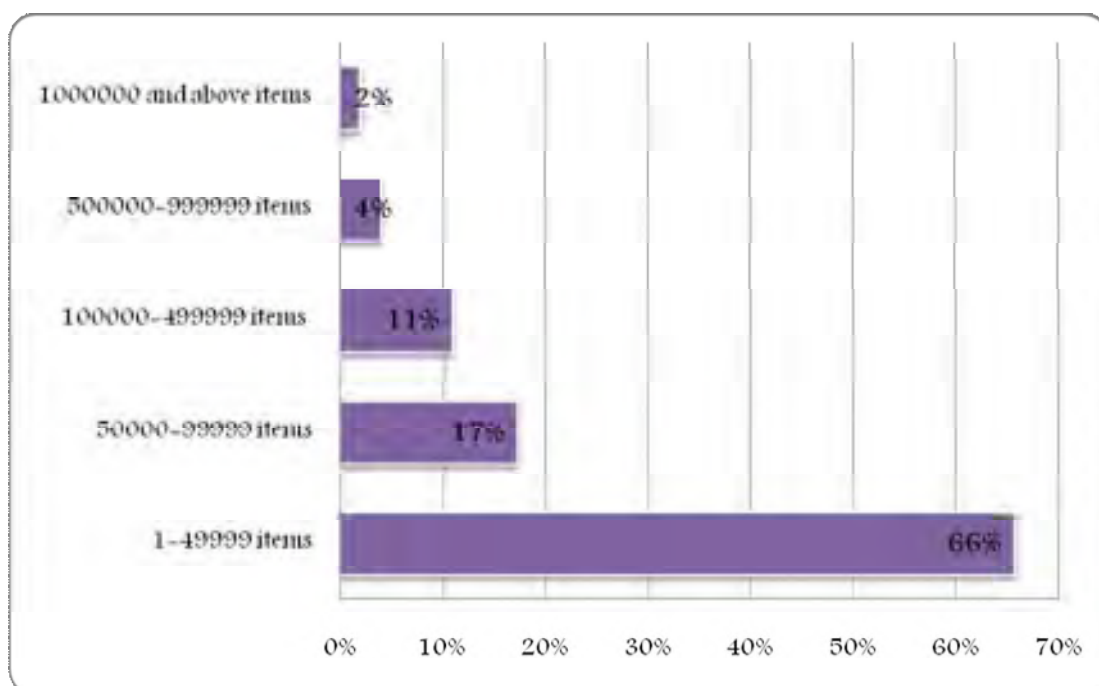


**Figure 6.3: Type of Responded Libraries**

The data collected was found to be very significant to understand the library type of the respondents, which revealed the kinds of libraries more prone to technological adaptation. The study found that ILS are being adopted by all types of libraries in India; however the rate of adoption is minimum in small libraries, school, public, non- profit institute and corporate libraries.

#### **6.4.5. Collection Size**

Respondents were requested to furnish information about the size of their library collection. The libraries which responded fall under five groups according to the size of collection. These are 1-49999 (66%), 50000-99999 (17%), 100000-499999 (11%), 500000-999999 (4%) and 1000000 (2%) and above. The responses reveal that libraries ranging from low to high collections have adopted some kind of Integrated Library Automation System to automate their libraries for their house keeping operations. Figure 6.4 details the description of the data received from the respondents with regard to size of collection.



**Figure 6.4: Collection Size**

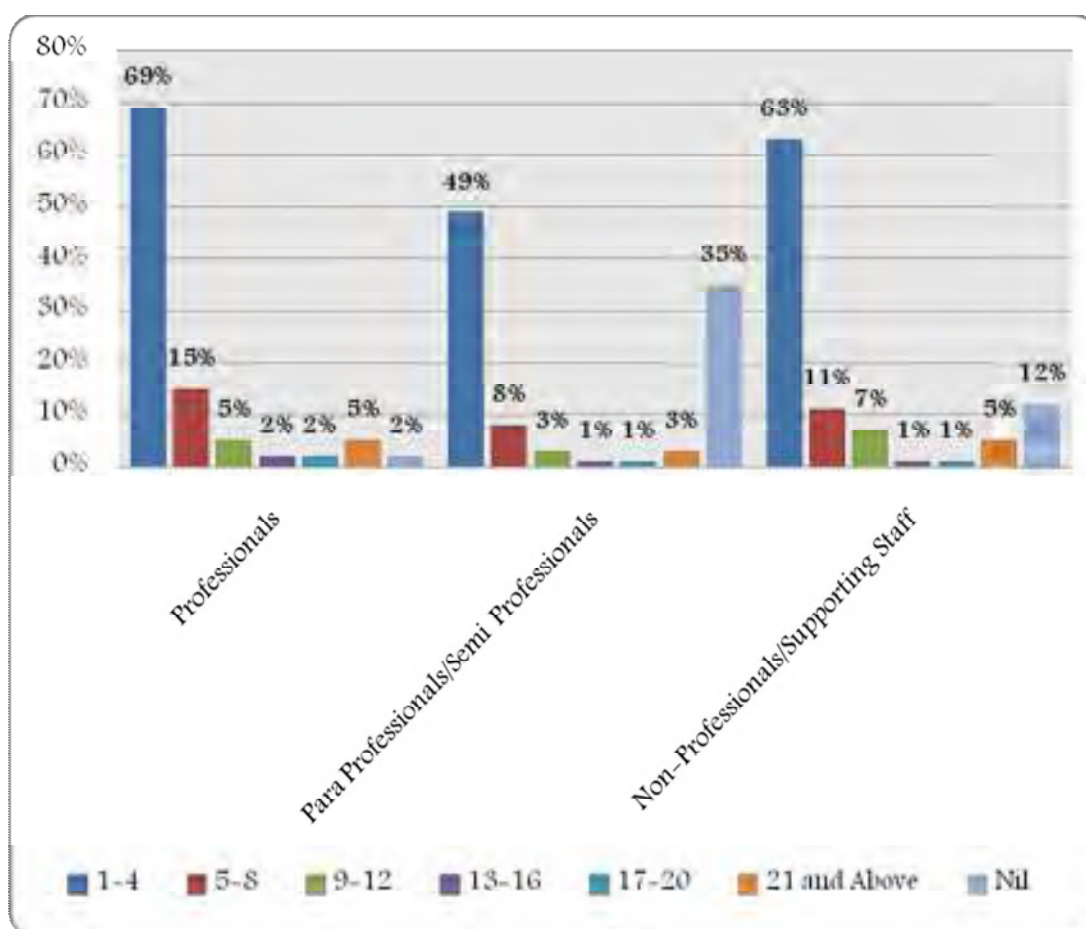
The data collected indicates that collection size does not have any implication in adopting ILS for their functions and services.

#### **6.4.6. Staff Pattern**

Human resource with specialization is one of the requirements for the adoption of ILS in libraries. It is true that there should be a dedicated and enthusiastic team of library staff with adequate literacy in computer applications for a successful library automation process. A regular and constructive communication among the staff is also a must if the library intends to install and maintain the software on their own. Adequate planning as well as support from technical staff is also very much essential to complete the automation within a stipulated time.

While examining the staff pattern of the responding libraries, the available staff were segregated according to their responsibility and position held such as Professionals, Semi Professionals and Supporting Staff. It was observed from the analysis that 69% of the libraries which responded were working only with 1-4 professionally qualified staff where as 15% libraries consisted of 5-8 professionals and few libraries have 5% professionals, and

9-12 range and 21 and above in numbers. Few libraries (2%) were managing their libraries without any professionally qualified staff. The percentage of libraries that fall into the 1-4, 5-8, 9-12, 13-16, 17-20, 21 and above and Nil were 49%, 8%, 1%, 1%, 3% and 35% respectively. 12% of the responded libraries lack Non-Professionals in their libraries to work as supporting staff however 63% of them were having 1-4 staff strength. Comparatively the proportion of semi professionals was found to be lesser than Professionals and Non-Professionals. The detailed staff pattern represented by the respondents is depicted in Figure 6.5.

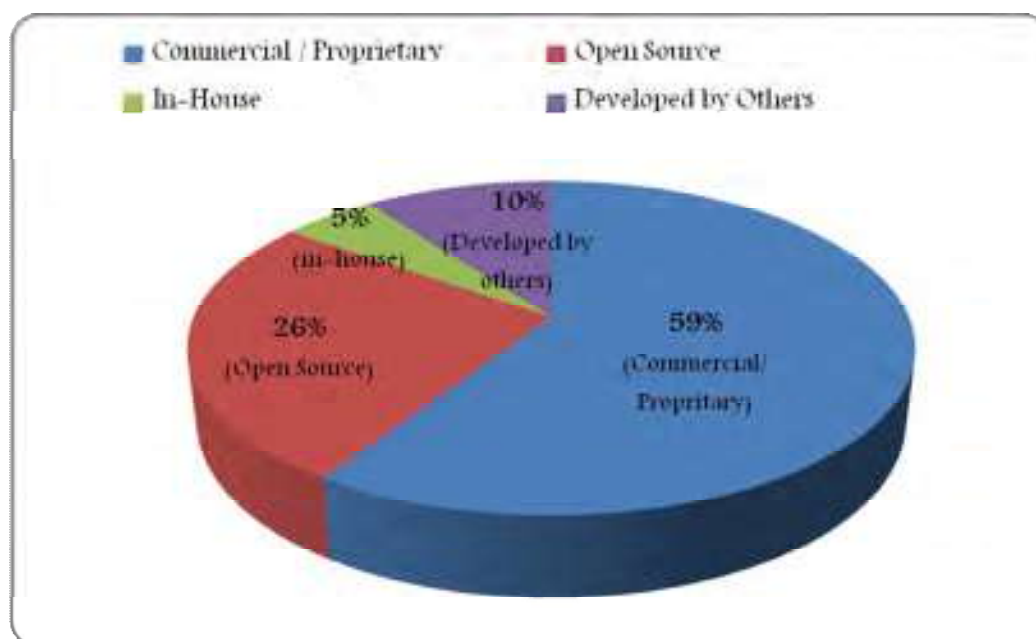


**Figure 6.5: Staff Pattern**

Lack of sufficient number of library staff and insufficient expertise to handle the installation and maintenance or customization of the software is the main weakness affecting the libraries. Lack of minimum number of professionals with expertise in computer applications to handle the activities of libraries is also a major concern.

#### 6.4.7. Type of Software Being Used

A number of domestic and foreign ILSs of different categories such as commercial/proprietary, free/open, in-house/developed by others are being used in Indian libraries. Selection of suitable automation software according to the local requirement of the library is a crucial task, especially when the availability of open and commercial software is large. When information was sought on the type of software being used by the respondents, 308 (59%) libraries responded that they were using commercial/proprietary software and 133 (26%) were using OSS for library automation. Some libraries had custom or tailor made software. In the sample population there were 51(10%) responses from those who are using software developed by others and 28 (5%) and who were using In-house software. Figure 6.6 diagrammatically represents the type of software used by the respondents.

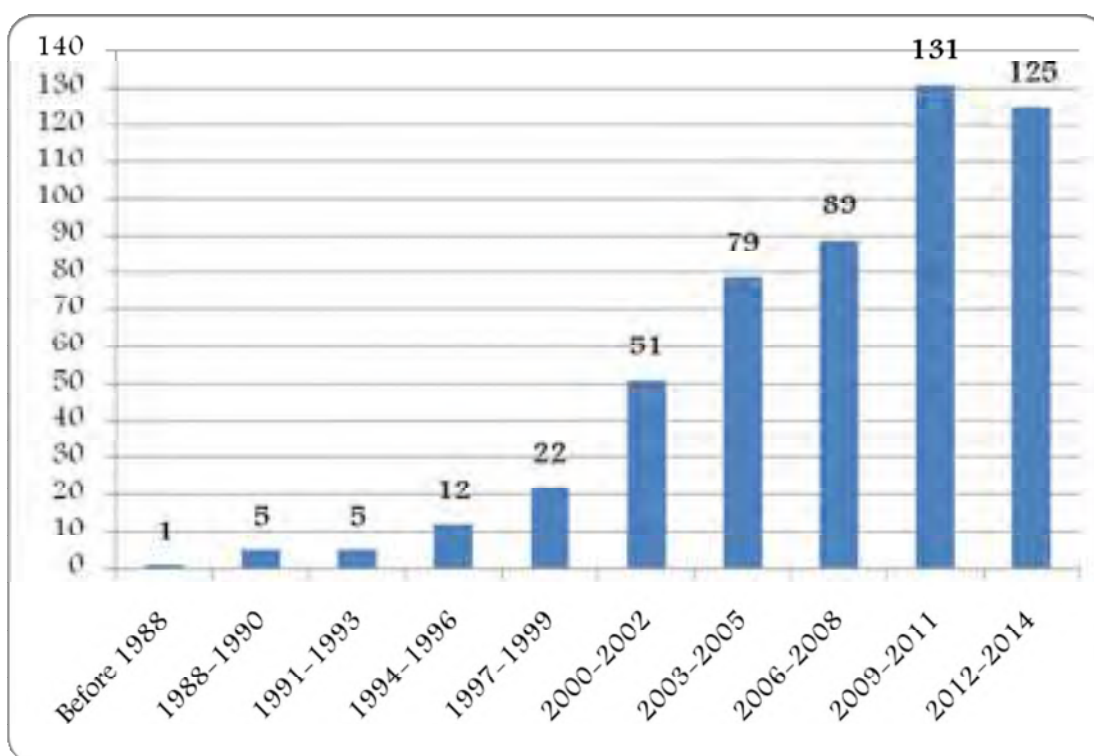


**Figure 6.6: Type of Software Being Used**

The data collected revealed that the response rate is comparatively less for libraries using OSS for library automation against commercial, proprietary, in-house and self-developed software. The analysis of collected data indicates that the rate of adoption of open source ILS is limited in Indian libraries and is less than half of the total libraries using commercial/proprietary packages.

#### 6.4.8. Yearwise Adoption of the Software

Survey checked the year of adoption of the software by individual libraries to know the growth rate of adoption. The analysis reflects that the rate of adoption of ILS in Indian libraries is extensive and drastic every three years. The trend of ILS adoption has been highly progressive in the present but was insignificant before 1988 and the percentage gradually increased as 1%, 2%, 4%, 10%, 15%, 17%, 25% and 24% during the year range of 1988-1993, 1994-1996, 1997-1999, 2000-2002, 2003-2005, 2006-2008, 2009-2011 and 2012-2014 respectively. The analysis of the data is graphically represented in Figure 6.7.

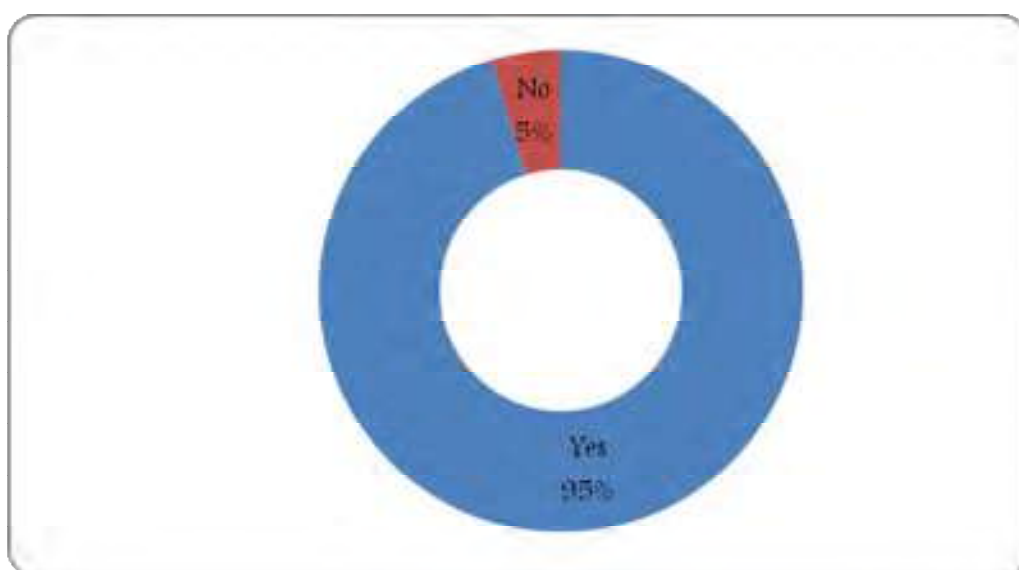


**Figure 6.7: Yearwise Adoption of the Software**

Analysis shows that from the year 2000 onwards there has been a drastic increase in the adoption of ILSs in Indian libraries. The trend of adoption has been highly progressive which increased by 25% in 2009-2011 and there is a drastic uplift each year in terms of individual adoption. There are number of ILS through which libraries can make choice to manage their library by retaining their individuality.

#### 6.4.9. Awareness on OSILS

The questionnaire in its design included questions to comprehend the awareness and observation of OSILS by library professionals in India. Regardless of type of library and the software being used in their libraries, the respondents were asked to indicate their awareness of OSILS. In response to the question on their awareness of OSILS, 95% of the total respondents indicated that they were familiar with the benefits of OSILS in automating libraries. Diagrammatic representation of the data analysis is depicted in Figure 6.8.



**Figure 6.8: Respondents Awareness on OSILS**

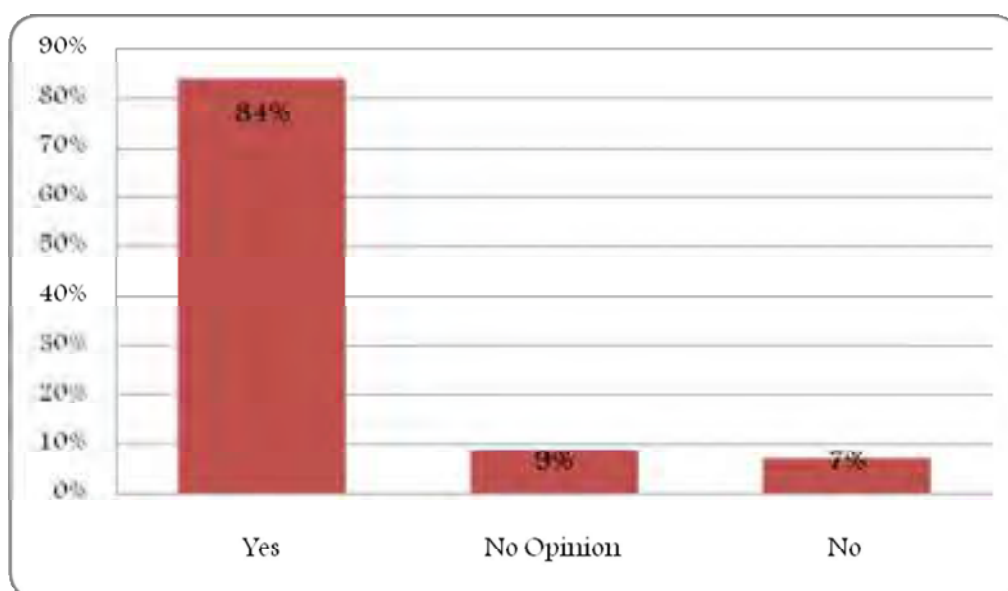
The analysis of the data indicated that awareness and knowledge on open source technology among library professionals is very high. As most of the respondents have heard of open source ILS, we can assume that the reason for libraries not choosing OSILS is not because they were unaware of its existence or they prefer proprietary software for good reasons.

#### 6.4.10. Support on OSILS

Respondents were asked to comment on whether they support adoption of OSILS in Indian libraries regardless of whichever software is installed in their libraries. It was interesting to note that greater majority (84%) of the total respondents' support the adoption of OSILS in Indian libraries and it is a clear indication of the future popularity of the



software. 9% of the respondents indicated no opinion on support and 7% gave negative remarks on support. The graphical representation of the analysis of data collected from the respondents is depicted in Figure 6.9.

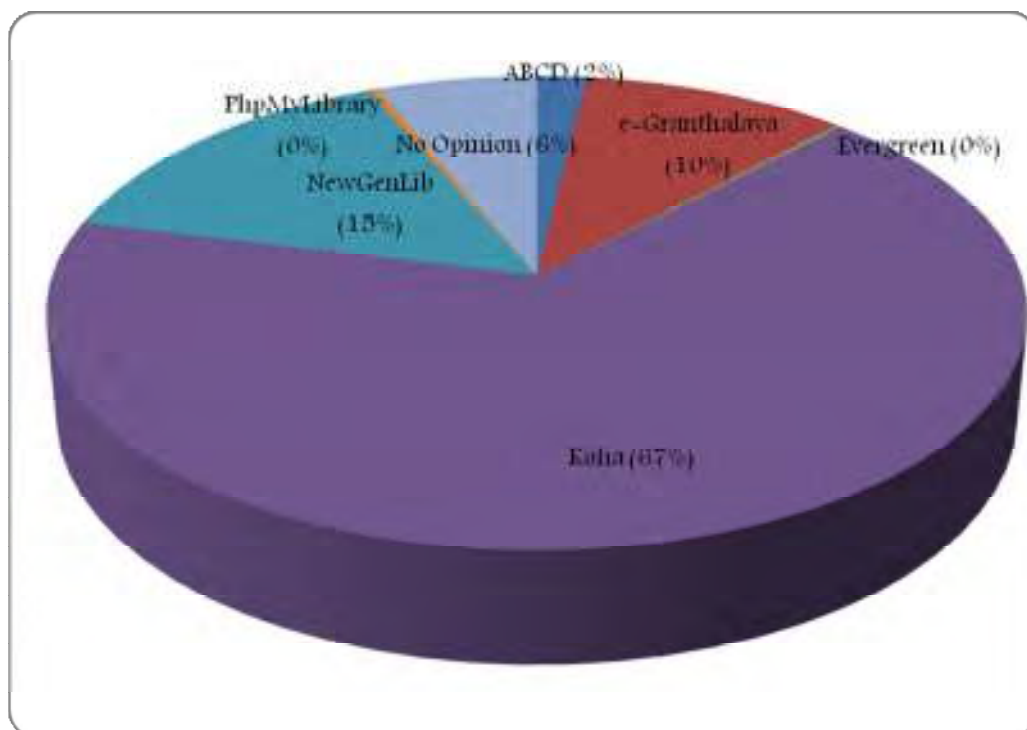


**Figure 6.9: Respondents Support on OSILS**

There is no lacuna in understanding the benefits of using OSILS in Indian libraries and a higher majority of the respondents have supported the adoption of OSILS in their libraries. The existing presence of OSILS in Indian libraries is increasing as the libraries are choosing OSILS as an alternative to costly proprietary software. Libraries are often feeling the stress of limited budget to purchase and maintain commercial software considering adaptability as well as flexibility of OSILS. Supporting and adopting OSILS reduces the stress on financial pressure of the library and enhances the confidence in customizing the software. Even with less technical knowledge staff and minimum available infrastructure libraries will also benefit with adoption of OSILS in a cost effective manner. In the last two decades many libraries in India have adopted OSILS which is evidence of its growing support.

#### 6.4.11. Best Suitable OSILS

Even though plenty of automation software are available in the software industry as open source as well as closed source ILS, just a few are extensively used in Indian libraries. A lot of software meant for library automation are no longer being used by Indian libraries due to inadequate supports, zero updates and maintenance. The features and functions of an ILS needs to be analysed before its adoption to determine whether the software meets the requirements of the specific library. Study attempted to find the best suitable OSILS in Indian libraries. Respondents were asked to indicate the best suitable OSILS in Indian library situation. According to respondents software Koha (67%) is found to be the most suitable software for Indian libraries. Moreover it is found from the survey that many of the Koha installations have commenced operation since 2008. NewGenLib software was selected to be the second best suitable software (15%) for Indian libraries and e-Granthalaya (10%) was found to be the next. A significant number of respondents (6%) were not able to provide the name of a single software which would be best suited for Indian scenario. The diagrammatic representation of the analysis is made in Figure 6.10



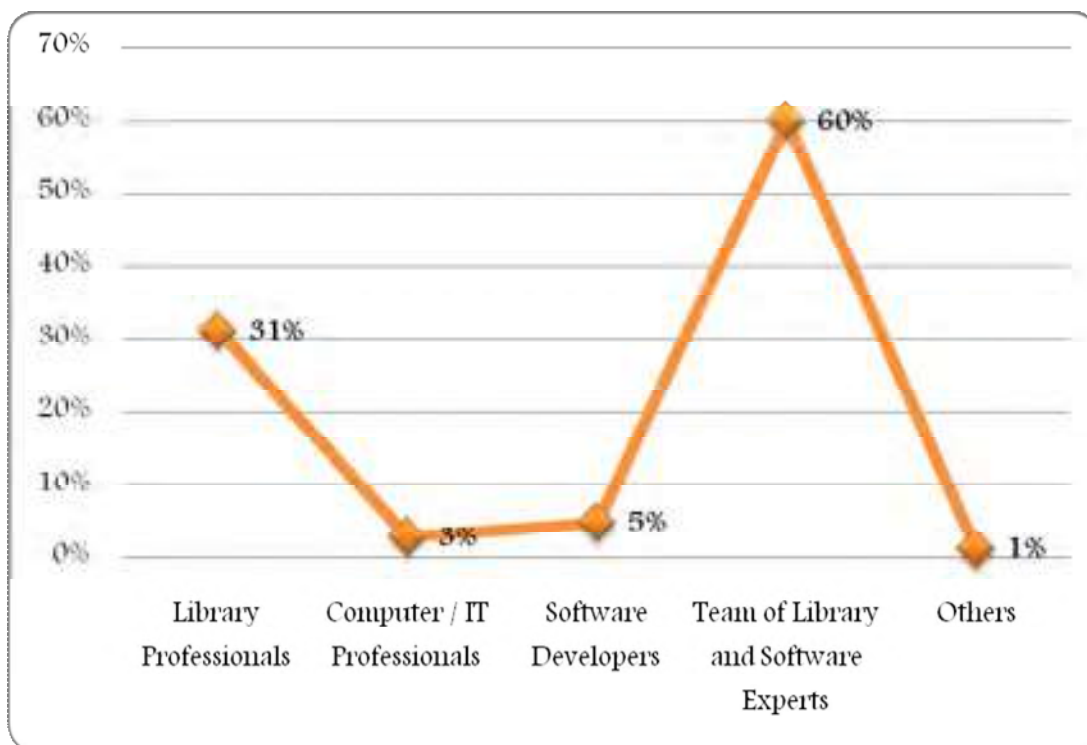
**Figure 6.10: Best Suitable OSILS**

It is found from the analysis that majority of the respondents preferred Koha OSILS as the software is suitable not only for university and college libraries, but also for all types and sizes of libraries. Koha has been a very successful OSILS compared to other software of similar kind. The software is extensively adopted by Indian libraries and is constantly supported by the user community, which is influencing other libraries to adopt Koha for smooth running of their library functions.

#### **6.4.12. Documentation on OSILS**

In OSILS, both users as well as developers produce documentation on its installation and answer queries related to installation and maintenance issues and also prepare installation guides. There was a question as to who should write documentation for OSILS? An overwhelming majority of the respondents (60%) indicated that a team of library and software experts should write the documentation for the software. However, 31% of the respondents preferred only library professionals to prepare documentation for the ILS. 5% said that software developers should be responsible for preparing the documentation. No respondents supported the involvement of software vendors to write the documentation for the system where-as 3% opined that computer / IT professionals also can prepare the documentation. The representation of the analysis in graphical format is given in Figure 6.11.

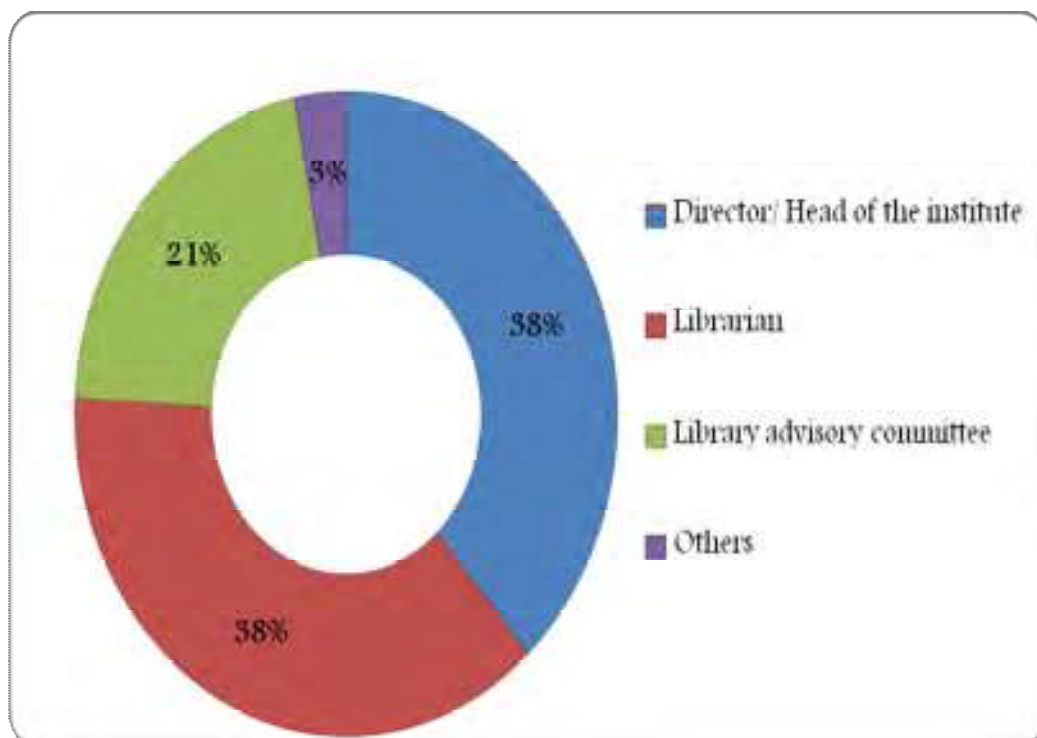
Users of the software have the experience to write documentation about installation and maintenance. However, considering their level of knowledge in software code, programming language etc., a team of both library as well as software experts joining together will help enhance the quality of documentation even for technically less experienced professionals to understand and adopt OSILS without much effort. Moreover, library professionals can learn more about the architecture and functions of the software.



**Figure 6.11: Ideal Authors to Write OSILS Documentation**

#### **6.4.13. Decision-Makers on ILS Adoption**

Respondents of the survey were asked to indicate the library authority who was responsible in making final decision on the selection of ILS. The following options were provided: Director/ Head of the institute, Librarian, Library Advisory Committee, IT/Computer team, Consortium members, Users and Others. There were no responses received for the options such as Consortium members and Users and only 3 (1%) responses were received for the option IT/Computer team. To make the responses graphically clear the responses received for IT/Computer team were included in the option ‘Other’. Responses showed that both Director/ Head of the institute and Librarian have equal (38% each) authority in choosing the integrated system software for their library. 21% of respondents said that library advisory committee decides the type of software. Only 3% of the respondents indicated ‘Others’ such as IT professionals or computer team, the infrastructure development or purchase committee, the management, etc. as the final authority to decide the software. The graphical representation for the analysis is available at Figure 6.12.



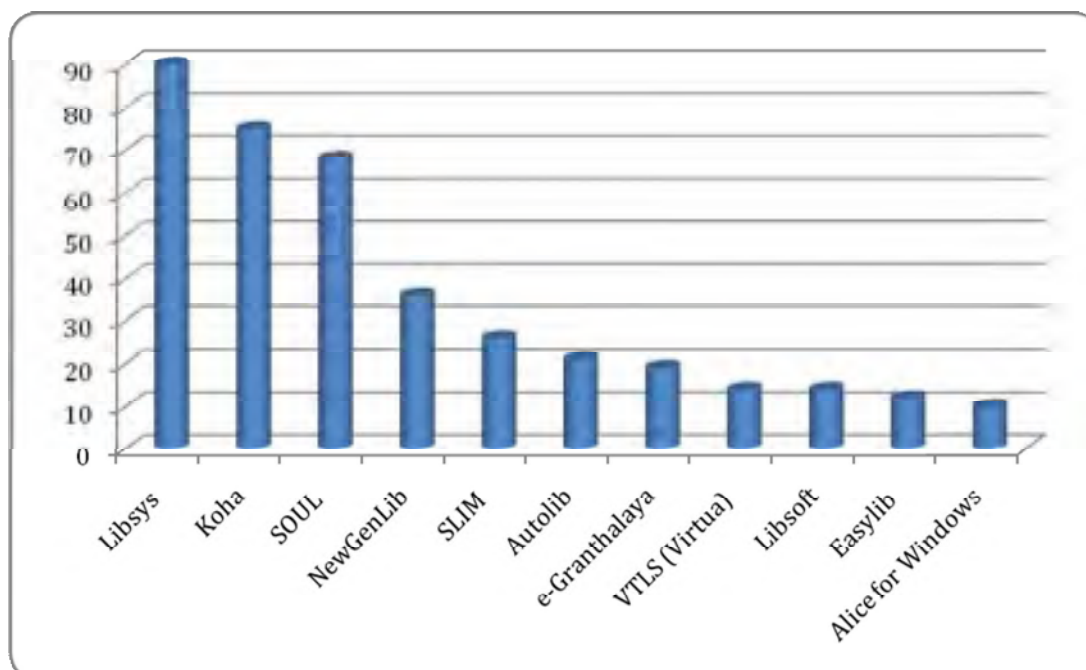
**Figure 6.12: Decision Makers on ILS Adoption**

The analysis shows that in most of the institutes librarians have the freedom to select their software. Being the member of library advisory committee librarian has a role to play in software selection. Even if the Director or Head of the institute or the Library advisory committee is the final authority to approve the software to be implemented, it is found that in all these cases librarian identifies the suitable software and then seeks their approval for purchase and payment. So the involvement of the librarian and his ability to convince the committee and authority is the key factor in finalizing the software. In some cases recommendations of the librarian is final. The other categories of responses include IT professionals or computer team, the management, infrastructure development committee etc. in which the librarian would be consulted. Overall the librarian is the prime person responsible for the selection of suitable software for their libraries.

#### **6.4.14. Adoption Rate of ILS**

Respondents were asked to name the software being used by their library with an intention to get the market trend. Surprisingly, it was noted that 90 (17%) of the total

respondents (520) were using the commercial ILS named LibSys where as Koha appeared to be the next, and first in the open source ILS stream with a usage rate at 75 (14%). The other software which are popular in Indian libraries in ILS streams are SOUL, NewGenLib, SLIM, AutoLib, e-Granthalaya, VTLS (Virtua), Libsoft, EasyLib and Alice for Windows at the rate of 13%, 7%, 5%, 4%, 4%, 3%, 3%, 2%, 2% respectively. Grapical representation for the analysis done is depicted in Figure 6.13.



**Figure 6.13: Major ILS used in Indian Libraries**

LibSys and SOUL are found to be the the two most common commercial ILS implemented in Indian libraries. In OSILS streams, Koha and NewGenLib software are highly used by Indian library professionals.

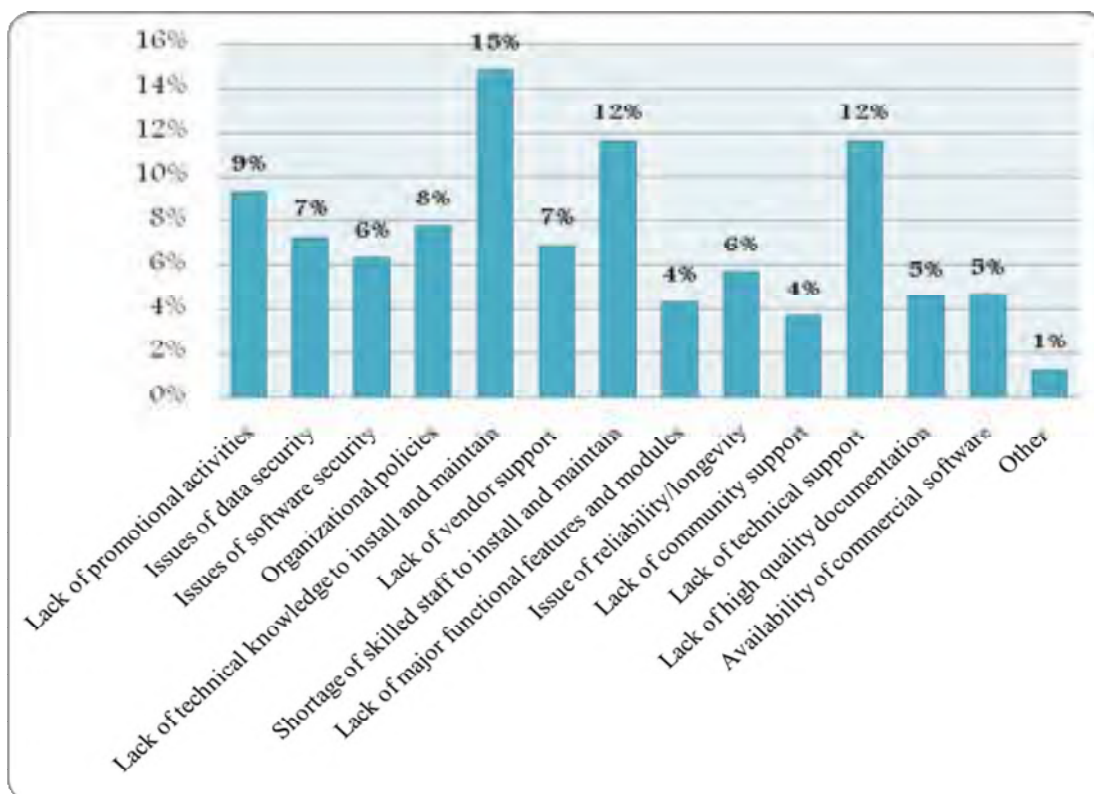
#### **6.4.15. Challenges of the Adoption of OSILS in Indian Libraries**

Adoption of OSILS for automation is an increasing trend in Indian libraries. Although the percentage of adoption of OSILS has increased in the recent years, the number of responses still reveals that the majority of library professionals in India have still not adopted OSILS due to various reasons. Survey collected data regarding the opinion of library professionals on the issues associated with wider adoption of open source ILS in comparison with commercial software. Many respondents found OSILS to be inconsistent

and hence are hesitant to adopt it because of various reasons. Respondents were asked to choose one or more options that included lack of promotional activities, issues of data security, issues of software security, organizational policies, lack of technical knowledge required to install and maintain, lack of vendor support, shortage of skilled staff to install and maintain, lack of major functional features and modules, issue of reliability/longevity, lack of community support, lack of technical support, lack of high quality documentation, availability of commercial software and other reasons to measure the level of complexity of libraries in adopting OSILS in Indian libraries on a wider scale.

Perceptions of the respondents in adopting OSILS in Indian libraries reveals that 15% of the total respondents expressed that lack of sufficient technical knowledge to install and maintain the OSILS as the major challenge in adopting OSILS. This was followed by issues such as shortage of skilled manpower to install and maintain the software and lack of technical support (12%). Lack of promotional activities (9%) is another major concern to adopt OSILS. The other common challenges represented by the respondents with equal importance are lack of vendor support, issues of data security and lack of organization policies (7%) issues of software security and reliability and longevity (6%) lack of high quality documentation and availability of commercial software (5%). It was found that OSILS has adequate community support and rich in major functional features and modules and only 4 % responses mentioned lack of community support or lack of major functional features and modules. Graphical representation of the analysis done on the challenges of wider adoption of OSILS in India libraries are represented in Figure 6.14.

The survey, informal discussions and interviews with professionals and the visit to many libraries revealed that the main barriers for the wider adoption of OSILS among Indian libraries are lack of technical knowledge and shortage of skilled staff to install and maintain, and lack of technical support from service provider or software developers. According to Koneru, staff competencies are critical when upgrading an existing system or implementing a new system (Koneru, 2005).



**Figure 6.14: Issues on Wider Adoption of OSILS**

The respondents suggests a variety of reasons for the slow adoption of OSILS in India which includes technical ability required to install the software, modify its source code and carry out maintenance, issues with technical support, data and software security, skilled staff, lack of promotional activities, poor documentation. It states that computer is only an extension of human brain's functions of data processing and its manipulation by machines. So human being/staff is the most important component of an automated system. They need to be trained and proficient to work with all the important components of the system (Raman, 1992). This is very relevant in OSILS environment. The issues compel professionals to depend on commercial agencies or community organizations, which involve a cost factor. Communicating the benefits and limitations of an OSILS in its functionalities and features compared to its commercial counterparts to the less technically experienced is also a challenging task for librarians if they are not concerned about the cost factor. It is clear from the responses that there are issues that need to be seriously addressed in the context of adoption of OSILS, which can help the professionals to consider the OSILS rather than a risky alternative.



#### **6.4.16. Reasons Pointed Out by the Respondents**

Though library professionals are interested to adopt OSILS for their libraries, lack of technical support and effective training for customization and maintenance of the software limits their ability to introduce, expand and maintain the software. OSILSs are cost effective solutions to compete with its commercial counter-parts, however many concerns hinder library professionals from adopting it. Lack of confidence, knowledge and proficiency in the application of OSILS and lack of taking initiatives and attaining self-reliance are the common reasons among professionals for continuing with their legacy proprietary systems. Some of the other challenges represented by the respondents are listed below.

- Less interest in profession due of lack of knowledge and work proficiency
- Lack of understanding of the benefits of adopting OSILS
- Lack of taking initiatives and striving towards self reliance
- Illegal benefits from proprietary software vendor to Librarian
- Freedom of usefulness from commercial software
- Lack of awareness on the advantages of OSILS adoption among higher officials
- Ignorance and lack of knowledge of the problems of proprietary software
- Issues related to finance / budget
- Lack of interest
- Lack of confidence in OSILS among professionals
- Lack of sufficient time to do customization and up-gradation
- Lack of confidence to use OSS
- User-friendliness of proprietary LMSs
- Lack of will to take challenges
- Issues of digital divide
- Non availability of power supply due to power cuts for hours together
- Poor consideration for libraries at all stages of management decisions

#### **6.4.17. Freedom and Flexibility**

The ever-changing needs of libraries compels them to adopt the system that is flexible for constant modification. OSS is continuing to gain momentum among the library community across the world. It is assumed from the analysis of data collected that the rate of adoption of ILS is high in states such as Maharashtra, Karnataka, Tamil Nadu and Kerala compared to other states. As the majority of the respondents were male candidates it was also assumed that male professionals are more in favour of library automation using ILSs. The study also assumed that LIS professionals in the age group of 31-40 were very keen in adopting ILSs compared to the age group below and above this range. The final results of the study also found that the rate of adoption of ILS is higher in academic libraries, college libraries in particular and is minimum in school, public, non-profit institute and corporate libraries.

Libraries which have adequate staff with necessary skills and experience to implement and customize the software can highly benefit with the vast potential of Koha. The success of adopting any ILS basically depends upon the attitude of the library professionals and adequacy of technical manpower. It is true that there should be a dedicated and enthusiastic team of library staff with adequate literacy in computer applications for a successful library automation process. A regular and constructive communication among the staff is also a must if the library intends to install and maintain the software on their own. Adequate planning as well as support from technical staff is also very much essential to complete the automation within a stipulated time. Staff involvement will make things more reliable as every step of installation and maintenance involves the library staff who actually carry out the work. Comparatively the proportion of semi-professionals is found to be lesser than Professionals and Non-Professionals and only few libraries in India has strength of supporting staff above 21.

It is found from the analysis that the response rate for libraries using OSS was comparatively less than the commercial software which indicates that the rate of adoption of open source ILS is limited in Indian libraries. However there is a drastic enhancement in the adoption of ILSs in Indian libraries for the last decade and the progression was marked with a 25% improvement in the year 2009-2011 compared to the year range of 2006-2008

which indicate the increased interest of Indian libraries in adopting ILS. It is clear from the analysis that 95% of the total respondents had awareness of OSILS, which is an evidence of awareness spreading over the Indian library community. Adoption of OSILS cannot be restricted in India by the lack of awareness and knowledge in open source technology among library professionals.

The data analysis found Koha to be the highly rated ILS among the open source category. NewGenLib software stands second and e-Granthalaya arrives third under open/free software category. Koha software adoption was highly supported by the respondents and extensively adopted in Indian libraries. In the case of commercial / proprietary software, LibSys was found to be the most rated software followed by SOUL and SLIM. On questioning who should write documentation for OSILS, majority of the respondents answered that team consisting of library and software experts, where as the second majority think that library professionals alone are responsible for the task. In the decisive task of selecting software, librarian or head of the library is the key person followed by head of the institution and library advisory committee. However, the pragmatic process of selection and implementation of any ILS requires the confluence of librarian, IT experts and administrative and financial decision makers to make the application self sufficient and effective. In all these responses, the significance of involvement of library professionals is vital and emphasise the need to acquire concrete and in-depth knowledge of technology by the professionals. The ability to run with the ever-changing technological aspect is one of the greatest challenges of the day. It is clear from the analysis that the respondents expressed lack of sufficient technical knowledge to install and maintain the OSILS as the major challenge in adopting OSILS and the other two being shortage of skilled manpower to install and maintain the software (12.9%). The other challenges, rank wise are (1) lack of sufficient technical expertise to support FOSS activities and service supports. Lack of promotional activities and organizational policies also prevent OSILS adoption up to some extent. Availability of quality documentations in public domain is one of the major factors which enhance the rate of adoption. Koha provides simple and user friendly documentation such as guides and tutorials. Koha requires much better and widely available documentation in Indian language to suit needs of all type of Library professionals and users as well.

## **6.5. Analysis of Attitude Of Proprietary ILS Users**

### **6.5.1. Legacy Systems and Change**

There are number of commercial ILSs available in the market and many of the software which are commonly used in Indian libraries are very costly and the application of features and functionalities varies based on the nature and service requirements of a particular library. Among the available software some are suitable only for small libraries or libraries with less collection and can handle only limited functions. Software like LibSys, SOUL, SLIM etc. can handle most of the house keeping operations of any type of library. Though the library professionals in the current era have sound awareness on the advantages of OSILSs, majority of the libraries in India are continuing with their legacy commercial systems, thereby paying a huge amount for its annual maintenance and upgradation. As a general perception, cost and performance are the two major factors to be considered while choosing an ILS. OSILS is cost effective and has same functionalities when compared to typical commercial based software. Hence it compels libraries of low budget to opt for OSILS. However, the advantages of commercial software in obtaining timely support in installation and maintenance made most of the respondents satisfied with their existing proprietary software.

### **6.5.2. Commercial ILS Used in Indian Libraries**

Users of commercial software get technical and functional support from the commercial agencies or vendors who are paid for their service on its implementation, operation and maintenance. There were around 60 different software varieties in commercial ILS category in Indian libraries. The detailed lists of software with its number of users indicated by the respondents are furnished in the Table 6.2.

**Table 6.2: List of Commercial ILS Used in Indian Libraries (n-383)**

<b>SI No</b>	<b>Software</b>	<b>No of Libraries</b>	<b>Percentage (%)</b>
01	Libsys	90	23.49
02	SOUL	68	17.75
03	In House *	26	6.78
04	SLIM	26	6.78
05	Autolib	21	5.48
06	VTLS (Virtua)	14	3.65
07	Libsoft	14	3.65
08	Easylib	12	3.13
09	Alice	10	2.61
10	ERP (Enterprise Resource Power) System	7	1.82
11	Liberty	7	1.82
12	LibMan	5	1.30
13	Nirmal B	4	1.04
14	Troodon	4	1.04
15	Bees Campus Soft	4	1.04
16	Delplus	4	1.04
17	e lib	4	1.04
18	Libsuite	3	0.78
19	Lib Technology (Lib Tech)	3	0.78
20	MODERNLIB	3	0.78

21	Rovan LMS	3	0.78
22	TCSion	3	0.78
23	EZ Library	3	0.78
24	Grandha	2	0.52
25	LIBEX Software	2	0.52
26	LIPS	2	0.52
27	LSPremia	2	0.52
28	NetLib	2	0.52
29	SMSLMS (SMS Library Management	2	0.52
30	Vidya	2	0.52
31	BookMagic	2	0.52
32	CMS	1	0.26
33	Cella System	1	0.26
34	GLAS (Graphical Library Automation	1	0.26
35	InfoLibrary	1	0.26
36	Librarian 5.6	1	0.26
37	Library management software	1	0.26
38	Library Software	1	0.26
39	Libris	1	0.26
40	LIBRERIA	1	0.26
41	LIBWARE	1	0.26
42	Lyceum	1	0.26

43	MICM Net Solutions Library Software	1	0.26
44	MIS	1	0.26
45	Phoenix Informatrix LMS	1	0.26
46	QSNET	1	0.26
47	Scholar	1	0.26
48	Serosoft	1	0.26
49	SMARTCAMPUS	1	0.26
50	Softaid	1	0.26
51	Think NEXT	1	0.26
52	TLSS: Total Library Software System	1	0.26
53	Vridhhi	1	0.26
54	WEBSIM	1	0.26
55	Bees	1	0.26
56	Campuslib	1	0.26
57	DNA-ERP	1	0.26
58	ILS	1	0.26
59	LIBASOFT	1	0.26
60	Shikshankranti	1	0.26

\*No software name was given by the respondent

Analysis demonstrated that there were different kinds of software available in proprietary category that are used in Indian libraries and among them; Libsys and SOUL are found to be the software highly used in Indian libraries. Software developed in-house were also found to be installed in many of the Indian libraries. Software like SLIM, Autolib, VTLS (Virtua), Libsoft, Easylib, Alice for Windows, ERP (Enterprise Resource

Power) System, Liberty, LibMan, Nirmal B, Troodon, Bees Campus Soft, Delplus, e-lib etc are the other major commercial ILS software commonly used in Indian libraries.

### 6.5.3. Level of Satisfaction with General Features

Respondents were asked to rate their level of satisfaction with their ILS software. Figure 6.15 shows that overall satisfaction of users on commercial ILS in most of the general features and characteristics rated were 'moderately satisfied' to 'very satisfied'. However, satisfaction levels with the availability of features and functionalities and the facility to maintain and keep backups were indicated to be comparatively high.

Respondents were asked to indicate their level of satisfaction with the following features of their ILS.

*FF- Features and Functionalities*

*MB- Maintenance and Backups*

*CI- Customization and Integrations*

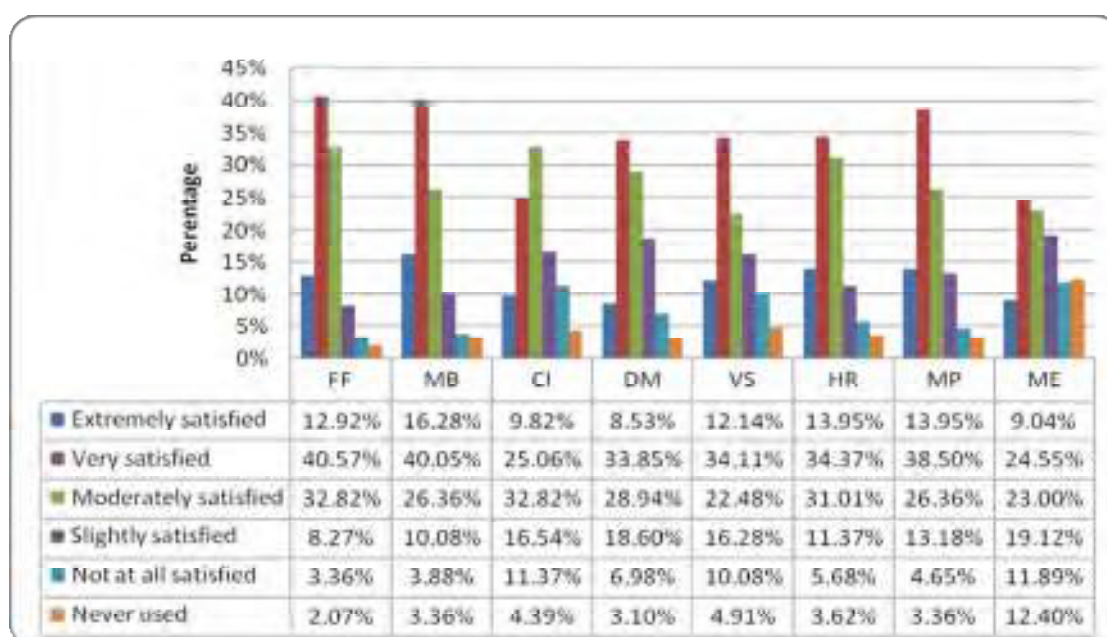
*DM- Documentation*

*VS- Vendor Support*

*HR- House Keeping and Report Generation*

*MP- Managing Print Resources*

*ME- Managing Electronic Resources*



**Figure 6.15: Respondents Level of Satisfaction with their ILS**

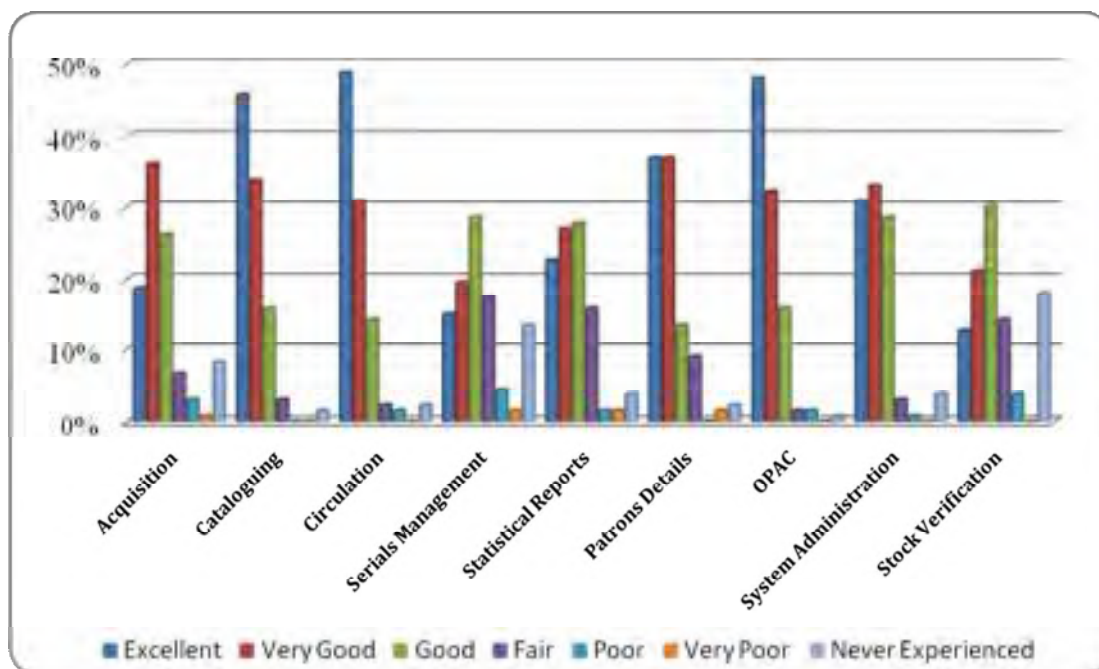


Analyzing the collected data revealed that irrespective of the type of software being used, majority of the commercial ILS users were "very satisfied" with all the software features put to test with a higher level of satisfaction with the characteristics of "features and functionalities" and "maintenance and backups" features equally. Options for managing print resources are also rated with high satisfaction followed by the features of ILS such as documentation, vendor support and facility for house-keeping and report generation. There was higher percentage of respondents with 'slightly satisfied' with the options for managing electronic resources, availability of documentation, customization and integrations and the vendor support available with commercial ILS. A higher percentage of respondents have never explored the option for managing electronic resources.

#### **6.5.4. Level of Satisfaction with Functional Modules**

ILS with minimum functional modules were found to be efficient in managing the tasks from different functions of a library. Survey respondents were asked to indicate the quality of experience with the major functional modules of the ILS being used. The basic modules commonly found in a commercial ILS are modules for Acquisition, Cataloguing, Circulation, Serials Management, Statistical Reports, Patrons Details, OPAC (Online Public Access Catalogue), System Administration and Stock Verification. The Circulation, OPAC and cataloguing modules of commercial ILS seems to be more efficient which 27%, 21% and 19% respectively of participating libraries think are excellent. Cataloguing Module (40%) and OPAC Module (39%), a cognitive task of managing records have gained popularity among modules of commercial ILS and the respondents marked it as "very good". Software generated reports are comparatively less in Indian libraries which may be due to the difference between the format available and requirement with different software and libraries. Modules for recording patron's details, managing serials and retrieving statistical reports in commercial ILS received only 'Good' by the majority of the respondents at the rate of 33%, 30% and 30% respectively. The present survey revealed that 11% professionals see the stock verification module in commercial ILS as 'poor' and this is followed by serials management (10%), statistics reports (8%), system administration (6%), patrons' details (6%), OPAC and acquisition (4%), cataloguing (3%) and circulation (2%). In the modules that were never experienced, the stock verification

module obtained the highest of 13% followed by serials management (9%) and acquisition (7%). However, in view of the overall number of modules, the rate of ‘poor’ and ‘never experienced’ are significantly less which points to the competitiveness of ILS in the market. The level of experience of the respondents with the modules of commercial ILS is graphically represented in Figure 6.16.

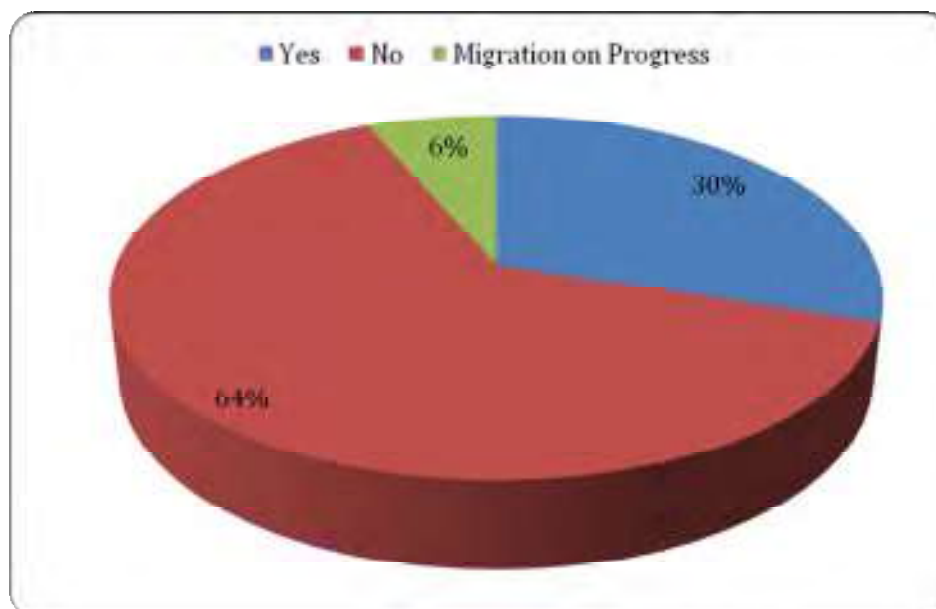


**Figure 6.16: Experience on Functional Modules of Commercial ILS**

#### **6.5.5. Considering Migration/Adoption of OSILS**

Indian library professionals face many challenges and constraints in adopting OSILS, which force them to go forward with their proprietary software by paying huge maintenance and up-gradation charges to the commercial service providers. Result of the survey among Indian library professionals indicated that a large percentage of the respondents recognized the advantages of OSILS adoption in libraries as the software is available for zero cost to adopt in an uncomplicated way and which also facilitates free customization according to the local requirements of the library. The survey also tried to know their plan to adopt OSILS (Is Your Library Planning to Adopt OSILS?). Though migrating to an OSILS from a commercial or proprietary software is a great way to cut the expenses, analysis shows that a major percentage (64%) of the respondents are not planning

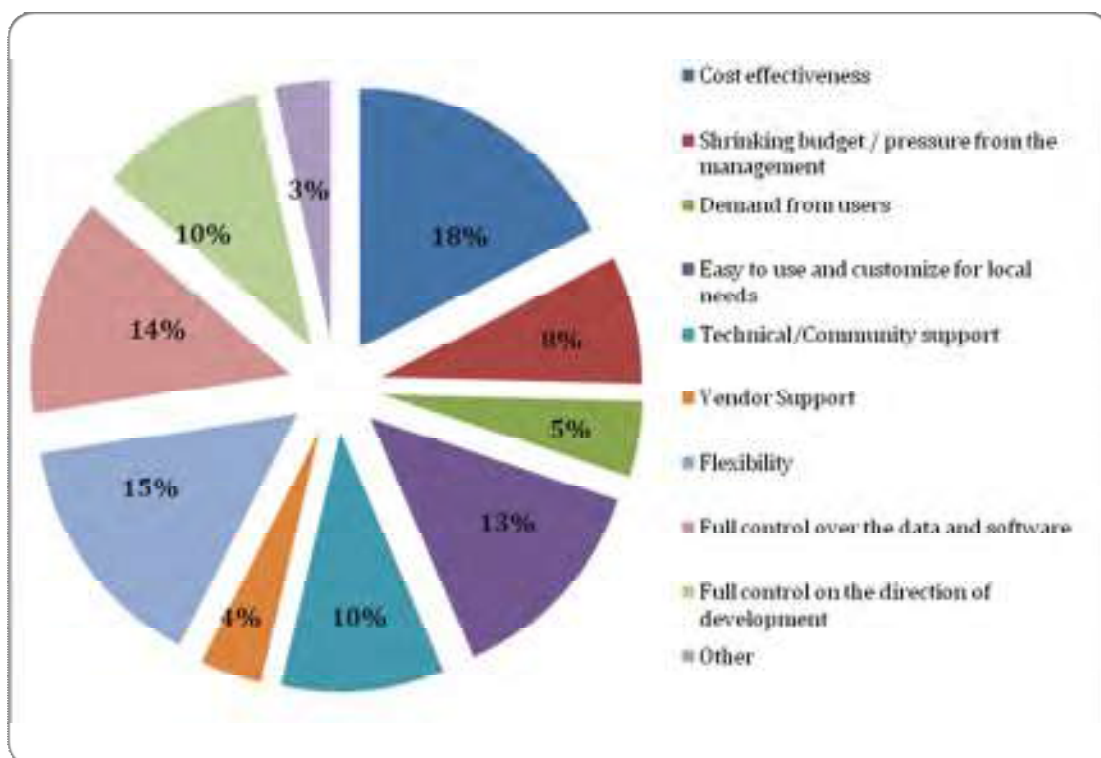
to adopt OSILS. It seems they are happy with their ILS. Diagrammatic representation of the analysis is showed in Figure 6.17.



**Figure 6.17: Plan to Adopt OSILS**

#### **6.5.6.Reasons for Considering Migration to OSILS**

OSILS is a welcome solution for libraries operating with low budget, which helps to cut down the cost involved in the purchase, installation and customization of costly commercial software. Attempts have been made to probe the reasons that are hindering Indian libraries from adopting or migrating to OSILS and the respondents to the survey reported various reasons regardless of the type and size of the library. A total of 36% of respondents plan to adopt OSILS because of the reasons such as cost effectiveness (18%), flexibility, (15% ), full control over the data and software (14%), easy to use and customize for local needs (13%), technical/community support (10%) and full control on the direction of development (10%). The other important reasons listed by the respondents included shrinking budget / pressure from the management (8%), demand from users (5%), vendor support (4%) and other (3%) includes unstable software vendors or their mergers etc. Analysis is diagrammatically represented in Figure 6.18.



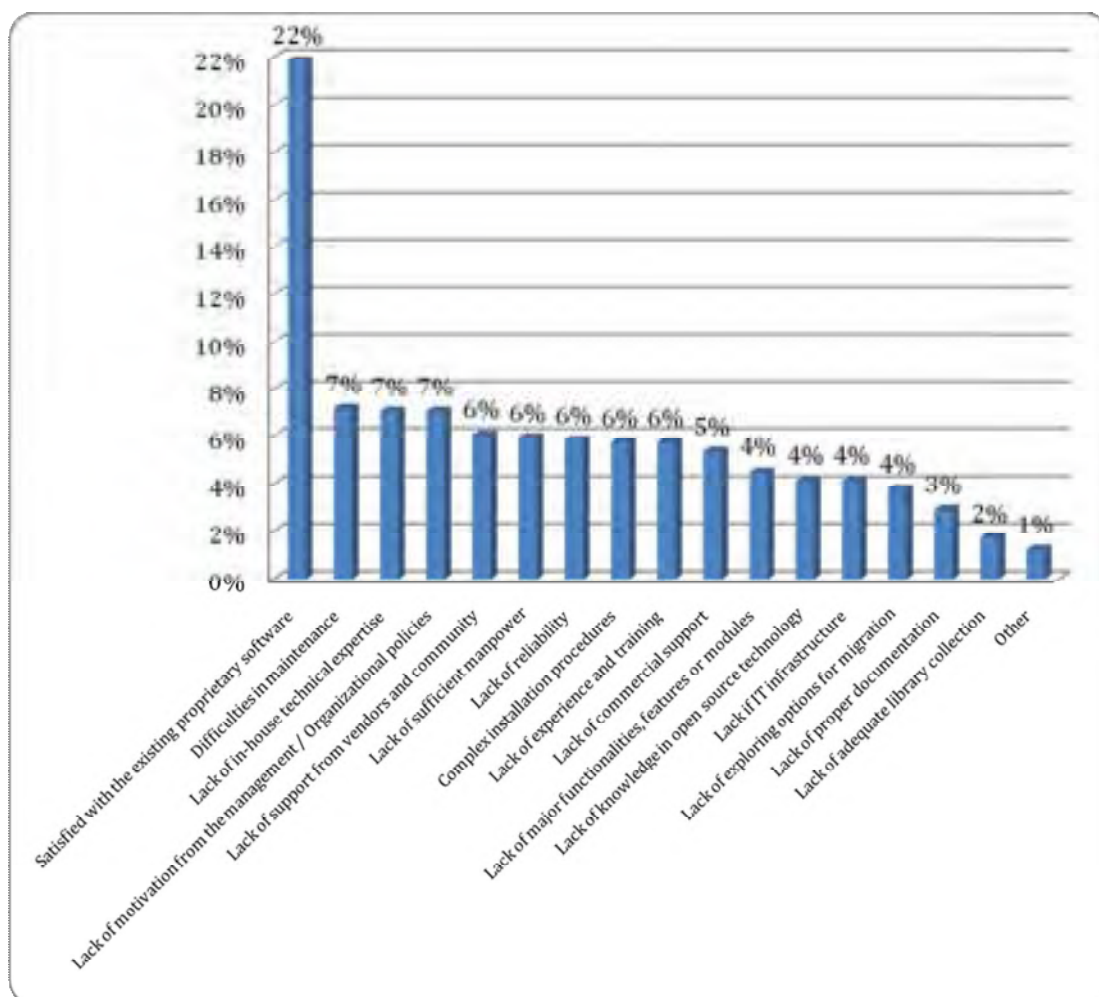
**Figure 6.18: Reasons for Migration to OSILS**

The main advantage and attraction of any OSILS is its lower cost. However it is clear from the responses received from propriety packages used that cost saving is not the only factor why libraries adopt OSILS. According to respondents significant benefits offered by OSILS as a reliable solution for automation include flexibility, full control over data and the software, and easy to customize according to the specific needs of a library. Flexibility in the software for further enhancements and developments is a major factor. Availability of technical and community support and the demand from users were also found to be strong incentives to adopt OSILS. Libraries facing shrinkage in budget and current users of commercial software for reasons stated above consider migration to OSILS. Being an attractive alternative for any type of libraries respondents found that OSILS are free to experiment and easy to use and customize for local requirements. OSILS were also found to be a viable and low cost solution for libraries and are known for its reliability and desirable features. Data and software security of OSILS are also making them suitable for libraries to adopt.

### **6.5.7.Reasons for Not Considering Migration to OSILS**

The study sought to establish the reason why Indian library professionals are still using commercial ILS and is slow to adopt OSILS. The respondents were asked to indicate the main reasons for not selecting OSILS according to certain selected criteria that were found to be barriers in OSILS adoption. It was found from the survey that the respondents from commercial ILS libraries cited “Satisfied with the existing proprietary software (23%)” as one of the primary reasons for not changing to OSILS. The next ranked issues were difficulties in maintenance (8%), lack of support from vendors and community (6%), lack of in-house technical expertise (6%), complex installation procedures (6%), lack of reliability (6%), and lack of motivation from the management / organizational policies (6%) etc respectively. Lack of major functionalities, features or modules (5%), lack of commercial support (5%), lack of experience and training (5%) and lack of sufficient manpower (5%) are the other major reasons for rejecting OSILS. Lack of knowledge in open source technology (4%), lack of exploring options for migration (4%), lack of proper documentation (3%), lack if IT infrastructure (3%), other (2% ) and lack of adequate library collection (1%) were also found to be matters of concern which prevent the users of commercial ILS to not opt for OSILS. Analysis is represented by graph in Figure 6.19.

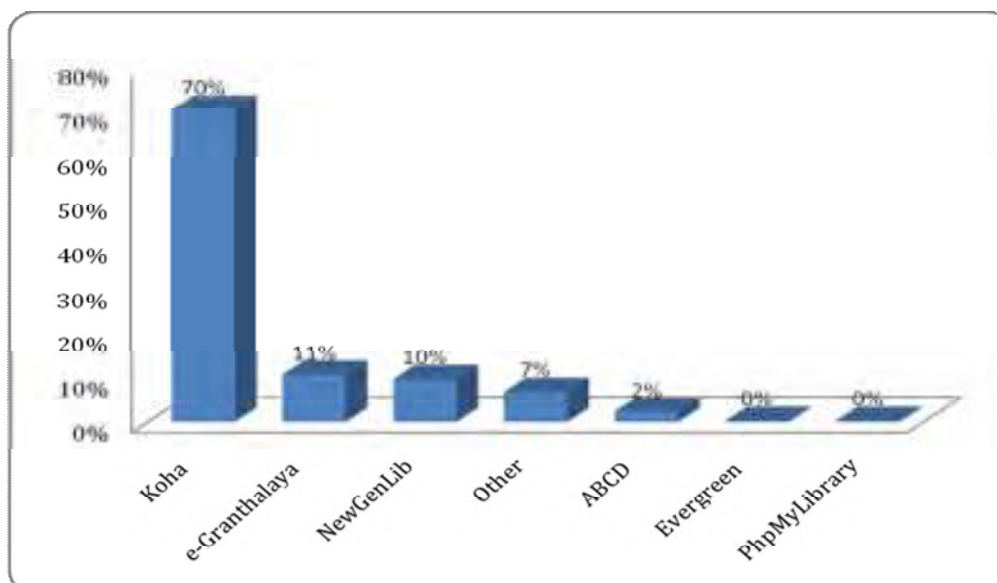
Exporting the existing bibliographic data into a standard format, or directly to the selected OSILS which is to be supported by the software, is a basic requirement before migrating to an OSILS. Participants of the survey expressed that though they are satisfied with the existing commercial ILS, inadequacy with software related issues such as support from vendors and community, reliability, major functionalities, features or modules, commercial support, exploring options for migration, proper documentation etc. force them to stick on to commercial software. Managerial issues such as knowledge in open source technology, IT infrastructure, adequate library collection, in-house technical expertise, motivation from the management and organization, experience and training, sufficient manpower etc. are also major concerns in adopting OSILS.



**Figure 6.19: Reasons for not Considering Migration to OSILS**

#### **6.5.8. Preferred OSILS**

Choosing an appropriate ILS is a challenging task for library professionals. The software selected should have minimum features to meet the library's requirement and it should have community and vendor support along with frequent updates. Though library professionals in India are enthusiastic and willing to adopt OSILS, in order to identify the most preferred OSS, respondents presently using commercial ILS were asked to indicate their preferred OSILS irrespective of the software they were using. Result of the analysis is graphically represented in Figure 6.20.



**Figure 6.20: Preferred OSILS**

The result of the response shows that majority of respondents has selected Koha ILS as their preferred software.. It appears that the professionals from India realised the full potential of the functional capabilities of Koha software to automate their library. The less popular NewGenLib and e-Granthalaya are the other two software preferred by the respondents.

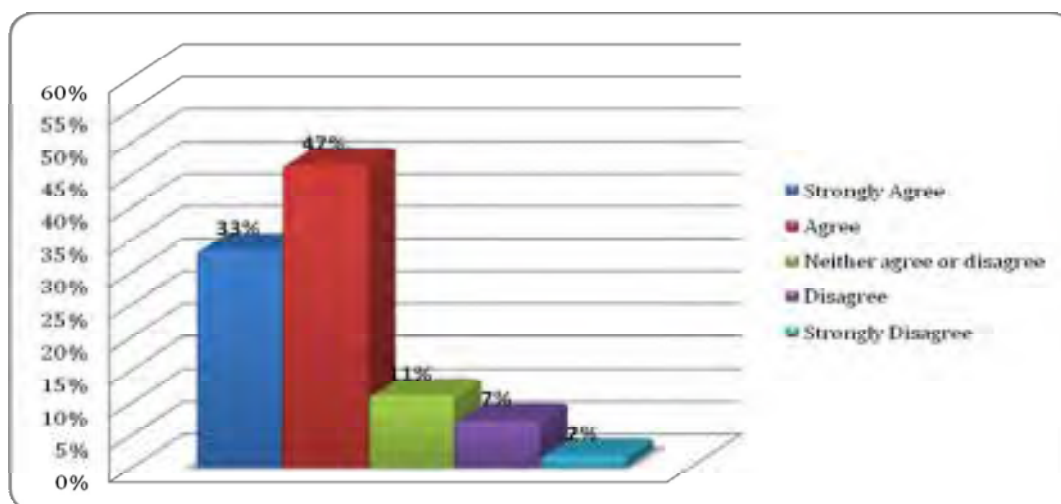
#### **6.5.9. Agreement with Selected Statements on OSILS**

Respondents who are users of proprietary software were asked to indicate their level of agreement with some selected statements on OSILS to determine the views of library professionals towards its adoption in Indian libraries. The responses to each statement were recorded using Likert scale response anchors as 1- Strongly Disagree, 2- Disagree, 3- Neither agree or disagree, 4- Agree and 5- Strongly Agree. The descriptive statistics of the analysis showed that they had positive approach towards OSILS adoption in Indian libraries.

#### **OSILS Requires More Technical Expertise**

Majority of respondents either agreed or strongly agreed that OSILS requires more technical expertise than a commercial one and that would be the reason why the rate of adoption of OSILS is considerably low in Indian libraries. The analysis for the statement,

"OSILS requires more technical expertise than proprietary software" revealed that, 47% of the respondents agreed, 33% of the respondents strongly agreed, 11% of them had ambiguity, 7% of them disagreed, and remaining 2% strongly disagreed. Analysis is represented graphically in Figure 6.21.



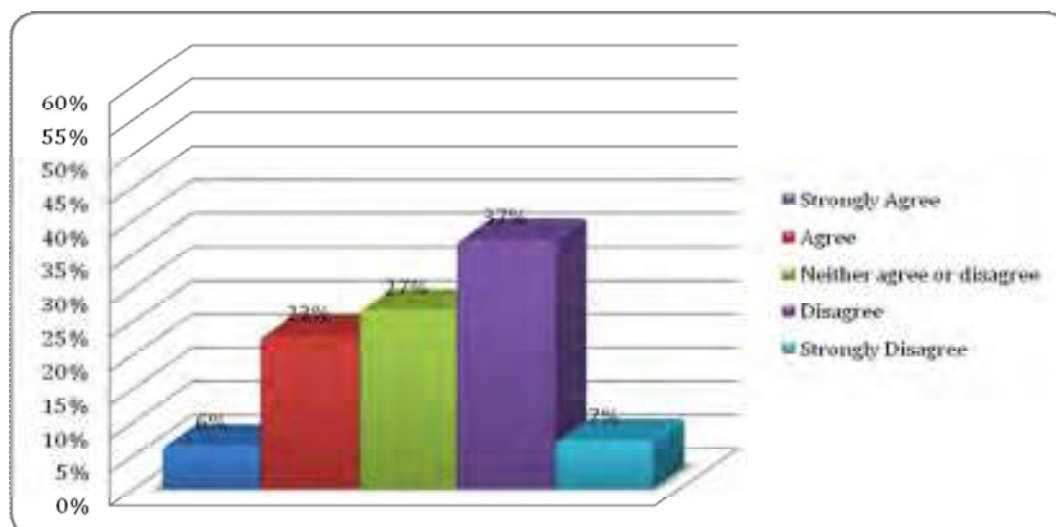
**Figure 6.21: Level of Agreement on Issue of Technical Expertise**

Implementation of OSILS can be made easy due to the availability of support from other libraries, online communities and also from commercial vendors. However, in order to customize the software for a specific need involves the support of an expert. It is clear from the responses that a higher number of respondents either agreed or strongly agreed that OSILS requires more technical expertise than commercial software and that would be the prime reason why the rate of adoption of OSILS is considerably low in Indian libraries. Most of the Indian libraries are running with lack of professional staff with technical skill.

### **OSILS Have Hidden Cost**

Respondents were asked to indicate whether the additional cost requirement in implementing OSILS is with-in in the range of their anticipation and majority (37%) revealed that they disagree with the statement OSILS are more expensive than anticipated. However while 27% of the respondents neither agree nor disagree with the statement, 23% agreed that it exceeds their expectations. A few respondents strongly agreed (6%) and another group strongly disagreed (7%) with the statement. Graphical representation of the analysis is shown in Figure 6.22.





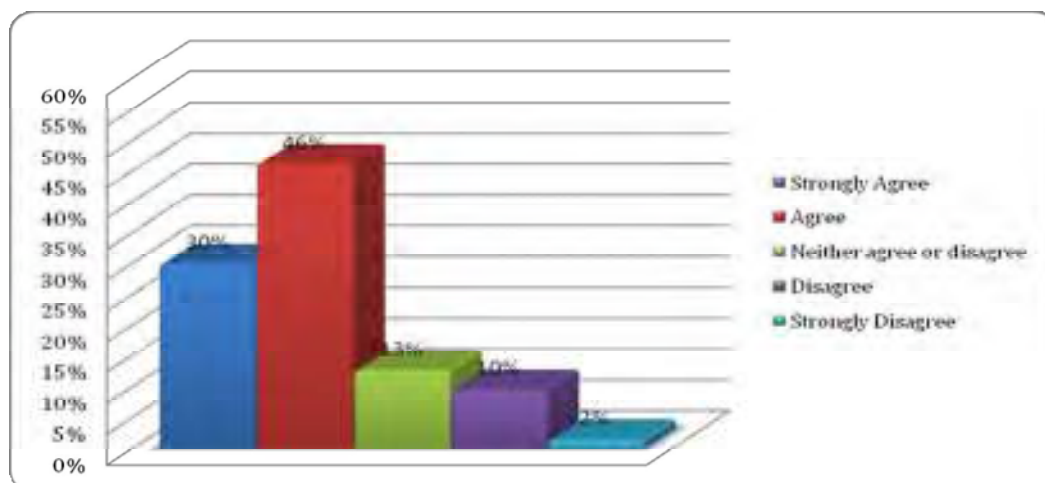
**Figure 6.22: Level of Agreement on Issue of Expense**

The result of the survey to measure the economic viability of OSILS during its implementation indicated that OSILS are within the expected financial limit of most organizations and is economical. One fourth of the respondents had an experience of exceeding financial outgoes during its implementation than anticipated. However the overall response showed that implementation of OSILS are not more expensive than anticipated. The experience of University of Mysore in migrating to Koha software by an external service provider showed that the entire process of installation and configuration, migration of existing data, training, customization, hosting on cloud and Annual Maintenance Cost (AMC) cost them one third of the costs normally spent for a medium priced commercial ILS. By adopting out- sourcing method and cloud hosting environment, the automation of a library can be easily done without spending much time and money. Moreover, libraries can save much space for keeping the server and reduce the cost of air-conditioning and its maintenance for system administration. Needless to say if the library has expertise for installation, configuration and implementation, then the cost of running the software will be zero.

### **Training is Required for Implementing OSILS**

When prompted, majority of the respondent agreed with the statement “Exhaustive training is required for implementing OSILS”. The distributions of the percentage level of agreements is strongly agree (30%), agree (46%), neither agree or disagree (13%), disagree

(10%) and strongly disagree (2%). Result of the analysis is graphically represented in Figure 6.23.



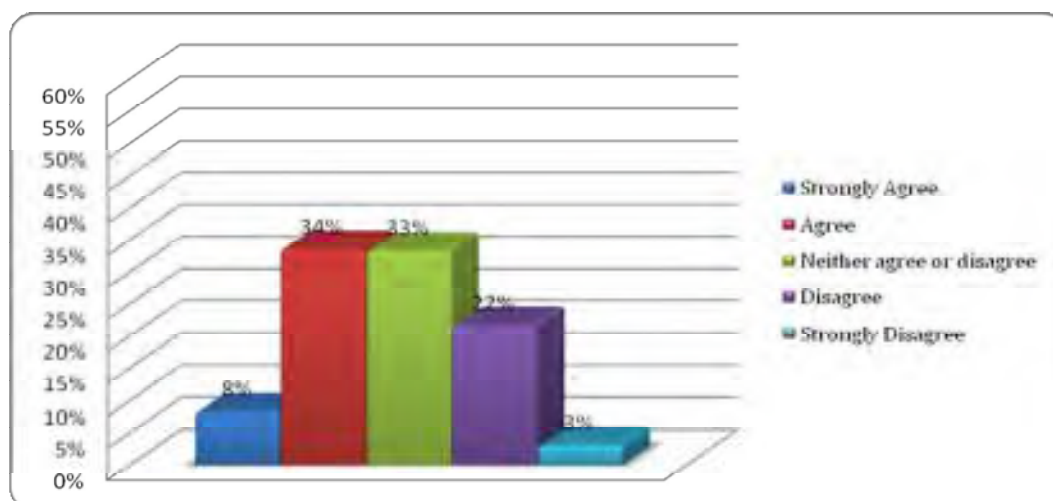
**Figure 6.23: Level of Agreement on Issue of Training**

In order to familiarize the library professionals with OSILS adoption and installation, frequent training programs and workshops should be conducted. Proper hands-on training provisions for the professionals also may enhance the wide-spread use of OSILS. Effective training for the customization and maintenance of OSILS should be provided to inculcate and nurture the required skills in professionals. Attendance in workshops, seminars etc. enhance the knowledge of professionals on the advantages and possibilities of OSILS applications in libraries and to familiarize the library professionals with OSILS adoption and installation. National Library Automation and Resource Sharing Network (NLARN), which is funded and supported by the Ministry of Human Resources Development, Government of India under its National Mission for Education through ICT (NMEICT), National Institute of Science Communication and Information Resources (NISCAIR), New Delhi, Information and Library Network (INFLIBNET) Centre, Gandhinagar, and Delhi Library Network (DELNET), New Delhi etc. frequently organizes awareness programs on OSILS.

### **OSILS Lacks Scalability**

The responses for the statement "OSILS lacks scalability" were mixed in nature where 8% strongly agreed, 34% agreed, 33% neither agreed or disagreed, 22% disagreed and 3% strongly disagreed with the statement. However one third of the total respondents

agreed that OSILS are scalable solutions to handle the load and can meet the needs of any kind of libraries. The rating scale of 1-5 to get user's opinions on the scalability of OSILS indicates that though a majority of them agree with the statement many of the respondents could neither agree or disagree with lack of scalability in OSILS. Figure 6.24 shows the graphical representation of the analysis.

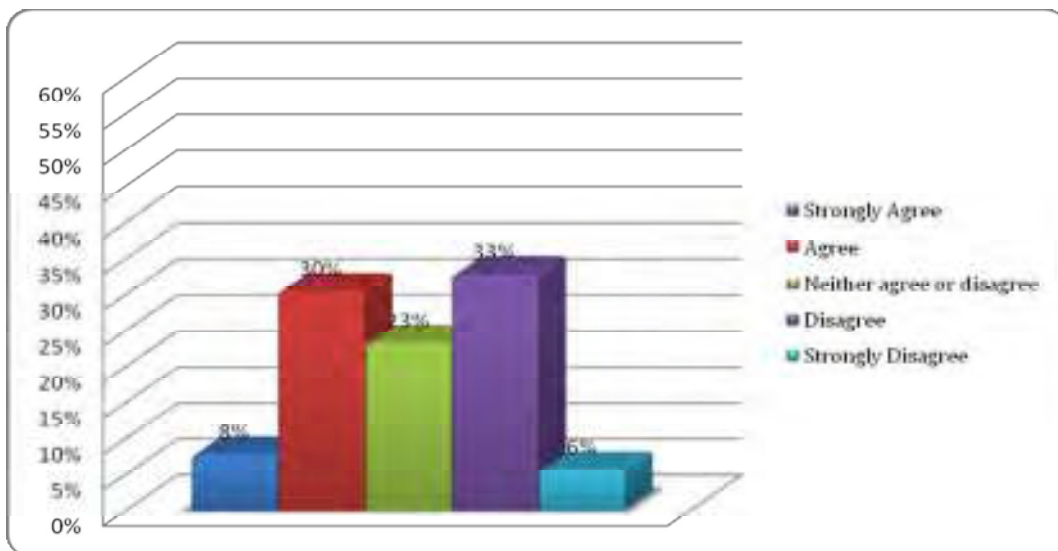


**Figure 6.24: Level of Agreement on Issue of Scalability**

Provision for scalability or expandability is one of the important characteristics of an OSILS. It is found from the study of total respondents that a higher majority of them agreed that OSILS are scalable solutions to handle the load and can meet the needs of any kind of libraries. The modification in the application with time is facilitated in OSILS and that is its most unique feature.

### **Ability of OSILS to Meet Current and Future Demands**

When prompted “OSILS lack ability to meet current and future demands of the library”, 30% of the respondents agreed, 8% of the respondents strongly agreed, 23% of them had ambiguity and represented as neither agreed or disagreed, 33% of them disagreed, and remaining 6% of them strongly disagreed. However, the statement is not true as the higher majority of the respondents disagreed with the statements. Hence, it is to be assumed that present OSILS solutions are capable of meeting the current and future demands of any library. Figure 6.25 depicts the graphical representation of the analysis.

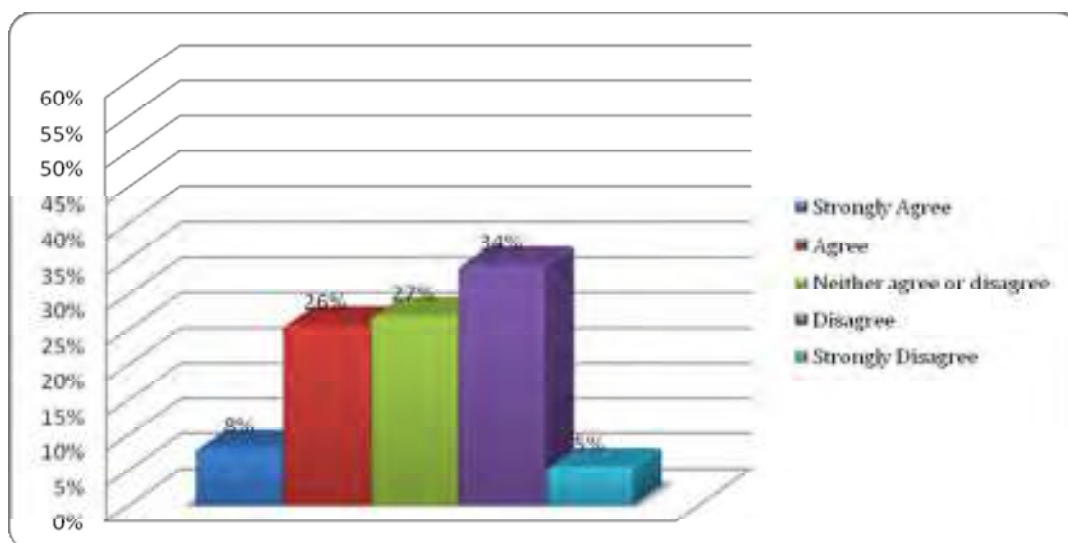


**Figure 6.25: Level of Agreement on Issue to Meet Library Demands**

Result of the analysis shows that the available OSILS solutions are capable of meeting the current and future demands of any library. However, the statement inclines towards positive side as the higher majority of the respondents disagreed with the statement. The open source environment offers many prospects to bring about timely changes in the information business and it has become possible to bind the present and future requirements because of the increase in availability of varieties of open source applications today. OSILS has every possibility to take shape according to user's requirements.

### **OSILS Lack Advanced Features**

For the statement "OSILS has only fewer advanced features", 26% of the respondents agreed, 8% of the respondents strongly agreed, 27% of them had ambiguity, 34% of them disagreed, and remaining 5% of them strongly disagreed for the statement Equal number of respondents either agreed or disagreed with the statement. However as the OSILS products are developed over many years in a collaborative manner and are updated frequently, they can have more advanced and updated features. Figure 6.26 shows the graphical representation of the same.

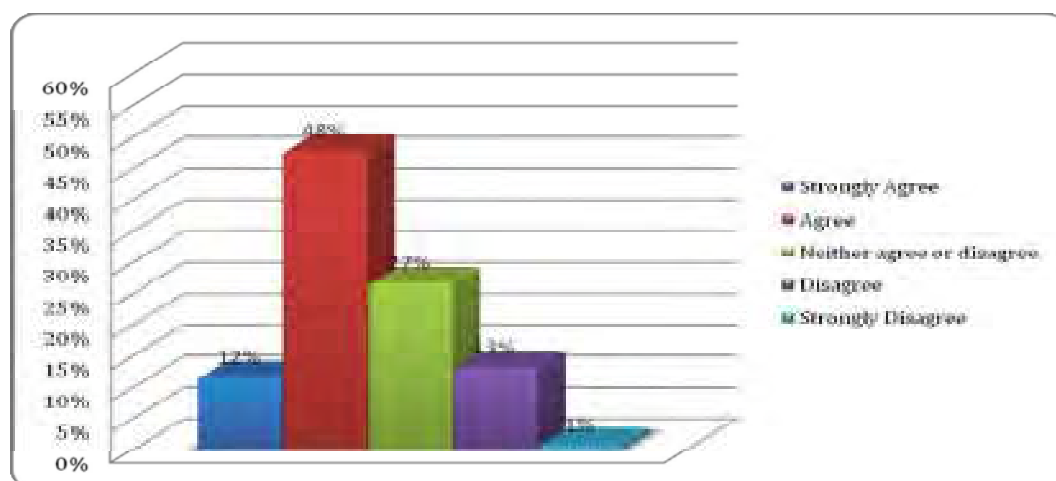


**Figure 6.26: Level of Agreement on Issue of Advanced Features**

Analysis of the statement shows that as the OSILS products are developed over many years in a collaborative manner and are updated frequently, users can have more advanced and updated features even though a majority disagreed. In recent years, the concept of cloud computing also supports OSILS. Cloud based hosting service of OSILS considerably reduces the cost of hiring technical staff and purchase of hardware; however library needs to pay an annual subscription to the service provider. Most of the OSILS today adhere to prescribed standards such as MARC, Z39.50 etc. OPACs of OSILS have been developed to be web enabled. They are compatible with Web 2.0 applications and also cloud computing which are most appropriate for a modern library' information service systems.

### **Effect of OSILS on the Proprietary ILS Market**

When prompted "Entry of OSILS had a major effect on the proprietary ILS market?" the respondents replied in such a way that 12% strongly agree, 48% agree, 27% neither agree or disagree, 13% disagree and 1% strongly disagree. Analysis is graphically represented in Figure 6.27.



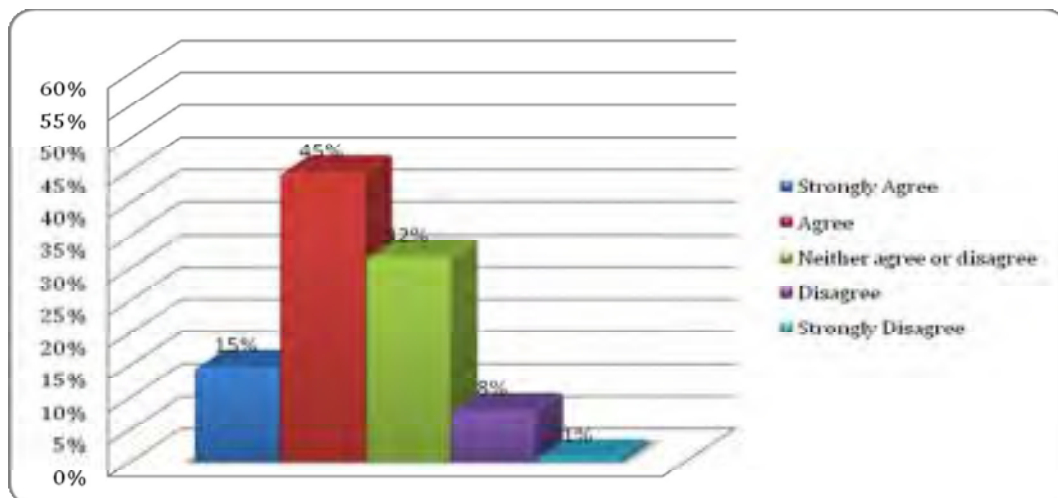
**Figure 6.27: Level of Agreement on Issue of OSILS Vs Proprietary ILS**

The usage rate of OSILS in Indian libraries indicates that majority of the libraries are interested in adopting or migrating to OSILS. The entry of OSILS has had a major effect on the proprietary ILS market due to its availability and support for all levels of library operations similar to commercial software. There are success stories where libraries using commercial software have migrated to OSILS and have been able to customize the applications as and when required. Moreover, library professionals can take part in the development and customization of the software according to their specific requirements.

### **OSILS Increases Efficiency**

When the response to statement “OSILS increases the efficiency of the library services” were analyzed, a higher majority (45%) of the respondents were found to have agreed with the statement and 15% of the respondents strongly agreed with the impact of OSILS in increasing the efficiency of the library services. However, 32% respondents neither agreed nor disagreed 8% respondents fell in the category of disagreed and strongly disagreed. Analysis done is graphically represented in Figure 6.28.

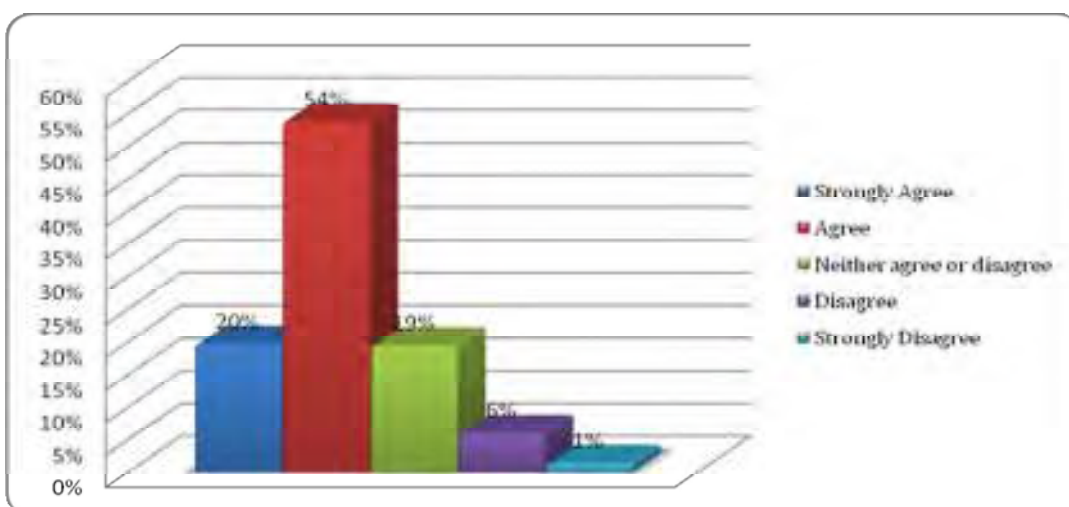
Libraries that have moved to OSILS from commercial software have found enhancements in the efficiency of their library services. During implementation of OSILS, library staff is required to acquire minimum technical skills to handle the issues and up keep of the system. Eventually, contemporary and advanced technologies are tailored to the main application to enhance the efficiency, which indirectly demands the upgradation of information professionals’ knowledge on technology.



**Figure 6.28: Level of Agreement on Issue of Efficiency**

### **OSILS Gives Financial Advantages**

In OSILS, availability of source code and ease in installation and maintenance made the software popular among professionals. Moreover, expenditure is incurred in system administration, maintenance, hardware requirement, staff training and facilities management etc. are low compared to commercial software. More than half (54%) of the total respondents agreed with the statement “OSILS gives financial advantages as compared to commercial ILS” apart from the strongly agree response of 20%. 6% respondents disagreed with the statement and 1% strongly disagreed where as 19% respondents neither agreed or disagreed. Figure 6.29 shows its graphical representation.

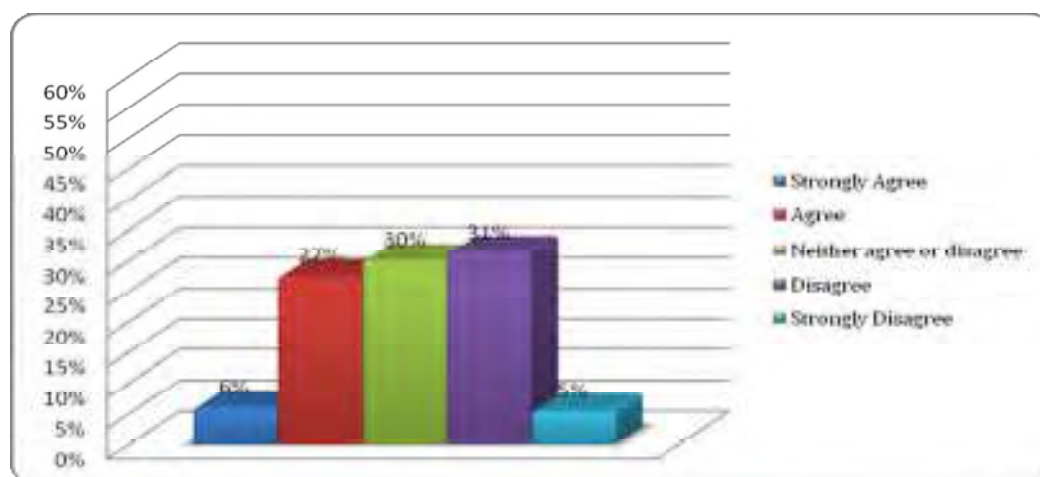


**Figure 6.29: Level of Agreement on Issue of Financial Advantage**

OSILS are becoming more prominent by creating revolutionary changes in modern information sector. OSILS is free in its availability of source code, but involve expenditure in system administration, maintenance, hardware requirement, staff training and facilities management etc. As the large majority of the respondents agreed that OSILS are economically viable, it is worth considering for libraries where financial aspect is an obstacle in bringing innovative technology to their information users.

### **OSILS Has Lower Functionality**

In response to the statement "OSILS provides lower functionality than commercial software", 27% of the respondents agreed, 6% strongly agreed and 30% of the respondents neither agreed or disagreed. However 31% of them disagreed and 5% strongly disagreed with the statement. Figure 6.30 shows the graphical representation of the analysis done.



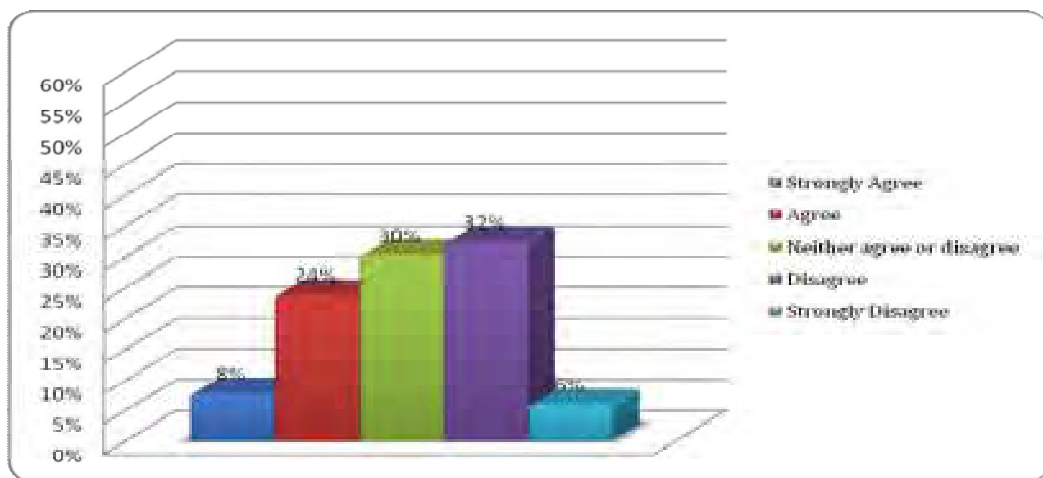
**Figure 6.30: Level of Agreement on Issue of Functionalities**

Functionality and technical support are gaining more importance in managing information resources. According to this analysis, majority agreed that OSILS provides all the functionalities that meet the needs of a particular library irrespective of its size and type. Users have to upgrade the capacity of the server from time to time to bring required speed and customization needs are to be taken care of to enable the application to function at par with the ever-changing environment of libraries. OSILS such as Koha and NewGenLib have proved to possess every possible functional feature offered by that commercial software.



### OSILS is Less User-friendly

This statement was provided to check the level of respondent's agreement with the user friendliness compared to its commercial counterpart involving web interfaces, display layouts, functional modules administrator module or client module. There was significant disagreement (32%) among respondents as they opined that OSILS is more user friendly than commercial one. However 24% of the respondents believe that the statement is true and 30% neither agreed nor disagreed with the statement. Analysis of the statement is graphically represented in Figure 6.31.

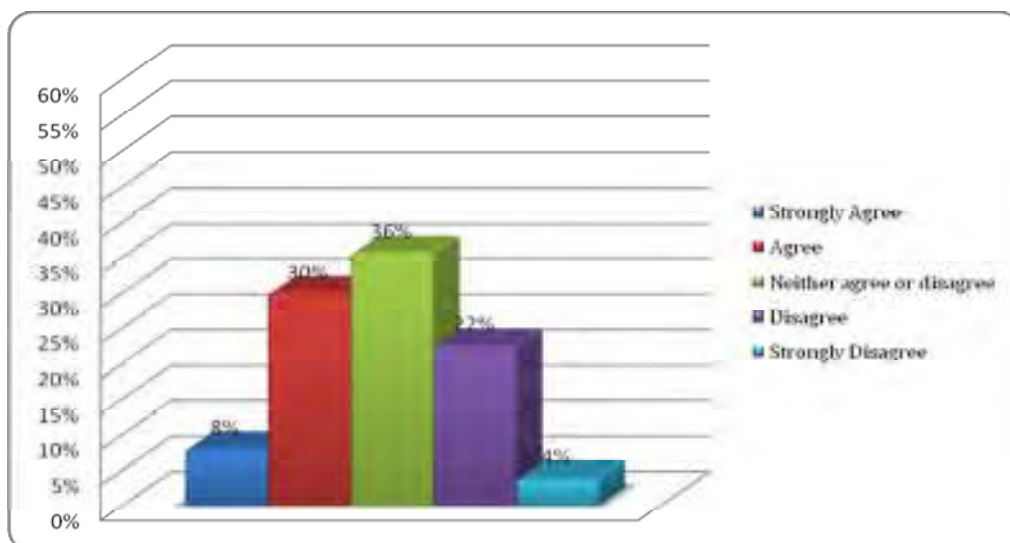


**Figure 6.31: Level of Agreement on Issue of User Friendliness**

It was well noticed from the analysis that OSILS are more user-friendly in its downloads, documentation facility and even in its interfaces and right from the installation all the functions at various levels can be learned and performed by user without external help. Consortium of counterparts, timely organised workshops, seminars and training programmes have been contributing in making OSILS more user-friendly.

### OSILS Lack Quality Documentations

Documentation is one of the major issues associated with the adoption of OSILS and availability of poor quality documentation discourages the OSILS as option of choice. The response rate of the statement "OSILS lack high quality documentations" was 8% strongly agree, 30% agree, 36% neither agree or disagree, 22% disagree and 4% strongly disagree. Figure 6.32 shows it graphically.



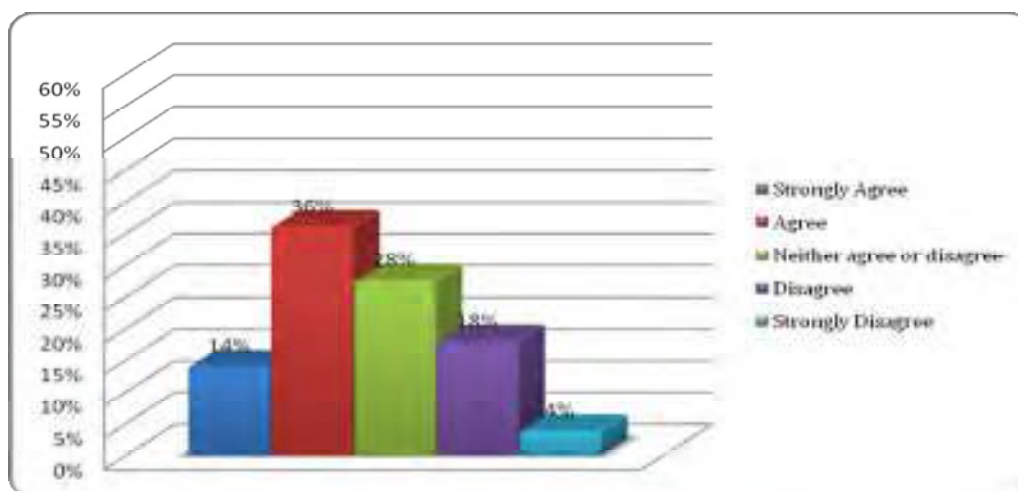
**Figure 6.32: Level of Agreement on Issue of Documentation**

Availability of good quality documentation is also an essential requirement to the success of adoption of OSILS in libraries. The documentation should be simple, easy to understand and help professionals to adopt the software without third-party assistance. Documentation should explain the methods and requirements in a step by step manner so that even a fresher should be able to complete the task without much effort. A higher percentage of the respondents agreed that the quality of documentations available on OSILS need to be improved. Some models that can be used for preparing manuals and documentations on OSILS are the simple short manuals on CDS/ISIS, GenISIS, WinISIS, Greenstone etc. prepared by Rajasekharan available in UNESCO website (Rajasekharan, 2007) and basics of CDS/ISIS or DOS prepared by Raman Nair (Raman Nair, 1999). Such simple manuals for current OSILS can be prepared in English, Hindi and other Indian languages.

### **OSILS Gives More Work for Customization and Maintenance**

Respondents of the survey were asked to indicate their level of agreement with the statement "OSILS create more work for library staff in-terms of customization and maintenance". When prompted, majority of the respondents strongly agreed (14%) or agreed (36%) that in-terms of its customization and maintenance OSILS create more work. However significant number of respondents (28%) neither agreed or disagreed with the

statement but 18% of the total respondents disagreed with the statement. Response rate of strongly disagreed respondents were insignificant (4%). Analysis done on this statement is graphically represented in Figure 6.33.



**Figure 6.33: Level of Agreement on Issue of Customization and Maintenance**

Majority of the commercial ILS users agreed that compared to the proprietary software they were using, OSILS gives financial advantages though it creates more work for library staff in-terms of its local customization and maintenance. As the OSILS allows free access to the actual computer program or source code created by the developer, it is often much easier to edit or modify the code to tailor the program according to their requirement. However, a person with limited skills in terminology and programming language will find it difficult and time-consuming and the development also may be slow. Higher level of technical knowledge is very much essential to maintain and customize an OSILS.

#### **6.5.10. Impact of OSILS**

A lot of money is being spent by libraries on commercial ILS for purchase, maintenance, support, adding new features etc, when there are software that can run as fully functional ILS free of cost. The overall responses indicate that the trend towards the adoption of OSILS in Indian libraries is increasing and the extent of adoption will be more in the future. Cost effectiveness is the major factor for many libraries to move to an OSILS. Flexibility and full control over data and software are the other major reasons. Ease of use and customization for local requirements is another reason for its popularity.

Majority of the respondents in India completely agreed with the advantages of OSILS as compared to its commercial counterparts and supported the adoption of OSILS. However, there are factors, which hold back its adoption. The major factor is their reluctance to take risks as it is a long-term commitment. The lack of technical skill to install and maintain the software also reduces the rate of adoption. Lack of technical expertise and support and poor knowledge in identifying relevant software to meet the requirements also has some impact on the wider adoption of OSILS. Analysis of the responses of each statements revealed that the respondents showed agreement with majority of the statements pertaining to the advantages of adopting OSILS compared to commercial products. Shortage of ICT trained manpower among library professionals is also one of the reasons for the low speed of OSILS adoption. It is very important to provide organizational support for the library professionals to successfully complete the OSILS adoption in their libraries in terms of finance, technical, training and infrastructure.

The study has found that most of the respondents were in a dilemma on issues such as its scalability, efficiency to enhance the services of the library, quality documentation, functionalities and user friendliness of OSILS in comparison with commercial ILS. However, majority has not agreed with the negatively charged statements such as OSILS being expensive, inability to meet current and future demands of the library, fewer advanced features and lower functionalities. It was clear that library professionals using commercial software are supportive to the adoption of OSILS and they agreed that application of OSILS as compared to proprietary software requires not only more technical expertise for implementation but also it requires exhaustive training. Commercial ILS users also agreed that entry of OSILS had a major impact on the market for proprietary software and it also increases the efficiency of the library services. Libraries of all types and sizes can consider adopting OSILS as the best way to address budget cuts and also as viable alternative to commercial ILS. However, before adopting an OSILS there should be a preliminary check conducted on the issues such as platform dependency, hardware requirements, software features, support from developer and community, availability of documentations, access permission to complete source code, availability of commercial vendor support and support for next generation characteristics etc.

## 6.6. Analysis of Attitude of OSILS Users

### 6.6.1. Usage of OSILS

Users of OSILS were asked to provide their views highlighting the capabilities and potential of the software to perform the housekeeping operations of a library. A separate descriptive survey questionnaire was prepared and the feedback is analyzed under different characteristics. Respondents of the survey gave a positive perception towards adoption of OSILS in Indian libraries. Total number of responses received from different libraries using OSILS is shown in Table 6.3.

**Table 6.3: Libraries Using OSILS (n=133)**

Software	Number of Libraries	Percentage (%)
Koha	75	56
NewGenLib	36	27
e-Granthalaya	19	14
ABCD	1	1
Evergreen	1	1
GenIsisWeb	1	1

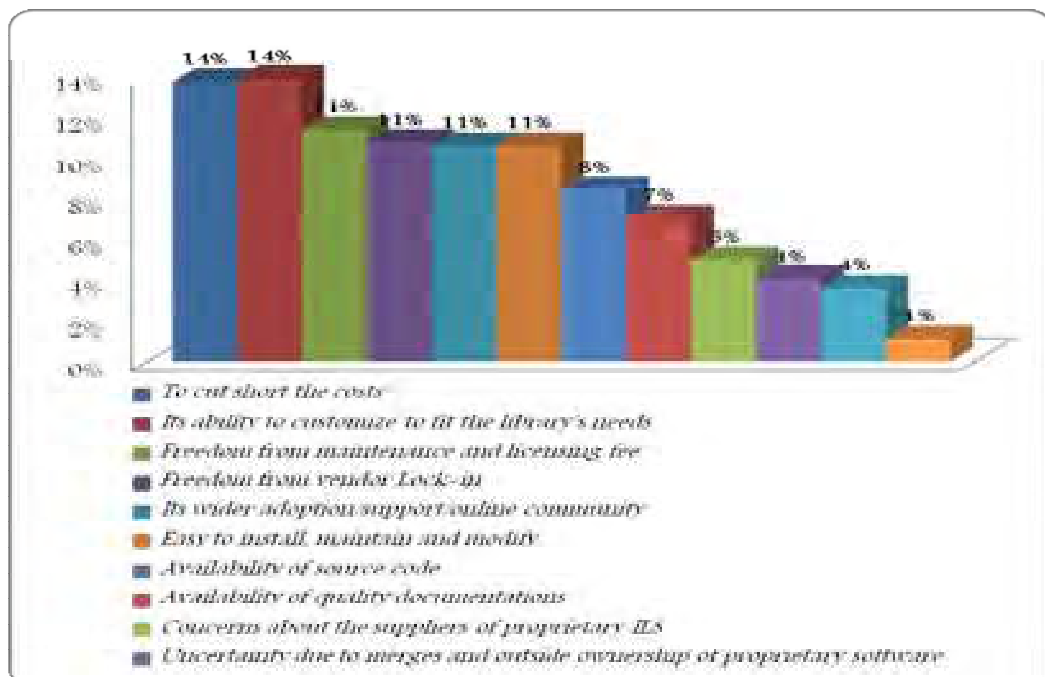
### 6.6.2. Reasons for Choosing OSILS

The respondents were asked to select the reasons for choosing or the factors which influenced in selection of open source ILS for their libraries and the following choices were given.

- To cut [short] the costs
- To become part of the consortium
- Its ability to customize to fit the library's needs
- Its wider adoption/support/online community
- Availability of source code
- Easy to install, maintain and modify
- Freedom from maintenance and licensing fee

- Freedom from vendor lock-in
- Uncertainty due to mergers and outside ownership of proprietary software
- Concerns about the suppliers of proprietary ILS
- Availability of quality documentations
- Other

From the responses received, the majority at equal rate (14%) indicated that they have chosen OSILS to reduce the cost of adopting library automation software and the ability of OSILS to customize to fit the needs of the library. Other concerns that were of great importance and equally represented (11%) in the means of selection of OSILS were freedom from maintenance and licensing fee, freedom from vendor lock-in and easy to install, maintain and modify the software and the wider support and availability of online community. Availability of source code, quality documentations and the concerns about the supplier of proprietary ILS were the other issues represented as 8%, 7%, 5% respectively. Uncertainty due to mergers and outside ownership of proprietary software and the library's decision to become part of the consortium equally (4%) prompted some responded libraries to go for OSILS. Analysis is graphically represented in Figure 6.34.



**Figure 6.34: Reasons for Choosing OSILS**

The above figure shows that different libraries are attracted to different OSILS for different reasons. Out of the total responses received, to cut short the costs and the ability of OSILS to customize to fit the library's needs were the two prominent reasons that attracted libraries to choose OSILS for their libraries. Interestingly, the wider adoption/support/online community of OSILS and the availability of source code in OSILS along with ease in installing, maintaining and modifying the software have also goaded many libraries to shift to OSILS. Freedom from vendor lock and availability of source code along with quality of documentation drove some libraries to adopt OSILS. The factors considered as least important in the selection process were uncertainty on proprietary software due to company mergers and outside ownership, concerns about the suppliers of proprietary ILS and the availability of quality documentation.

### **6.6.3. Experience on Functional Modules**

The results of the research revealed that majority of the respondents were familiar with the major system modules of the software they are using. Respondents were queried on their experiences with individual modules. OSILS can now manage most library operations efficiently. The OPAC and circulation modules of OSILS seem to be more efficient with 48% of participating libraries considering it excellent. Cataloguing module (46%) and Patron's details module (37%), a cognitive task of managing records of both the collection and user's details has also gained popularity among modules of OSILS. Creating original catalogue records or extracting records through copy catalogue is fully supported by most of the OSILS. The use of software generated reports is comparatively less in Indian libraries which may be due to the difference between the format available and requirement. Hence, the present survey reveals that 22% professionals consider report generation in OSILS as excellent and this is followed by 27% (Very Good and Good each), 15% (Fair) (Table 6.4). It is seen that generally, in Indian libraries records of serials and stock verification are manually maintained although the software provides devoted modules to perform the task. Among the modules which respondents have never experienced, these modules have the highest non exposure i.e. 13% and 18% respectively.

**Table 6.4: Respondents of OSILS Experience on Functional Modules**

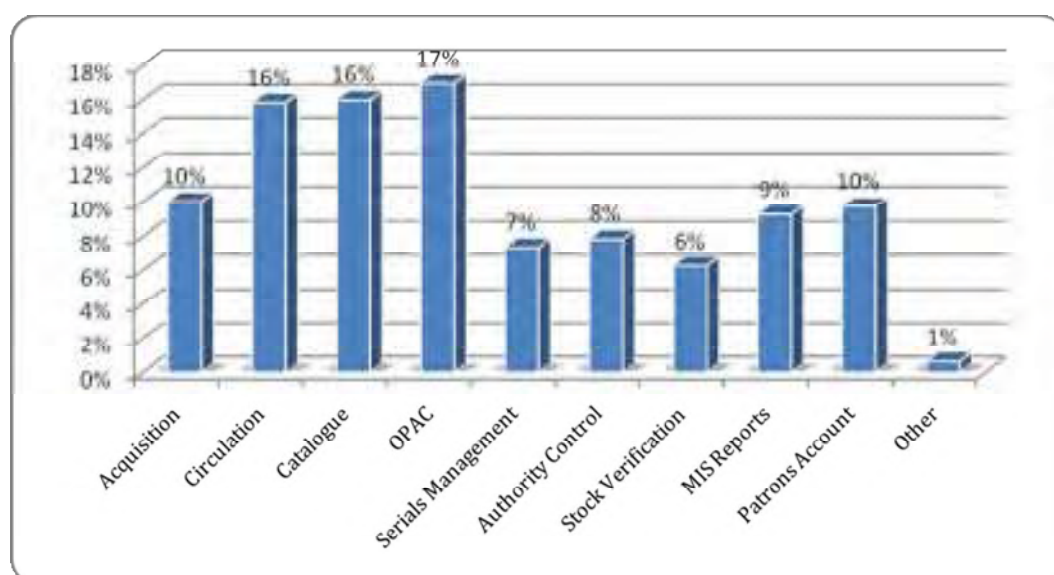
Modules	Excellent	Very Good	Good	Fair	Poor	Very Poor	Never Experienced
Acquisition	18.80%	36.09%	26.32%	6.77%	3.01%	0.75%	8.27%
Cataloguing	45.86%	33.83%	15.79%	3.01%	0.00%	0.00%	1.50%
Circulation	48.87%	30.83%	14.29%	2.26%	1.50%	0.00%	2.26%
Serials Management	15.04%	19.55%	28.57%	17.29%	4.51%	1.50%	13.53%
Statistical Reports	22.56%	27.07%	27.82%	15.79%	1.50%	1.50%	3.76%
Patrons Details	36.84%	36.84%	13.53%	9.02%	0.00%	1.50%	2.26%
OPAC	48.12%	32.33%	15.79%	1.50%	1.50%	0.00%	0.75%
System Administration	30.83%	33.08%	28.57%	3.01%	0.75%	0.00%	3.76%
Stock Verification	12.78%	21.05%	30.08%	14.29%	3.76%	0.00%	18.05%

Despite of the challenges and difficulties, respondents have a positive experience in general on all the functional modules of the software that they are using. Moreover, the rate of Poor and Very Poor are significantly less which is evidence that OSILS modules are appreciated.



#### 6.6.4.Functional Modules of OSILS over Commercial ILS

The survey asked the respondents to rate the functional modules of OSILS in comparison with the commercial ILS. From the analysis it was observed that OPAC module has the higher advantage (17%) compared to its commercial counterpart. Ratings for other modules are; modules for circulation and catalogue (16%) and acquisition and patrons details (10%), modules for MIS reports, authority control and serials management were 9%, 8% and 7% respectively. Figure 6.35 graphically represents the analysis.



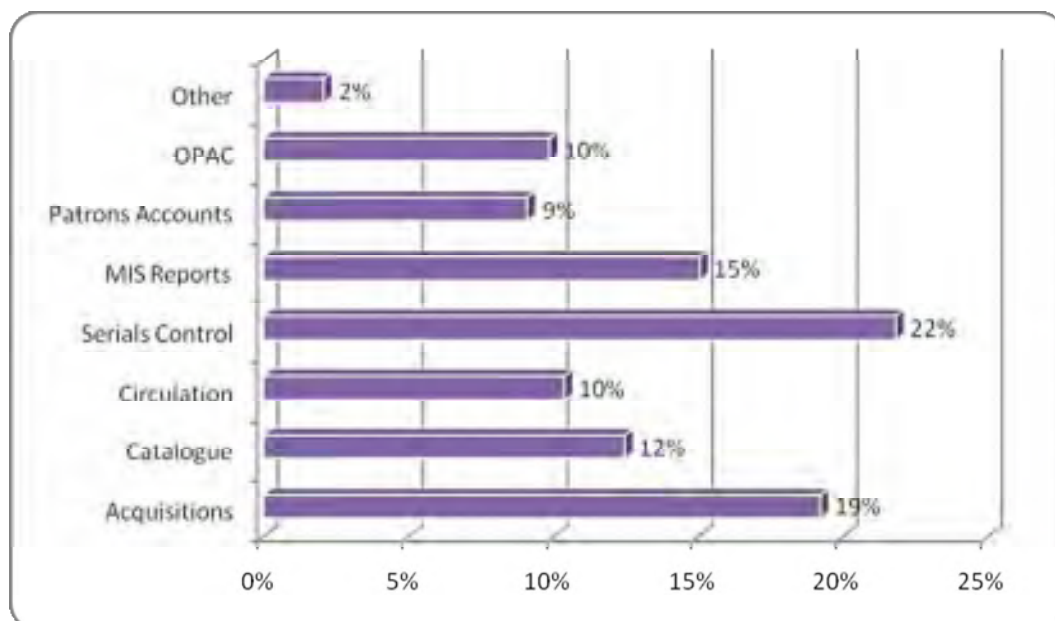
**Figure 6.35: Comparisons of Functional Modules of OSILS over Commercial ILS**

It is clear from the analysis that in comparison to commercial software the module for OPAC, Circulation and Cataloguing in OSILS are perceived as more efficient. Analysis also indicates that modules for serials management, authority control, stock verification and MIS reports are comparatively not well fixed and needs to be customized in order to compete with their commercial counterparts.

#### 6.6.5.Need for Customization

Questions were also asked to identify whether the respondents require customization in the existing software to meet their user's specific needs. The ability of the software to accommodate new features to their individual installations is one of the

major reasons for library professionals to choose OSILS as their automation software. The respondents were asked to indicate the need for customization in the major modules and majority of them sought customization on Serial Control (22%) and Acquisition (19%) modules of the software. Some of the respondents (10%) agreed that the design of the OPAC and Circulation module of the software they were using was not as streamlined as it could be. Figure 6.36 graphically depicts the analysis.



**Figure 6.36: Need for Customization of Modules of OSILS**

Customization of the software can be difficult if the library does not have a person with technical expertise in the software or if there is no community support. The experience of customizing the software may differ substantially from person to person. The analysis show that modules for serials control and acquisitions in OSILS requires a high degree of customization to make it fit to perform the functions where-as module for registering patron's details can be well performed with the existing options in the OSILS.

#### **6.6.6.Efficiency of Current OSILS Used**

Most of the OSILS users were in favour of adopting OSILS and have strongly agreed with the efficiency of the software as compared to its commercial opponent. Apart from the basic functions and features of the software, users were asked to rate their level of satisfaction with selected advanced features such as installation of the software,

maintenance of database and backups, features and functionalities of modules, customizations and integrations, housekeeping operations, report generations, technical and community supports, availability of documentation, responses of the users, upgrades and enhancements, design and coordination of statistical reports and managing print and electronic resources.

Respondents were asked to indicate their level of satisfaction with OSILS with a set of activities to determine the efficiency of the software. Majority of the respondents (46%) marked efficiency of the OSILS as Very Good with reference to features and functionalities of all the modules. Comparatively higher percentages (44%) of respondents agreed that the upgrades and enhancements features of OSILS were 'very good' followed by Database Maintenance and Backups (35%), Features and Functionalities of Modules (34%), Design and Coordination of Statistical Reports (33%). Respondents gave same rating as very good for the features such as housekeeping and report generation. The rating for upgrades and enhancements was 32% and 23% for technical/community support and documentation. However, the overall responses of the users on all the advanced features of OSILS were highly satisfactory. Analysis is represented in tabular format in Table 6.5.

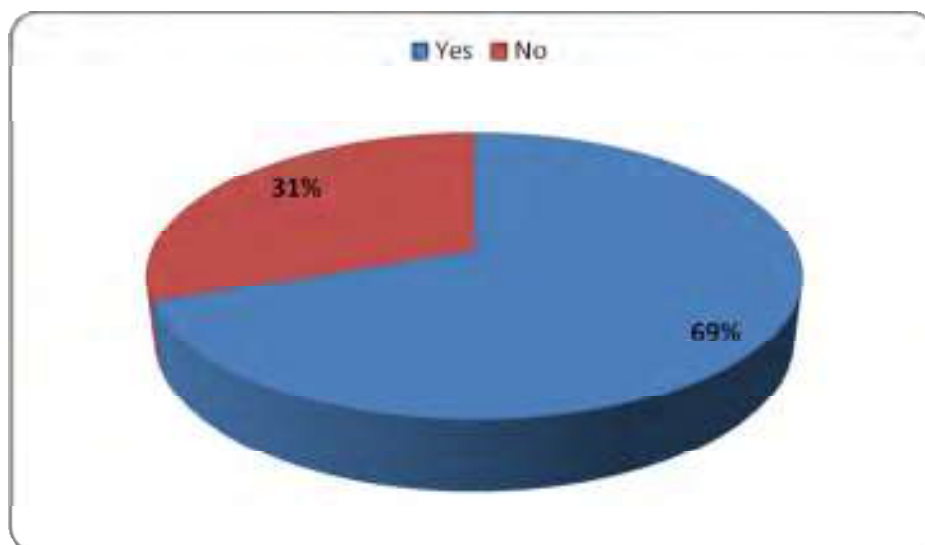
The study reveals that majority of the libraries in India using OSILS were highly satisfied with the advanced features contributing to the efficiency of the software. The characteristic features such as customizations and integrations, database maintenance and backups and features and functionalities of modules were highly appreciated by the respondents.

#### **6.6.7. Training Program**

Libraries of all types using any OSILS were asked to mention their attendance on any training program in their software. Most of the respondents (71%), have under-gone some kind of training program to make themselves more independent and self-sufficient to manage the software. Analysis is diagrammatically represented in Figure 6.37.

**Table 6.5: Efficiency of OSILS Being Used**

Characteristics	Excellent	Very Good	Good	Fair	Poor	Very Poor	Never Experienced
Database Maintenance and Backups	30%	35%	24%	5%	2%	0%	5%
Features and Functionalities of Modules	29%	34%	26%	5%	2%	0%	4%
Customizations and Integrations	20%	44%	24%	7%	3%	0%	2%
House Keeping and Report Generation	16%	32%	37%	9%	4%	0%	2%
Technical/Community Support	22%	23%	37%	11%	3%	2%	2%
Documentation	21%	23%	29%	19%	4%	0%	4%
User's Response	23%	25%	33%	14%	4%	0%	2%
Upgrades and Enhancements	17%	32%	36%	11%	2%	0%	3%
Design and Coordination of Statistical Reports	20%	33%	28%	11%	3%	0%	5%
Managing Print Resources	16%	20%	40%	17%	3%	0%	4%
Managing Electronic Resources	20%	28%	35%	11%	5%	0%	3%



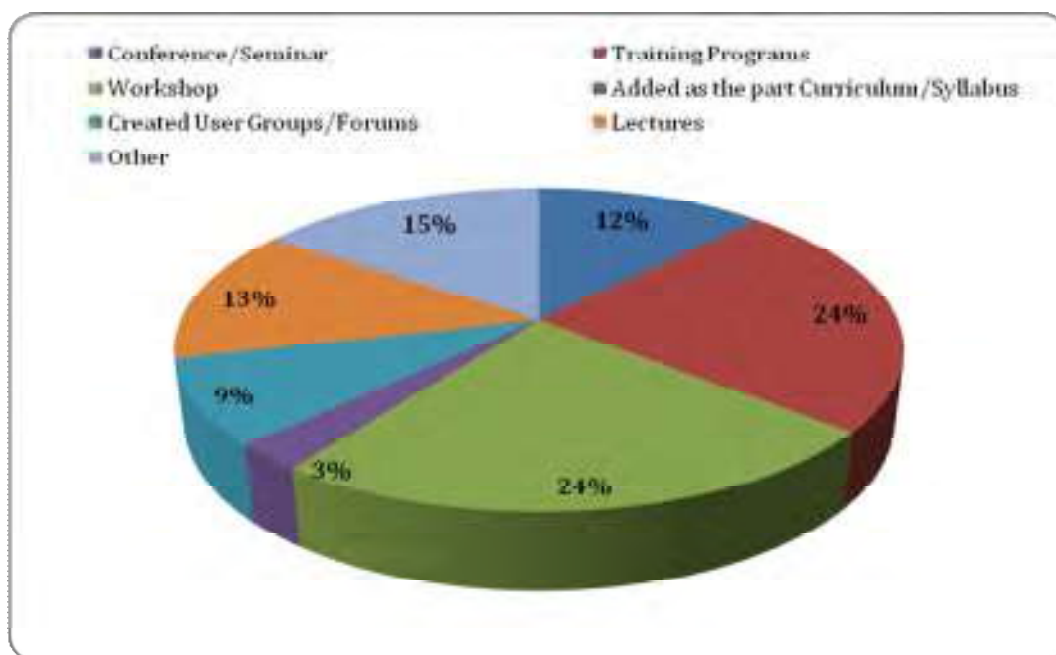
**Figure 6.37: Training Programs Attended on OSILS**

It is a prerequisite for any library who wish to adopt OSILS to make their library staff undergo extensive training. The quantum of training undergone by the library professionals is encouraging and the analysis revealed that quite a number of library professionals who underwent training in India have shown great interest in OSILS adoption. Such learning programs will reduce the fear of taking risk on OSILS and empowers the professionals to become self-sufficient to adopt OSILS instead of always relying on commercial vendors for installation and implementation.

#### **6.6.8. Activities on OSILS**

Respondents were also asked to indicate the effort they made to enhance the awareness and improve the perception of OSILS among library professionals in India. Many of the respondent libraries reported that they organized some kind of programs to promote the use of OSILS. Of these libraries, an equal (24%) percentage of respondents have organized training programs and workshops on OSILS. 15% organized other programs apart from organizing conferences, seminars, training programs, workshops, lectures, creation of user groups and forums and adding OSILS as part of curriculum or syllabus. Further 14% arranged lectures and 12% organized conferences and seminars to market the software. Few respondents (9%) had created online user groups and forum and some (3%) have added OSILS as part of their curriculum to promote the use of OSILS.

However, some libraries offered internal classes for their own staff members to make them understand the software and others incorporated the software details in their website, blog, wikis etc in electronic form as a promotional measure. Figure 6.38 diagrammatically depicts the analysis.



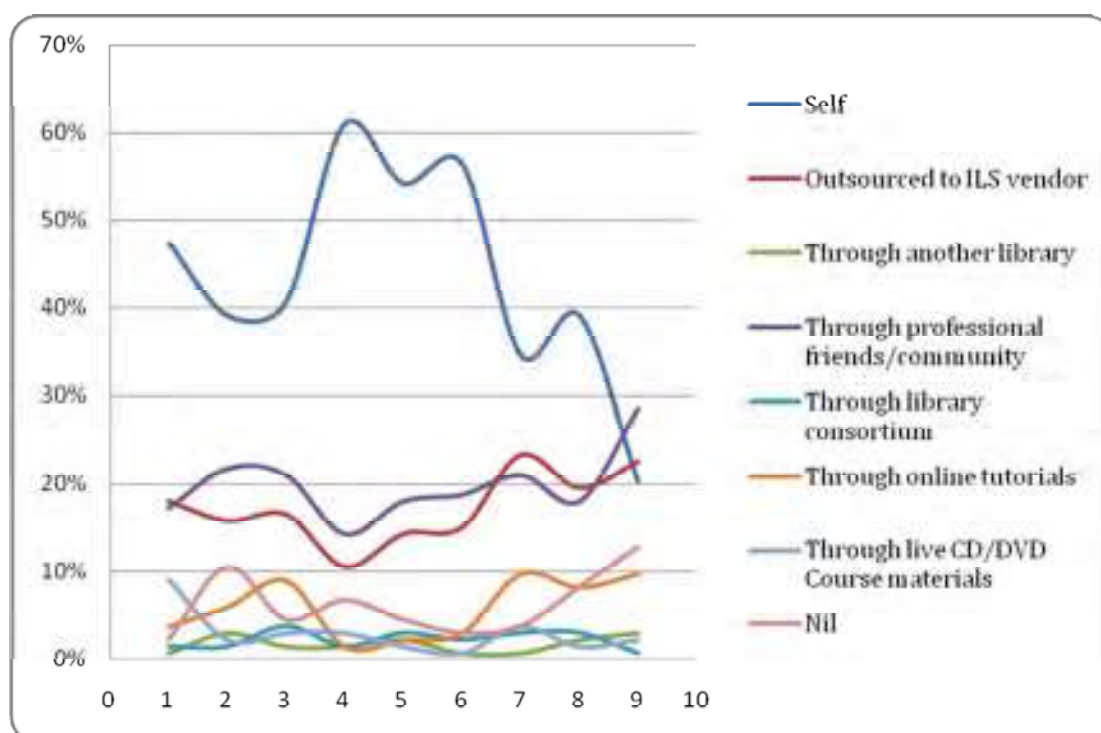
**Figure 6.38: Promotional Activities on OSILS**

Provision for training on OSILS is one of the major concerns associated with the adoption of OSILS. Study indicates that there is an expansion of the number of workshops, training programs, conferences, seminars and creation of user groups and forums to promote awareness on OSILS in Indian libraries, which motivates the professionals to adopt or migrate to OSILS. However intensive training programs for both the library professionals and the users' needs to be conducted.

#### **6.6.9.Implementation Process**

Some respondents agreed that they lack technical expertise to do implementation process and so they are forced to hire paid technical support. However, up to some extent the collaborative approach can solve the issue of technical support. There are professionals and firms providing technical support at minimal cost. The implementation of OSILS could be determined considering the parent institution's skilled manpower, IT infrastructure, motivation and continuous support. Implementing an OSILS indirectly creates

opportunities for library professionals and in-house technical personnel to explore and contribute to the development process. In this research study, it is clear that 47% of the respondents managed to self install OSILS in their libraries. In areas which require technical knowledge such as maintenance (56%), hosting (54%), configuration (41%), customization (39%) and adding new features (35%) libraries are managing the process by themselves to a great extent. 61% of libraries train their staff for the software by themselves where as for Bug fixing, 29% of the libraries found ways to resolve the issues through professional friends and community. Some respondents have referred the processes followed by other libraries to perform implementation. A few used demonstration videos or available literature to learn the process. Overall, respondents have agreed that they were self sufficient in running OSILS from its installation to maintenance and customization. Figure 6.39 depicts the graphical representation of the analysis done.



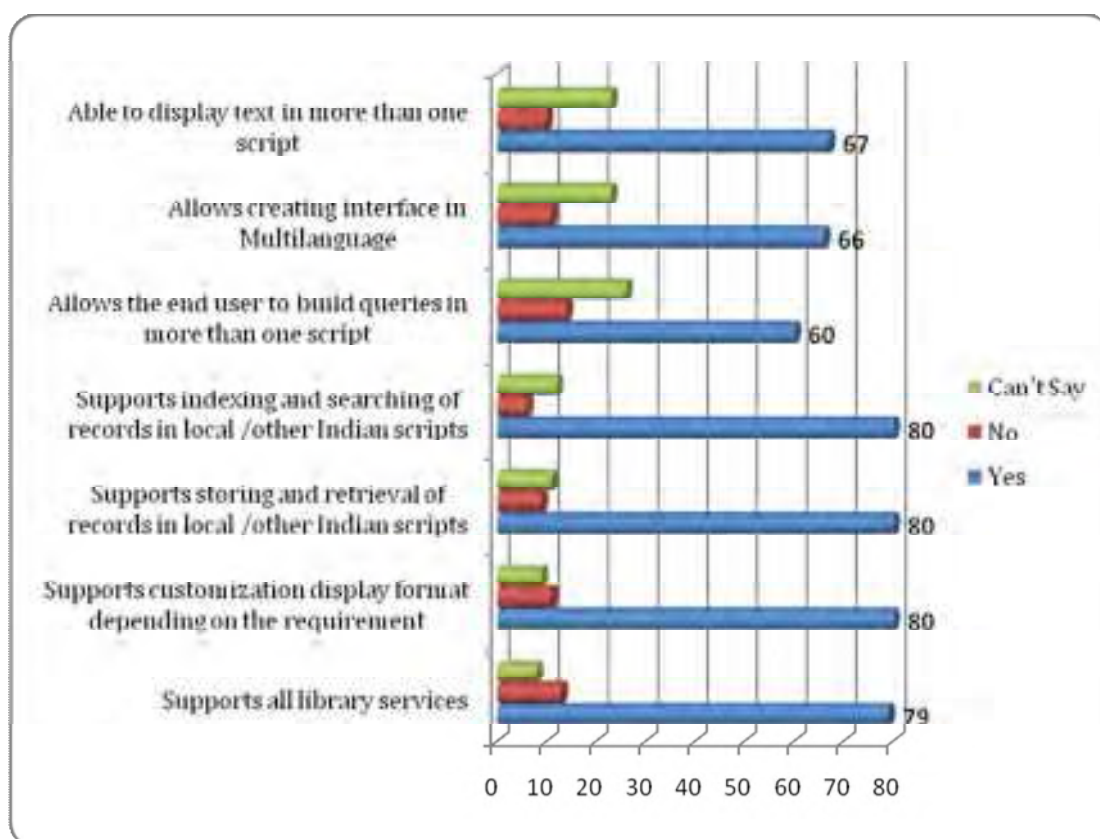
**Figure 6.39: Managing Implementation Process of OSILS**

Even if there is an outside agency for implementation, training is essential for the library professional to make better use of the software and to be confident and independent. It is vital for library professionals to learn OSS related skills, implementation and customization skills as these can substantially reduce the cost of hiring external expert.

Availability of online training materials and demonstrations prepared by other libraries based on their experiences helps professionals to learn through self-study. However analysis shows that staff with certain amount of technical expertise within the library can routinely perform support, implementation and basic maintenance of the software.

#### 6.6.10. Views on OSILS

Participants of the survey were asked about their views on some selected key features associated with OSILS. An overwhelming majority had a positive approach on all the statements such as OSILS supports- all library services (81%), customization display format depending on the requirement (86%), storing and retrieval of records in local /other Indian scripts (86%), indexing and searching of records in local /other Indian scripts (83%), end user to build queries in more than one script (64%), creating interface in Multilanguage (71%) and displaying text in more than one script (72%) respectively. Analysis is represented graphically represented in Figure 6.40.



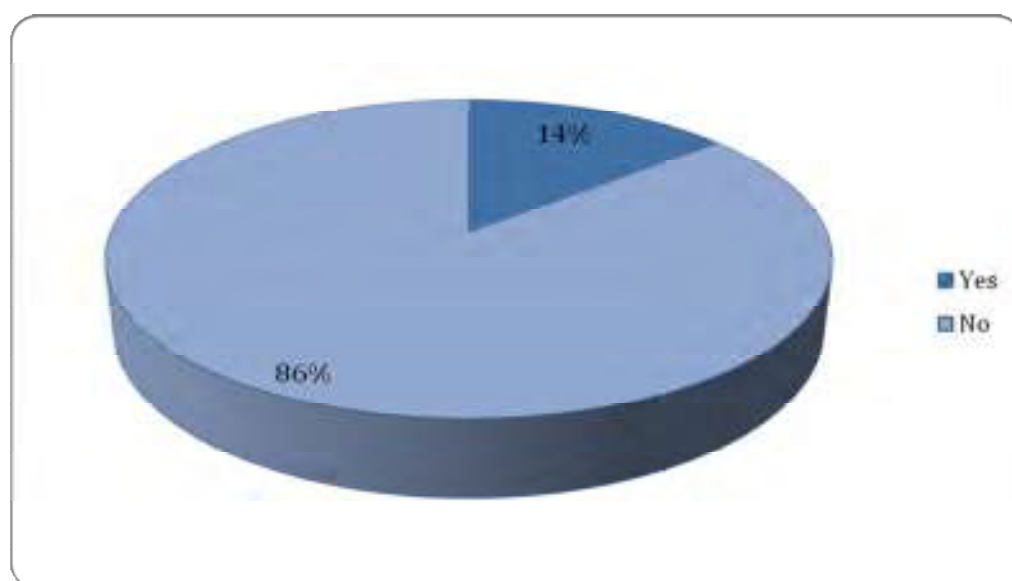
**Figure 6.40: Views on OSILS**



The result of a survey indicates the positive perceptions of libraries toward their automation using OSILS. Storing and retrieving, searching, displaying, sorting and indexing are highly influenced in a system as far the language support of the software is concerned. Multilanguage support of an OSILS can be indicated in many modes such as recording of bibliographic details in more than one language, display of system interface in more than one language, display of text from a database in more than one script, building of queries in more than one script etc. These features of software are crucial for localization also.

#### **6.6.11. Intention to Switch Over to Commercial ILS**

Users of OSILS also were questioned about their views on adopting commercial software by exiting from the OSILS being used. 86% of the respondents were not interested in switching over to a commercial one. However, a few respondents (14%) have shown their interest in adopting commercial ILS. Diagrammatic representation is shown in Figure 6.41.

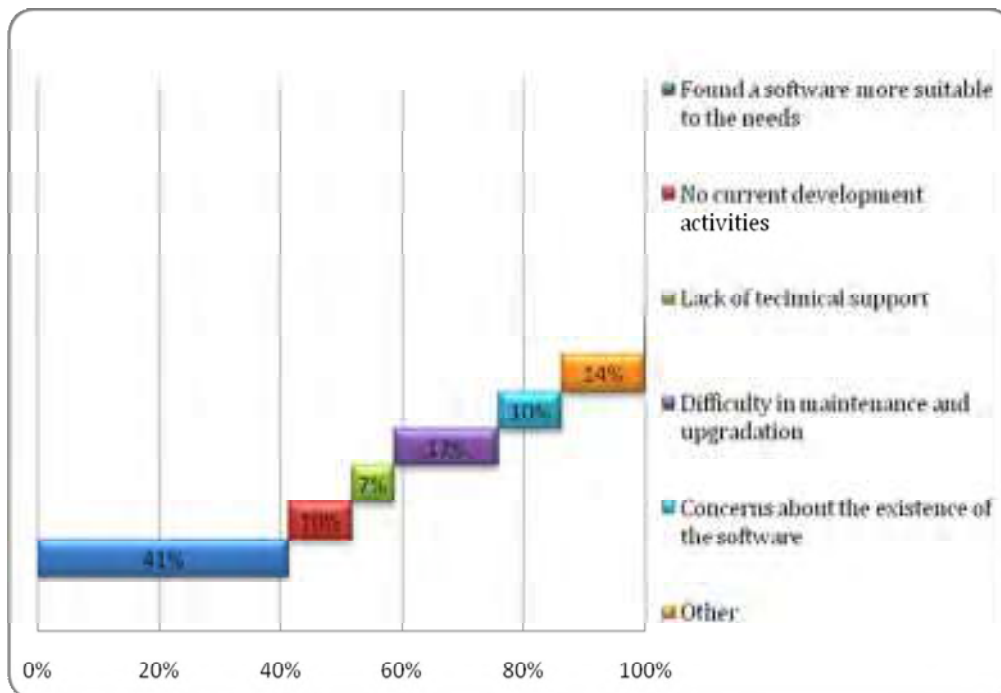


**Figure 6.41: Intention to Switch Over to Commercial ILS**

The majority of OSILS users expressing their interest in continuing with OSILS shows that once the advantages and functionalities are realized, then the chance of switching over from OSILS to commercial ILS is very low.

### 6.6.12. Reasons to Migrate to ILS

When queried about the reasons why respondents wanted to migrate to another ILS, it was seen that majority of the respondents were not satisfied with the existing software and they found some other software more suited to their requirement. Among the total respondents who had plans to migrate to commercial ILS from OSILS a higher majority (41%) found a software more suitable to their needs and 17% had faced difficulty in maintaining and upgrading it. Around 10% respondents were planning to switch over to commercial ILS as they face lack of current development activities with the software and equal number were concerned about the continued existence of the software. A few respondents (7%) planned to migrate to commercial ILS due to lack of technical support. Analysis is diagrammatically represented in Figure 6.42.



**Figure 6.42 Reasons to Migrate to OSILS**

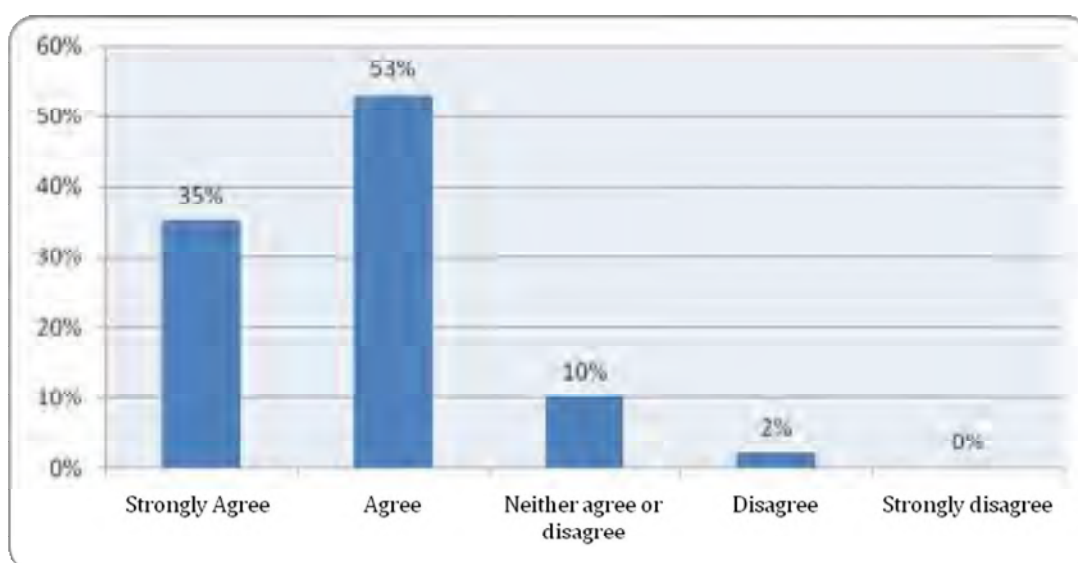
The examination on why OSILS users are planning to switch over to costly commercial ILS reveals problems such as difficulty in maintenance and up-gradations, lack of technical support from the vendors and the lack of current development activities of the existing software. Some respondents voiced their dissatisfaction with their legacy ILS due to the concerns about the continued existence of the software.

### 6.6.13. Assumptions and Misconceptions on OSILS

The research study also examined the opinions of library professionals on some of the commonly discussed assumptions and misconceptions which encourage or discourage the adoption of OSILS. Respondents were asked to indicate their level of agreement with some selected statements on OSILS to explore their views towards its adoption in Indian libraries and to compare the advantages of OSILS versus commercial ILS. The professionals shared their views on each statement and the responses to each statement were recorded as Strongly Disagree, Disagree, Neither agree or disagree, Agree and Strongly Agree. The descriptive statistics of the analysis indicated that the respondents either strongly agreed or agreed with all the statements that favours the adoption of OSILS. Following were the statements.

#### Libraries Switching to OSILS

The respondents were asked to indicate their opinion on the statement “more libraries in India are switching to OSILS”. Majority of the respondents (53%) agreed to the statement and 35% of the respondents strongly agreed to the statement. A few respondents (10%) indicated that they neither agree or disagree and 2% stated that they disagree that in India more libraries are switching over to OSILS. Graphical representation of the analysis is shown on Figure 6.43.

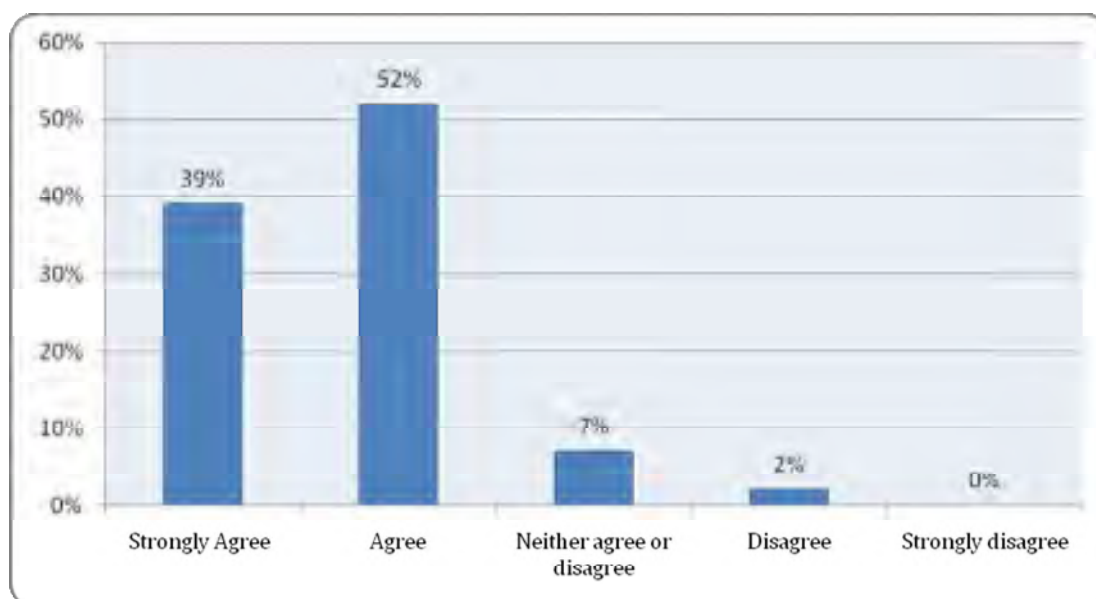


**Figure 6.43: Level of Agreement on Switching to OSILS**

It can be concluded from the above analysis that more libraries in India are switching over to OSILS as majority of the respondents either agree or strongly agree with the statement. The study revealed a continued interest among the library professionals to adopt OSILS. However, though the progression in the adoption rate of OSILS in Indian libraries is encouraging, it is far from satisfactory.

### OSILS in Academic Curriculum

Respondents were also asked to indicate the importance of including chapters on the application of OSILS in the academic curriculum to make the coming generation aware of the advantages of OSILS. It was found that 52 percent agreed with the statement while 39 percent strongly agreed. Just 7% of the respondents neither agree or disagree with the statement and the percentage of disagreement was negligible (2%). Figure 6.44 shows the graphical representation of the analysis.



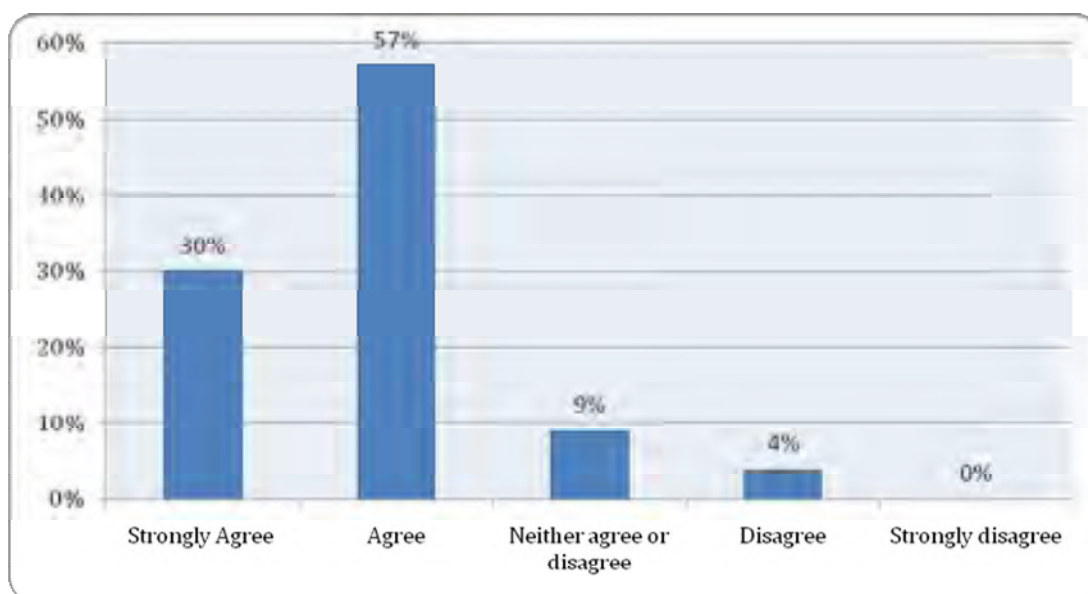
**Figure 6.44: Level of Agreement on OSILS to be Part of Curriculum**

The analysis indicates the importance of incorporating the subject of OSILS in the academic curriculum. The curriculum developers have to revise the curriculum and significant emphasize needs to be given to keep pace with the emerging technologies and student groomed to take up the challenges of emerging technology applications. There are just a few universities and institutions around the country who are starting to include OSILS applications in the curriculum. Pondichery University in their syllabus

for the practical courses of MLIS programme includes ILSs such as KOHA, WINISIS, LIBSYS, and SOUL and Digital library software like Greenstone, Dspace and E-prints. Similarly, North Eastern Hill University, Meghalaya has also included OSILS in their curriculum.

### **Support for OSILS from Professional Organizations and Government**

The survey asked the respondents to state their level of agreement with the statement “Support on OSILS has increased from both Library professional organizations and Government”. More than half (57%) of the respondents agreed with the statement and 30% strongly agreed. Just a small percent (9%) neither agreed nor disagrees and 4% disagreed with the statement. The analysis is graphically depicted in Figure 6.45.

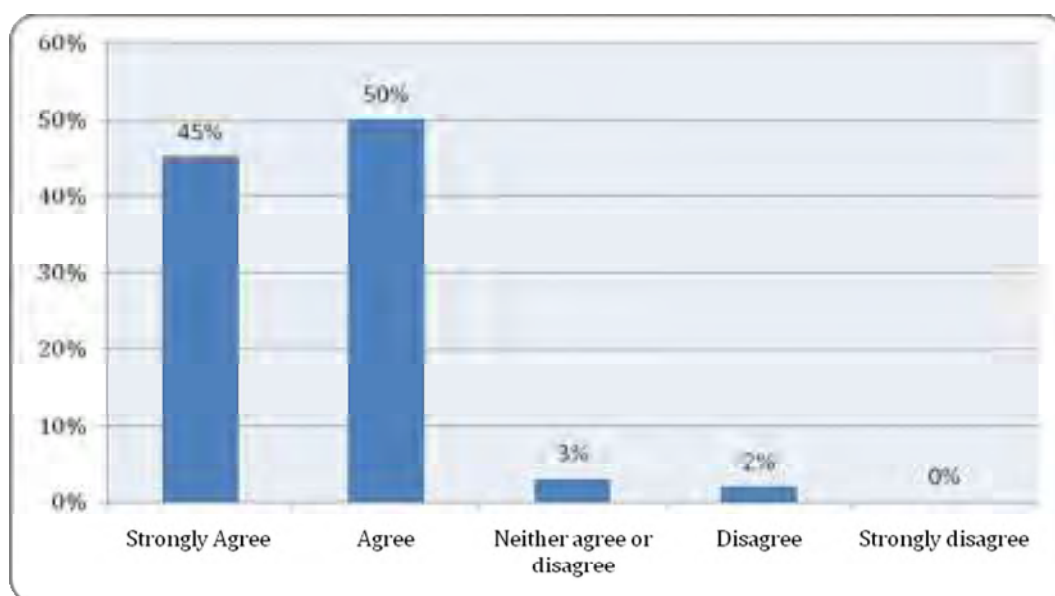


**Figure 6.45: Level of Agreement on OSILS Support**

It is clear from the response rate that majority of the respondents confirmed that support on OSILS from both Library professional organizations and Government has increased. As a shining example, Kerala government has recently declared Koha, an OSILS to be a recognized OSILS, that is also considered for the automation of all government libraries in Kerala, surely a milestone in the history of OSILS in India. Moreover, the Government of India, in order to support the policy to adopt open standards for procurement, has further moved to adopt a comprehensive and supportive open source policy especially for e-governance and other initiatives as part of Digital India project.

## Training Programs and Workshop

Responses were sought to collect the level of agreement with the importance of conducting workshops and training programs by the library fraternity to enhance the adoption of OSILS in Indian libraries. It was found that 50% of the respondents agreed and 45% strongly agreed with the statement. The percentage of those who disagree and neither agree or disagree were insignificant. Figure 6.46 represents the graphical outline of the analysis.



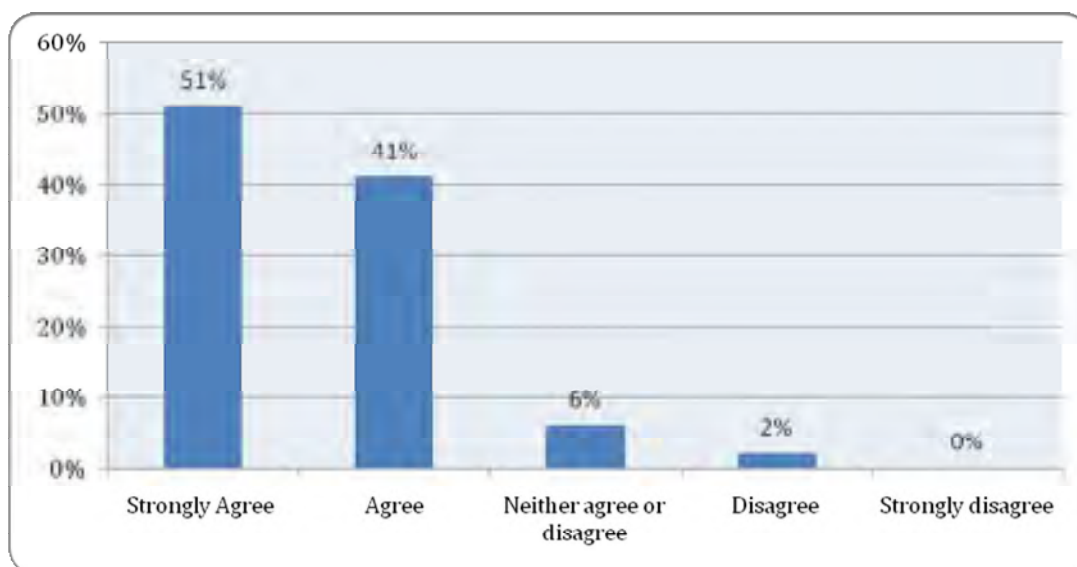
**Figure 6.46: Level of Agreement on Need for Promotional Activities**

It is clear that organizing training sessions, workshops, lecture programs etc. will keep more professionals involved in OSILS use and will help them to retain more information on advantages and applications of OSILS. These programs can be considered as marketing tools and can attract more participants if the service is completely free. Conducting training programs, awareness programs, adoption programs etc. enable other professionals to enhance their understanding and there by encourages libraries in adopting OSILS.

## Free Awareness and Training Programs on OSILS

Against the statement "Library professionals should have more opportunity to attend free awareness and training programs on OSILS" more than half (51%) of the total

respondents strongly agreed and 41% also agreed that they should have opportunity for getting a platform to refresh their knowledge on OSILS. Just few respondents (6%) neither agreed or disagreed and a mere 2% respondents completely disagreed with the statement. The graphical representation for the analysis is made in Figure 6.47.

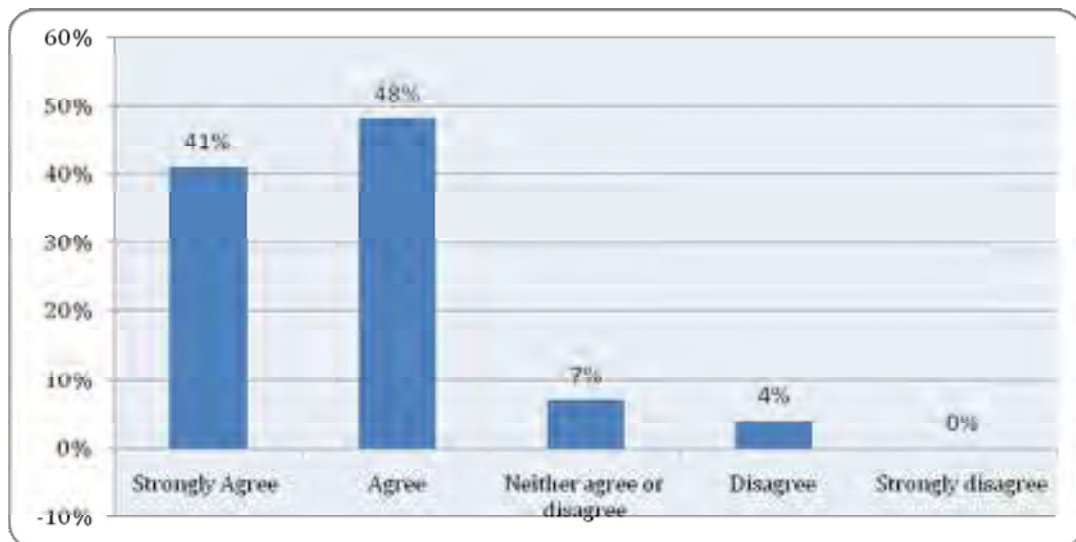


**Figure 6.47: Level of Agreement on Professionals Opportunities**

Awareness and training programmes for users, both patrons and library staff on use of OSILS need to be provided free of cost. Such free training programs will attract more professionals to participate to gain or refresh their knowledge on OSILS. At present training programs are available from NISCAIR, INFLIBNET which is very expensive and unless funded by the organization, it is unaffordable. Workshops, training programs etc. organized by associations and professional bodies should also be able to provide the services at less financial costs. Further, the effectiveness of these programs in encouraging more libraries to adopt OSILS needs to be evaluated.

### **Quality Documentation in Public Domain**

The respondents stated their level of agreement with the statement "High quality documentation on OSILS should be available on the public domain" with 41%, 48%, 7% and 4% as strongly agree, agree, neither agree or disagree and disagree respectively. The analysis is graphically depicted in Figure 6.48.



**Figure 6.48: Level of Agreement on Need for Documentation**

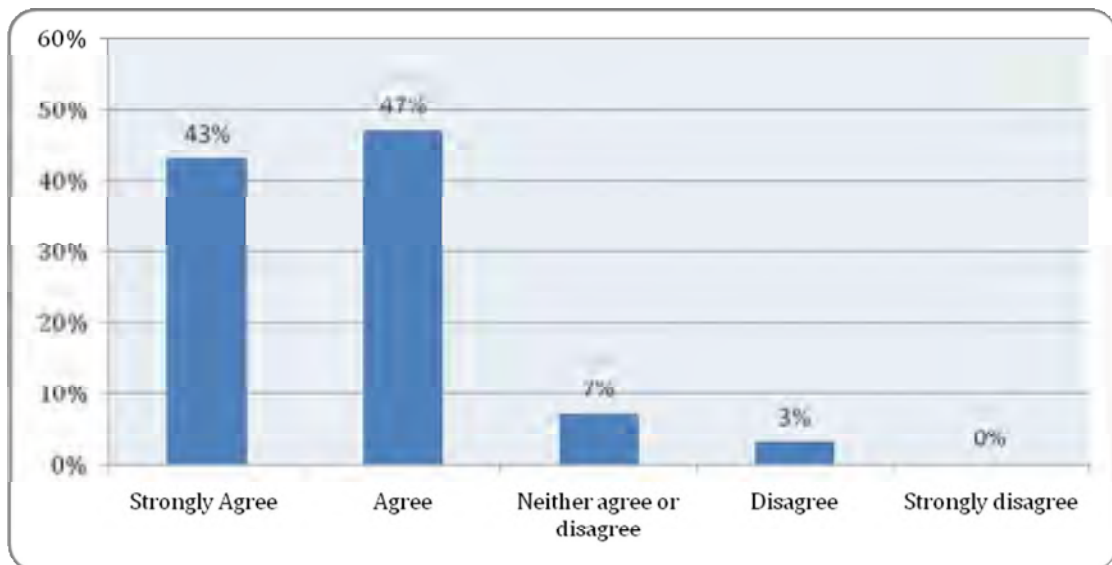
Availability of quality documentation either online or in printed format assists professionals using and working on particular software. Documents explaining solution for specific issues or problems helps professionals to easily adopt or migrate. Adequate documentation for both users and administrators are required to be created, as this is one of key issues to be considered in automation software selection.

### **Economical and Technological Benefits**

Respondents were asked to indicate their level of response on the statement "OSILS provide significant economical and technological benefits" and higher majority of the respondents either agreed (47%) or strongly agreed (43%) that OSILS is a cost effective solution. Few respondents neither agreed or disagreed (7%) and (3%) disagreed with the statement. The analysis is graphically represented in Figure 6.49.

OSILS is a solution that considerably reduces the cost associated with its adoption unlike commercial packages. Scalability for growth, flexibility to expand and user-controlled customization in administrative and user interface etc. help users to easily adopt the software for their libraries. OSILS is the result of collaborative effort that is frequently reviewed and most of the features are regularly updated, compared to other popular proprietary software packages, whose in built features reduces its further customization by individuals.

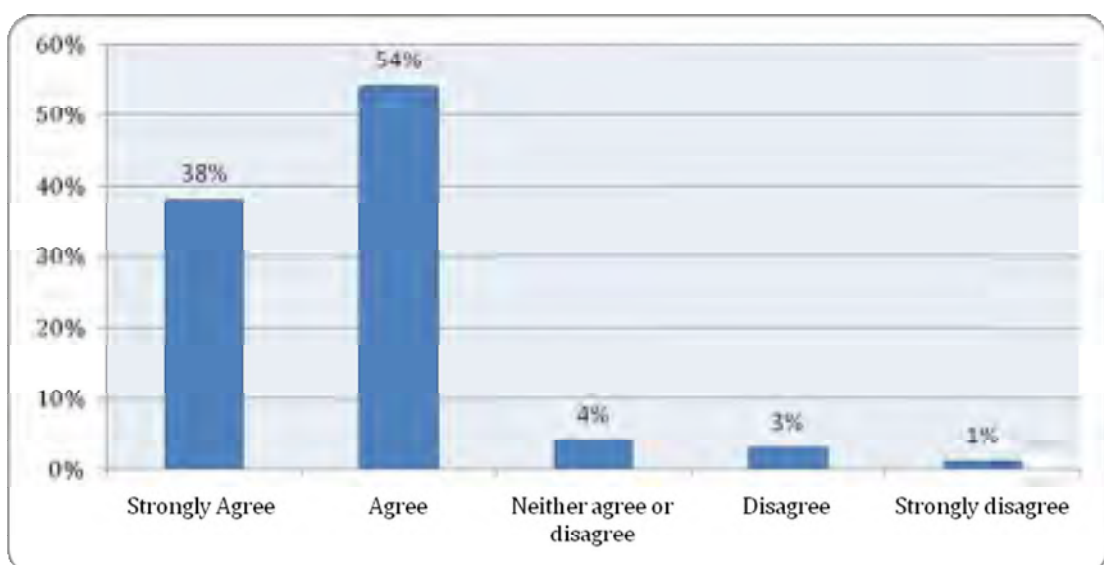




**Figure 6.49: Level of Agreement on Benefits of OSILS**

### **OSILS Leads to Innovations and Collaboration**

Respondents were asked to mark their level of agreement with the statement "Application of OSILS in libraries leads to greater innovations and collaboration among the communities". It was found that more than half (54%) of the respondents agreed and good number of respondents (38%) strongly agreed with the statement. Less than 10% of the respondents disagreed or strongly disagreed while 4% neither agreed or disagreed with the statement. The analysis for the statement is graphically represented in Figure 6.50.

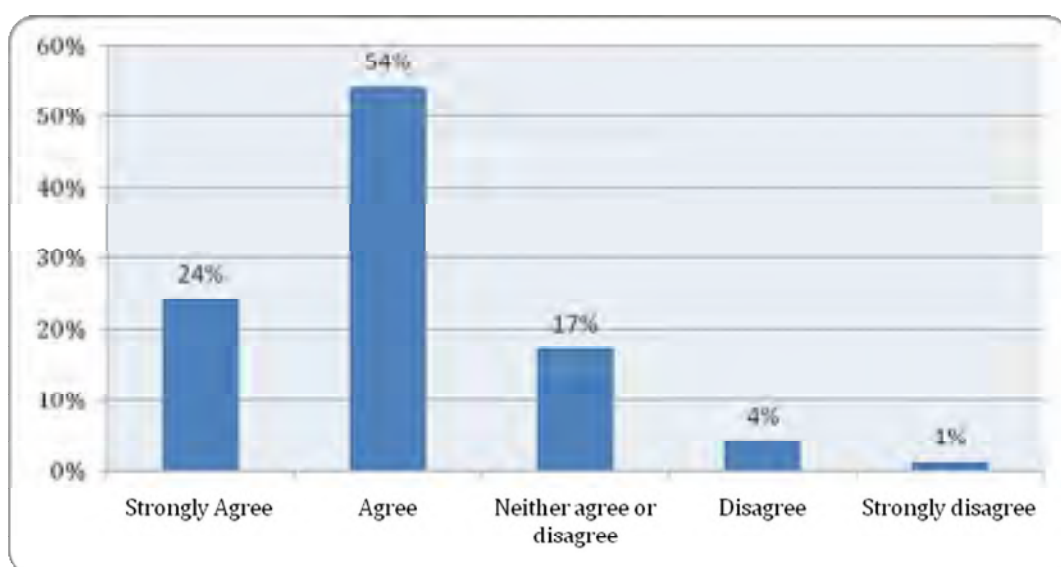


**Figure 6.50: Level of Agreement on Advantages of OSILS**

Public support and community participation to innovations in the area of knowledge-based product or service is one of the major factors to be considered in ensuring its long-term sustainability. The users of the software can make valuable contributions if they have right to do so. The collaborations and contributions can be in different ways such as writing documentation, writing or modifying the source code, debugging, providing training programs etc. which leads to collaboration among the communities.

### **Efficiency to Perform Value Added Services**

Respondents were asked on the impact of OSILS in libraries to increase the service offering on a five points scale and were answered in the sequence of 'strongly agree', 'agree', 'neither agree or disagree', 'disagree' and 'strongly disagree' at the rate of 24%, 54%, 17%, 4% and 1% respectively. Graphical representation in Figure 6.51 shows the analysis clearly.

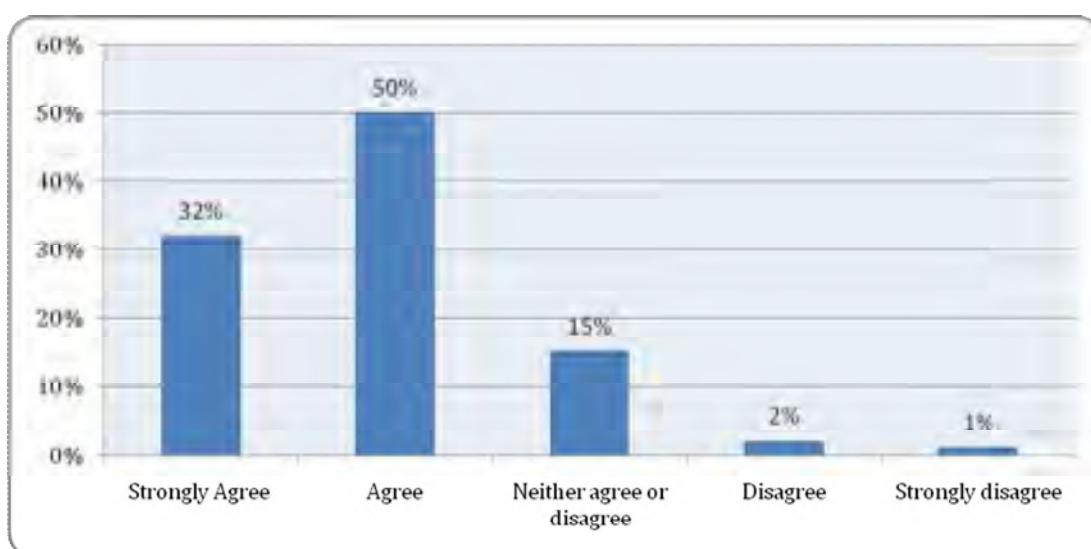


**Figure 6.51: Level of Agreement on Service of OSILS**

OSILS, enables users to customize or modify the functional needs according to local requirements and thereby facilitate completion of works in an organized way. Implementation of OSILS gives room for libraries to provide more efficient, effective and faster services to users.

### **OSILS Facilitates efficient Use of Resources Across the Country**

Respondents of the survey were also asked to indicate their level of agreement with the statement that application of OSILS facilitate efficient use of resources across the country. 50% of the respondents agreed with the statement and 32% strongly agreed. However, few respondents (15%) neither agreed or disagreed and very few disagreed and strongly disagreed at the rate of 2% and 1% respectively. Figure 6.52 graphically represent the analysis.

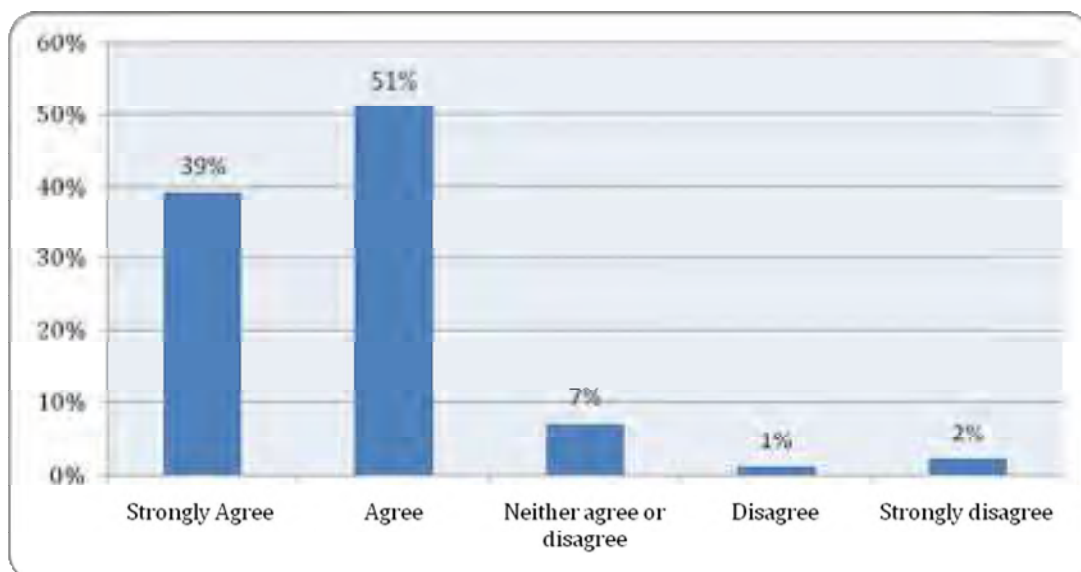


**Figure 6.52: Level of Agreement on Efficiency of OSILS**

OSILS are known for its efficiency and effectiveness in handling library holdings in different formats. Majority of the respondents expressed an interest in the application of OSILS in libraries to facilitate efficient use of resources across the country.

### **Better Choice for Libraries**

The survey also asked respondents to give their opinion on the statement “OSILS are better choice for libraries to adopt” and more than half of respondents (51%) agreed with 39% respondents strongly agreeing with the statement. Few had different opinions at the rate of 7%, 1% and 2% as neither agree or disagree, disagree and strongly disagree respectively. Figure 6.53 depicts graphical representation of the analysis.



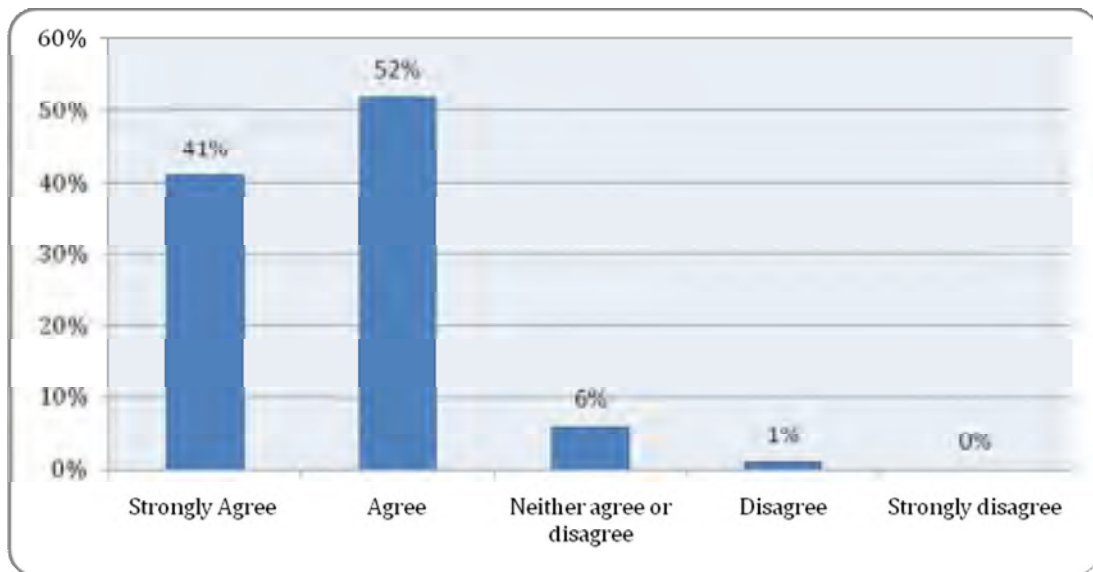
**Figure 6.53: Level of Agreement on Choice of ILS**

It is evident that more libraries in India are slowly adopting OSILS and there is potential for the software in India. Adoption of OSILS is a better choice for libraries facing budgetary constraints. Stability, larger installations, big communities, versatility and ongoing development, scale of development history, feasibility to meet all requirements, flexibility, cost effectiveness and availability of source code etc. are some of the major reasons that make the OSILS the choice of many institutions in India.

### **Enhances Technical Expertise and Develops New Skills**

41% and 52% respondents strongly agreed and agreed with the statement “OSILS enhances the technical and technological expertise of library professionals and develop new skills” respectively. The analysis is graphically represented in Figure 6.54.

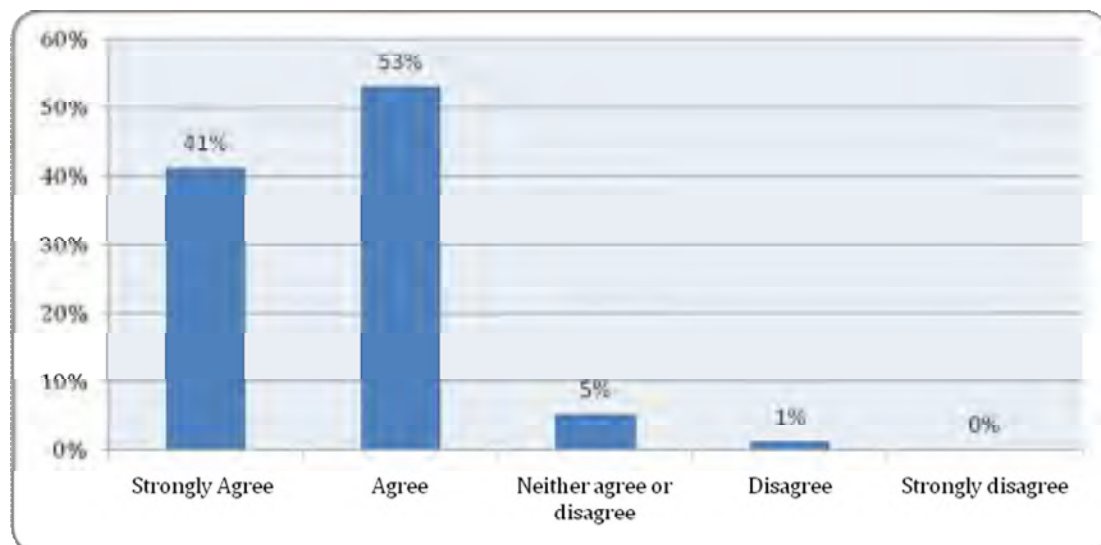
Implementation of OSILS is made easy due to the availability of support from other libraries, online communities and also from commercial vendors. However, in order to work with the software there is need to learn the technical and technological issues upto a minimum level at least. Professionals should be able to understand the features and facilities if they continuously use it and wish to work on the source code.



**Figure 6.54: Level of Agreement on Enhancement of Professional Expertise**

#### **OSILS Helps Sharing of Knowledge and Skills**

When the statement "Adoption of OSILS helps sharing of knowledge and skills" was given, the degree of agreement was 41% strongly agreed, 53% agreed, 5% neither agreed or disagreed and 1% disagreed. Graphical representation for the analysis is depicted on Figure 6.55.

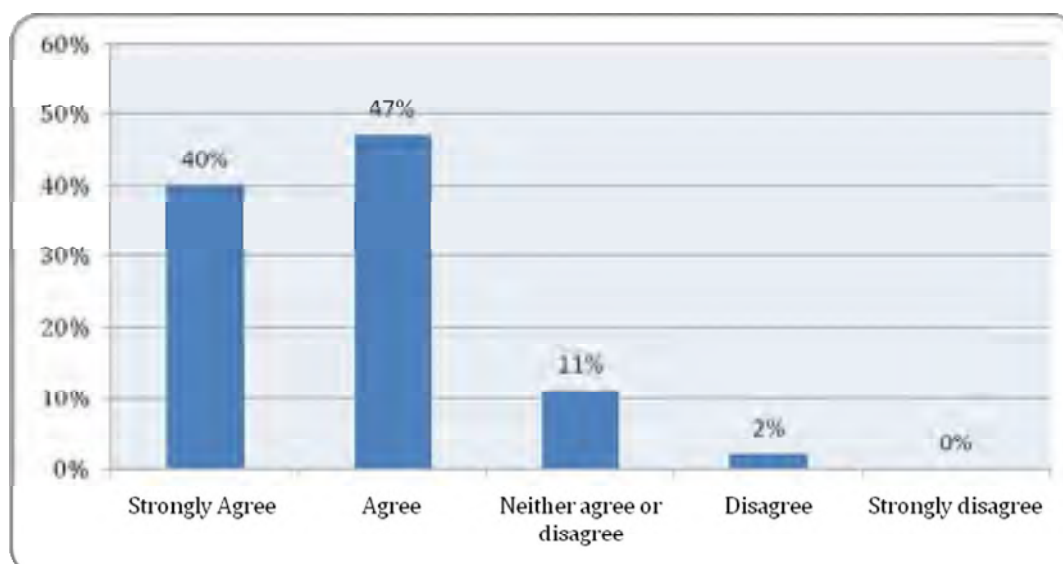


**Figure 6.55: Level of Agreement on Sharing of Knowledge and Skills**

The majority of the respondents felt that adoption of OSILS helps sharing of knowledge and skills among the library professionals. Nowadays library professionals are more aware of the advantages of OSILS and are proactive in sharing their experiences and being involved in its development.

### **OSILS are Flexible and Adaptable**

The rate of responses received for the statement "OSILS are flexible and adaptable for all types of libraries" was 40% strongly agree, 47% agree, 11% neither agree or disagree and 2% disagree. The analysis is graphically represented in Figure 6.56.

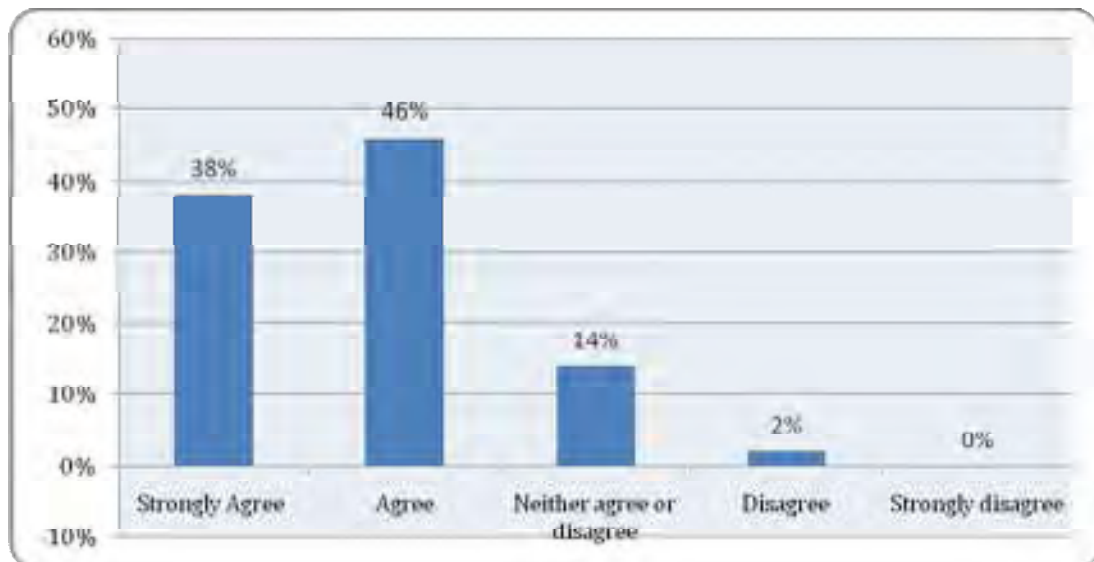


**Figure 6.56: Level of Agreement on Flexibility and Adaptability**

Respondents found that OSILS is more flexible and adaptable for any type of libraries as compared to commercial alternatives. Flexibility is one of the major issues where professionals prioritize when selecting software. The selected software should be suitable for their needs and should also be flexible in the face of future changes. Generally, OSILS is found to be adaptable to any environment, from the small library to large like university library and also to new technologies being developed.

### **Gives More Control Over the Data and Software**

The response rate for the statement "OSILS gives more control over the data and software" was strongly agreed by 38%, agreed by 46%, 14% neither agreed or disagreed and 2% disagreed. Graphical representation of the analysis is showed in Figure 6.57.

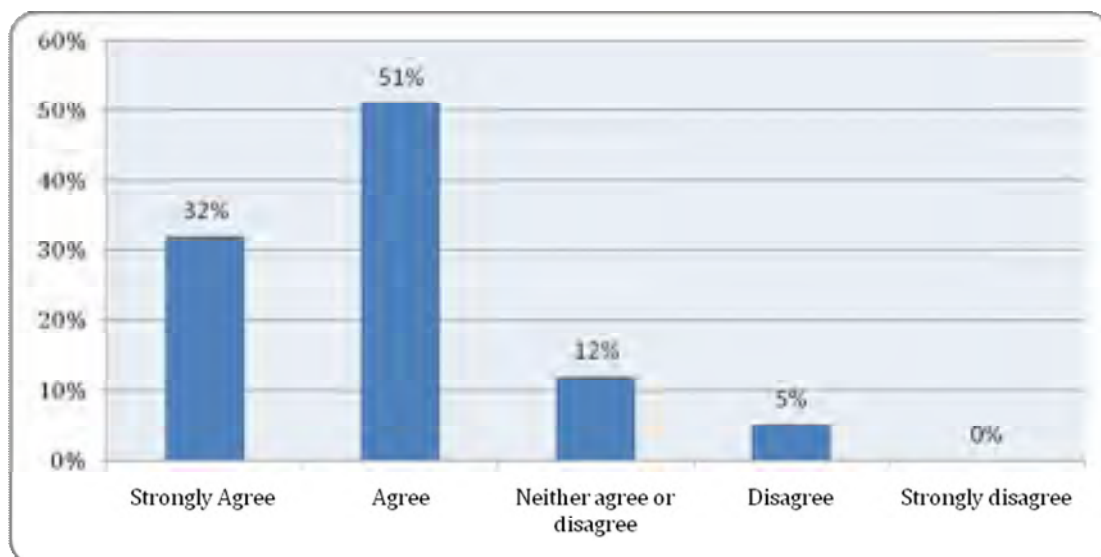


**Figure 6.57: Level of Agreement on Data and Software Control**

OSILS extends exclusive and more control over data and the software. Dependence on commercial vendors in library automation is diminishing and library professionals are gaining more control over the customized use of OSILS to meet their specific requirements. Survey indicated that respondents generally support the adoption of OSILS as they get more control over the software, which is not the case in commercial software.

### **Suitable for Long Term Services Compared**

Respondents were invited to state their level of agreement with the statement "OSILS are more suitable for long term services compared to proprietary systems". Majority of the respondents agreed (51%) and (32%) strongly agreed that in terms of long-term services OSILS are more suitable than commercial systems. However, 12% of the respondents neither agreed or disagreed with the statement, but 5% of them totally disagreed with the statement. The analysis is graphically represented in Figure 6.58.

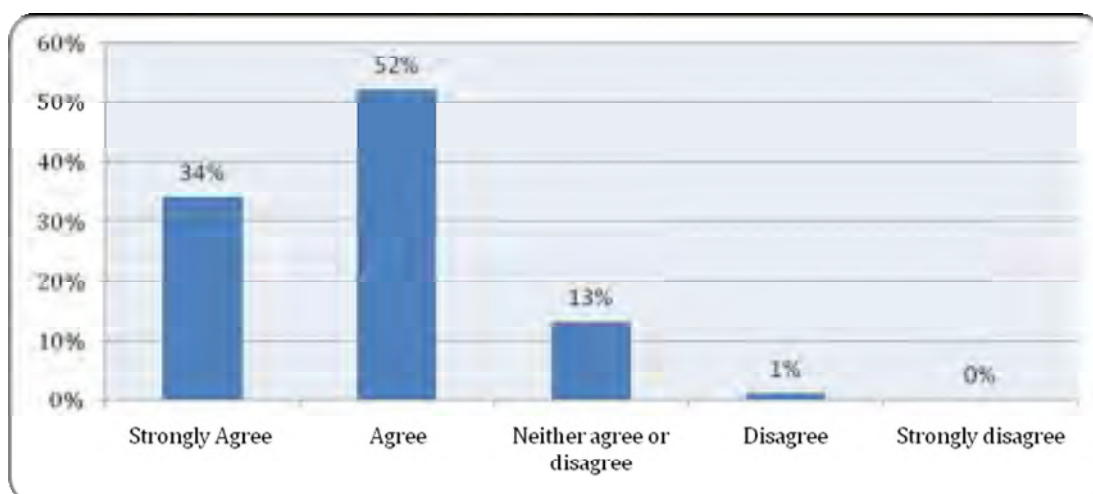


**Figure 6.58: Level of Agreement on Long Term Service**

It is very essential to have a long-term support for the software that is used for local customizations and enhancements. Study indicates that majority of the respondents agreed that there is quicker support for OSILS than commercial software.

#### **Consortia Model for Wider Adoption of OSILS**

On the statement, "Indian libraries should consider consortia model for wider adoption of OSILS" respondents indicated their level of agreement in the order 34%, 52%, 13% and 1% for strongly agree, agree, neither agree or disagree and disagree respectively. Analysis is graphically represented in Figure 6.59.



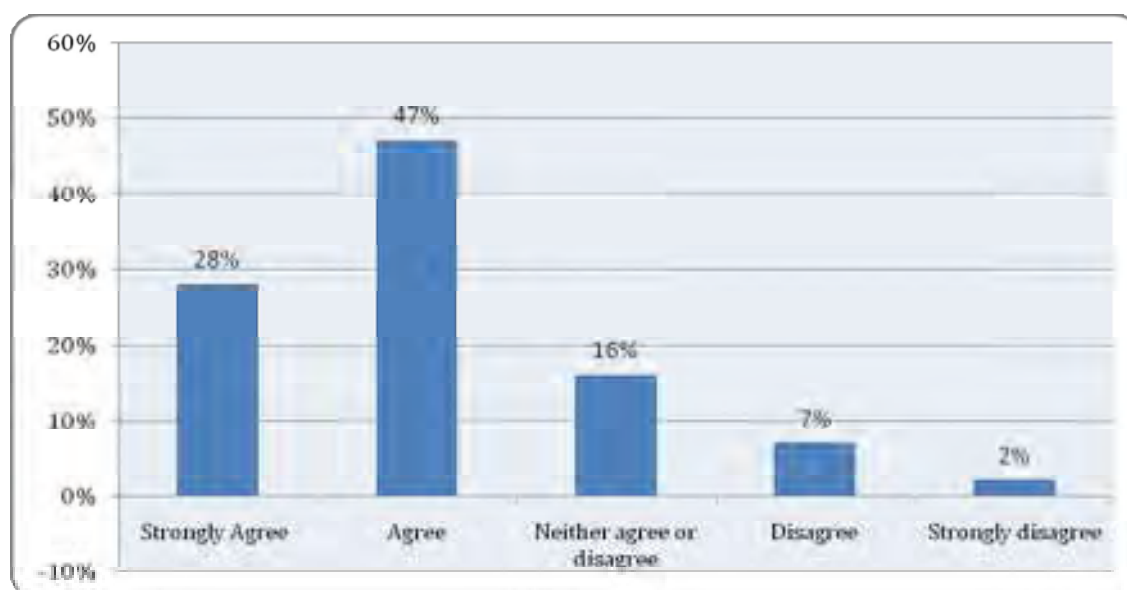
**Figure 6.59: Level of Agreement on Wider Adoption of OSILS**



Majority of the respondents were aware of the advantages of consortia based adoption of the software, which reduces the cost of implementation and maintenance. Branch libraries also can adopt Koha since the software has multi-tenancy features, where all the constituent and associated libraries can use single database not only for accessing OPAC but also for all housekeeping activities such as acquisition, cataloguing, circulation etc. Institution with multiple campuses and libraries can adopt this feature. Instead of maintaining multiple independent systems, single central system-accommodating server, technical expertise, physical infrastructure, hardware etc drastically reduces the cost of adoption. Other activities such as copying the cataloguing records, customizing software, adding new features etc. can be better accomplished from a central place saving time and manpower requirements. Union catalogue of the participating libraries also provide wider visibility, access and delivery of the library materials.

### Single OSILS as Standard

Respondents were asked about the need for having customized version of a particular OSILS, which can be adopted by any type of library. Majority of the respondents agreed (47%) with the need for customized version however many respondents were unsure about the statement and indicated that they neither agree nor disagree with the statement. Figure 6.60 shows it graphically.

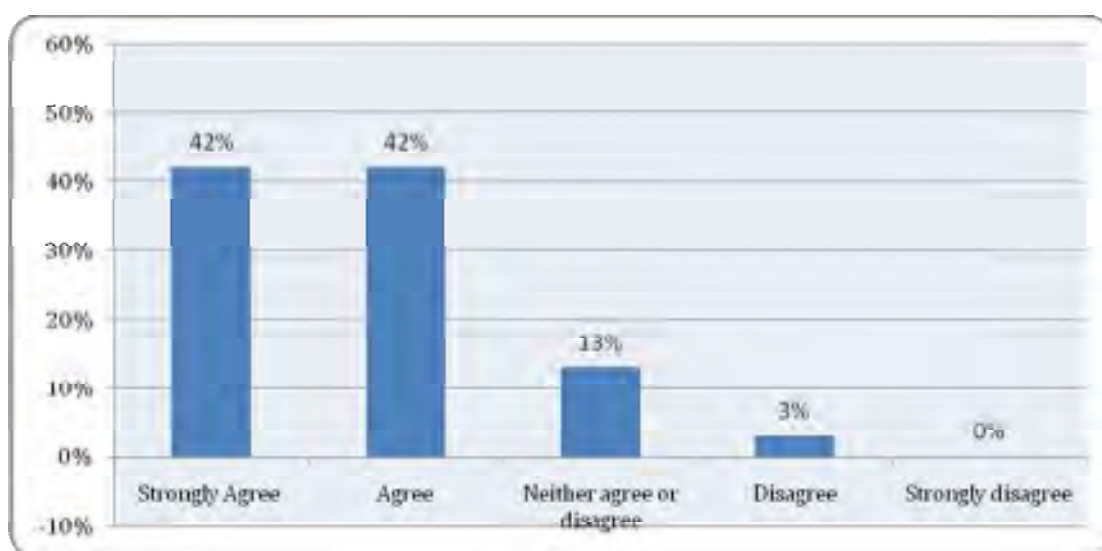


**Figure 6.60: Level of Agreement on Need for Single Customized Version**

The lack of customized version according to the size and type of library is another impediment in the marketing of OSILS. Ideally, the software should have different customized versions to fulfil the requirements of all types of libraries.

### **OSILS Supporting various Indian Scripts**

Respondents were also asked to rate their opinion on the statement “Indian Libraries should have an OSILS to support various Indian scripts”. The rating revealed that overwhelming majority either agreed (42%) or strongly agreed (42%) to the need for a software that supports all Indian scripts. However, a small percentage (13%) neither agreed or disagreed with the statement. The analysis is graphically represented in Figure 6.61.



**Figure 6.61: Level of Agreement on Support of Indian Scripts**

The major drawback of many open source ILS were its incapability to accommodate all Indian languages in its functioning. Therefore, there is a need for a single software program that can support various scripts.

#### **6.6.14. Aspects that Tempt for Migration to OSILS**

It is clear that the primary reasons for most libraries deciding to migrate to OSILS are reduced cost of the software and the ability of the package to facilitate the library professionals to customize the software according to their needs. Other reasons include

freedom from maintenance, license fees, vendor lock-in and the wider adoption, support and online community as well as ease of installation, maintenance and modification. Some libraries opted for OSILS due to frustration with the suppliers of their current commercial ILS. Results of the survey shows that majority of the respondents showed a positive agreement with the statements in the questionnaire and considered migrating to an OSILS. It also revealed that there are many issues and challenges associated with the adoption of OSILS in Indian libraries from its installation or migration to customization. Library community in the country had positive perception towards the adoption of OSILS and there are many promotional activities such as seminars, workshops, training programs etc. organized to increase the awareness and understanding of the importance of OSILS and improve the adoption of OSILS among the library professionals. Study also identified that there should be more promotional activities to encourage the libraries in India to adopt OSILS on a wider scale.

Public libraries in India are generally categorized under poorly funded organizations. It is also clear from the study that many libraries, especially public and school libraries lack quality automation systems due to its high cost on one hand and because they are not able to make use of OSILS. Though OSS based automation initiatives provide an innovative approach to librarians as an economically viable solution for automation, these libraries need to be made aware of the advantages of implementing OSILS. In order to meet the information needs of the users efficiently library professionals should have the ability to install, maintain and customize the software according to their local requirements. However, it is seen that the level of technical knowledge required for LIS professionals to install and maintain OSILS is absent in school and public libraries.

## **6.7. Most Preferred OSILS for Indian Libraries**

### **6.7.1. Functionality and Cost Effectiveness**

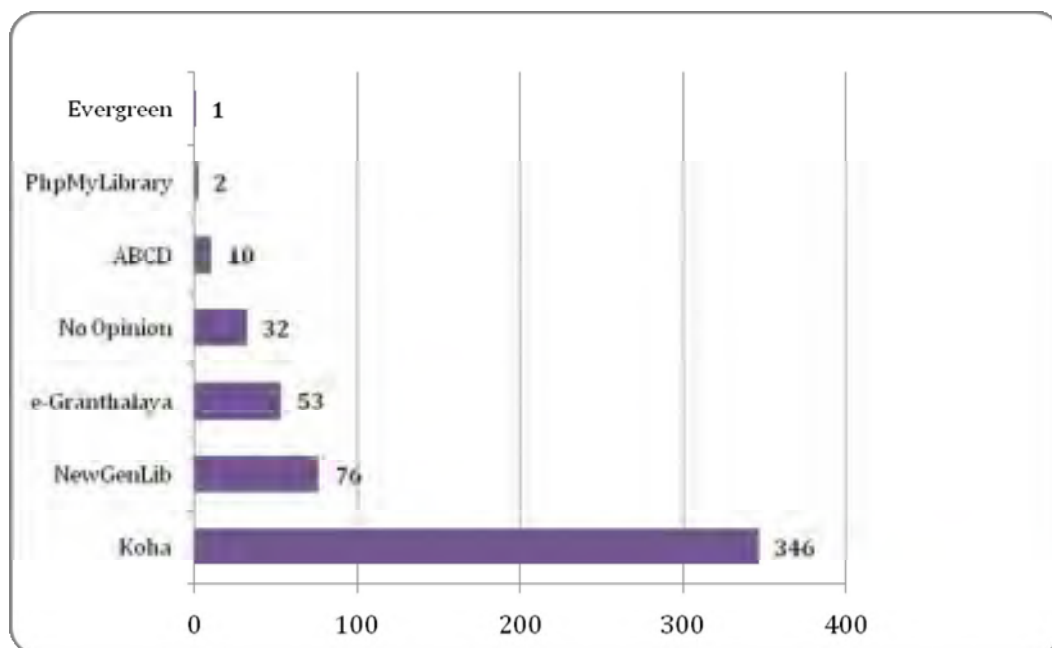
A number of ILS solutions in both open and proprietary streams are available in the software industry. However, many available ILS are not complete and effective in its true sense. Selection of a suitable ILS strongly influences the quality of library services and the expectations of users. Each ILS has lots of similarities with other packages in its features and functionalities but each are different in the level of development and extent of features. Libraries are looking for less expensive but at the same time quality technology solutions to meet the demands of their users and to effectively overcome budgetary concerns. Ever increasing needs and expectations of library users also compel libraries to choose OSILS to provide maximum services economically and efficiently.

There are several aspects to be considered when choosing an OSILS. Selection of and migration to suitable ILS for a particular library is a tough decision. Due consideration needs to be given to factors like size and type of libraries, its collection, services, nature of clients and the software cost, stability, popularity, customization, availability of community for development, its compliance to international standards, data migration etc. No comprehensive study has been done on selecting suitable software for all types of libraries in India.

### **6.7.2. Suitability for Indian Libraries**

Respondents of the survey were asked to vote for their choice of best suitable ILS in Indian scenario. Respondents were given the choice of selecting their software from the list provided that includes ABCD, e-Granthalaya, Evergreen, Koha, NewGenLib, PhpMyLibrary etc. The results of the survey shows that 67% of the respondent opined that Koha is the best suitable OSILS for Indian libraries. The analysis is graphically represented in Figure 6.62.

It is seen that Koha, NewGenLib, e-Granthalaya, ABCD and Evergreen have been identified by the respondents as the OSILS suitable for Indian libraries.



**Figure 6.62: Best Suitable OSILS in Indian Libraries**

Further analysis indicated that Koha is the most suitable OSILS suggested by majority of the respondents followed by NewGenLib, e-Granthalaya, ABCD, PhpMyLibrary, and Evergreen. Hence, a deeper study was conducted to analyse the identified software.

The analysis was limited to Koha and NewGenLib as these received the maximum response while the response for other software is insignificant and does not seem to have many takers. Other OSILS software developed in India and abroad have not had many adherents in India. ABCD, in particular is a full-fledged ILS in open source platform but still has less number of respondents as it is just released software which does not have a critical mass of users, developers and contributors. A respondent who had migrated to Koha from e-Granthalaya mentioned the reason as “e-Granthalaya may not be internationally competitive”. He further added that “we are living in a competitive world. We wanted to have an OSS which will take care of future developments effortlessly and integration with latest RFID technologies etc., becomes easy with Koha software”

The larger the adherents/users of any OS product, the better are the chances of its sustainability. Among Koha and NewGenLib software, the following factors are considered important in ensuring long-term sustainability.

**a). Ease of Installation** (without explicit support by developers/specialists): Koha requires a good understanding of the Linux operating system. Given that there are many distributions of Linux, this makes Koha installation a non-trivial challenge. However, some active users and professionals have developed installation packages which should make installation easy. NewGenLib (NGL) is available under both Windows and Linux. An important feature of NGL is that it was developed taking into account typical Indian library practices and customs. An advantage of NGL is that its developers were experienced in these practices and therefore were able to build the software to suit these practices. However, NGL also incorporated international metadata and other library standards in its development.

**b). Affordability of Annual Maintenance:** It is difficult to commit to pay Annual Maintenance Charge (AMC) regularly by users in the initial stages. Some Indian libraries have used the support of a commercial company to install Koha. It is not known whether some commercial companies that have promoted Koha in India charges annual maintenance fees from Koha users. Koha can be installed by the user itself with the help of step-by-step instructions available in the public domain, or by approaching some volunteer working professionals or even using live DVDs etc without any AMC. Though it is nominal, NGL charges some annual maintenance charges (AMC).

**c). Nature of Trouble-shooting and Customization Support** (commercial and/or user community-based that is available): Many professionals extend their free support through both online and offline modes to help the users in the area of customization and trouble-shooting support. All trouble-shooting and customization support of NGL rests with the parent company. At NGL, trouble-shooting is entirely done online. The requesting library calls NGL and then provides remote access via the Internet to the NGL installation on the library's computer/server. The librarians at the library witness the trouble-shooting being done so that they become familiar with the root of the problem and the solution approach by engineers at NGL.

**d). Active User Community:** (to provide feedback to developers on special or new needs of Indian libraries): Koha has an active user community. Some proactive Indian users of Koha have taken initiatives to promote and distribute Koha. There are also a number of

training programmes organized by Koha. Indian users of Koha contribute to and/or benefit from user forums and are effectively involved in supporting problem-solving and troubleshooting of new and existing users of Koha in India. These initiatives point to the desire to make Koha sustainable, worldwide. NGL does not have as vibrant and as open a user community as Koha although the number of NGL users in India is sizable. From the experience of NGL users, there is widespread satisfaction regarding the free one-time support that they get when they face problems even if they are not on AMC. Many users have benefitted because of this attitude of NGL. NGL does not organize courses on NGL like the protagonists of Koha unless a library requests such courses. Instead, NGL organizes adoption programs. In these programs, a library that wishes to work with NGL agrees to a 48-hour schedule (4 days of 12 hours each) in which NGL staff do an online installation on the library's server and client machines, take library metadata in a suitable format for it to be converted to MARC-2 format, provide basic training in metadata creation, and system administration. This service is entirely free and enables the library to quickly install and begin working with NGL. Any further training required is offered on payment.

**e). Active Developer Group** (or company that updates and upgrades software capabilities): The original developers of Koha were from New Zealand. The source code of Koha is freely available under the GNU Public Licence to download and customize according to the local requirement. In NGL, the parent company takes full responsibility for further development of the software. A cloud-based version is being developed and in all probability will be offered to NGL users in 2016. NGL team has a few but well paid developers who take full responsibility, both for trouble shooting and new developments, testing and deployment. NGL's long-term sustainability is dependent on how long such a committed development team can be maintained and retained.

**f). Public Support** (to innovations in the area of knowledge-based product or service): The development, deployment, updating and upgrading, marketing and support of an OSLIS require considerable ongoing investment of skills and funds. Koha was fortunate that in being incubated by a forward-looking consortium of the New Zealand Government. After, its development many commercial companies came forward to provide paid support to

libraries. One of the sad facts of India is that there was little or no encouragement for start-ups in India when NGL development had begun in 1995. Two individuals: one an experienced librarian and another a Java programmer began the company (Verus Solutions Pvt. Ltd.) which took on the task of developing the OSLIS. After about 5 years of its development, it was sold as commercial software. Thereafter, it was declared open source under GNU public licence. The situation has not changed much. Long-term sustainability of NGL and other knowledge-based software will, to some extent, depend on the support that it gets from Government, as well as publicly funded institutions such as state and central universities.

Considering the various factors, organizations and governments have selected Koha as the best suitable software for Indian libraries primarily because of its impressive features and a growing community worldwide. Koha is a full-featured award winning OSILS and it works under GNU General Public Licence (GPL). It is platform independent software and supports all the house-keeping operations of most types of libraries. Being supportive to regional languages and due to its fast growing community, Koha is becoming the favourite software in Indian libraries. It has all the features of a modern ILS to meet the needs of library staff as well as users. Koha is getting constant development support from libraries, companies and volunteers worldwide.

### **6.7.3. History and Background of Koha ILS**

Koha is the first full featured OSILS that started its development in the year 1999. It was developed by a group of libraries under Horowhenua Library Trust in New Zealand to solve the Y2K compliant problem with their existing legacy commercial software named 'Catalist'. The consulting company named Katipo Communication Ltd. developed the product Koha for the Trust. Unlike other software the name Koha is not an acronym and the word comes from Maori meaning 'a special kind of gift' or 'a gift with expectations'. The company made the software under open source and licensed it under GNU GPL and the libraries under Horowhenua Library Trust started using Koha software in 2000. They found the capability of Koha in handling the resources and started releasing new versions with updates by correcting the errors and adding new features. The initial version of Koha was quite adequate for three libraries under the Trust that together served a community of about



30,000 residents with a collection of about 80,000 volumes. At that point, Koha did not have some of the features considered mandatory for most libraries— no support for MARC, Z39.50, SIP, or NCIP. It did not seem scalable to handle the load of very large libraries (Breeding, 2008b).

Interest in Koha increased day by day and more libraries were adopting it or migrating from the existing commercial software to Koha and started developing it further. The company has added more features such as MARC, Z39.50 support, integration of the Zebra XML-based data storage and retrieval etc. in its later versions. Further updates were released continuously with high performance modules and functionalities.

#### **6.7.4.Features of Koha ILS**

Koha as stated earlier is an OSILS. The software consists of two parts: the user interface (OPAC) and the librarian interface (the staff client). The librarian interface allows librarians to perform all house-keeping operations of the library. Circulation, patrons, advanced search, lists, cataloguing, authorities, serials, acquisitions, reports, tools and administration, for all these functions modules are available in the staff client interface.

Koha is licensed under GNU General Public Licence, which is more future proof than proprietary software thereby more open to customization. Implementation of Koha has met full satisfaction among Indian library professionals for the last decade as the software has been highly revised and improved with frequent updations by a team of professionals spread worldwide. They interact with each other through active online platforms such as e-mail group, blog, wiki, discussion forums etc. According to Paine College Collins-Callaway library Koha is known for its track records, international implementation, awards, options for being hosted and easily accessible options (Dennison, 2011). The comparative analysis of Koha and NewGenLib shows that, though both software packages are more or less equally important in different aspects, Koha is found to have more specific advanced and developed characteristics of open source ILS that makes it the most used software among clients. (Singh and Sanaman, 2012)

Koha's interoperability and flexibility are the most common advantages of OSS, which gives hope for further development and successful linking with other software and services. (Tea Conc, ). Expandability is another characteristic which is present more in Koha as the software can be expanded, changed and modified as per the need of the client by enabling easy configuration of source code, administrative and set up parameters. Technical works for implementation of Koha can be done by library professionals at zero cost with little efforts (Mishra, 2015). Koha consist of advanced database features. Koha provides quality support in the everyday work of the Library and enables further development of its services (Tea Conc). Koha also provide facility to add new features. Sample screenshot of the administrative homepage of Koha software is represented in Figure 6.63



**Figure 6.63: Administrative Homepage of Koha**

Koha has simple and attractive interface with self-explanatory functional modules, which demonstrate the maturity in its design and development. Koha has comprehensive functionalities with sophisticated modules to perform all the house-keeping operations of any type of libraries. Koha provides more functionality with less system and software requirements. Koha reduces efforts of staff in routine works of the library and drastically enhances the user based online services along with web 2.0 based services without investing a single penny on adoption of new ILS (Mishra, 2015)

#### **6.7.5.Reasons to Prefer Koha**

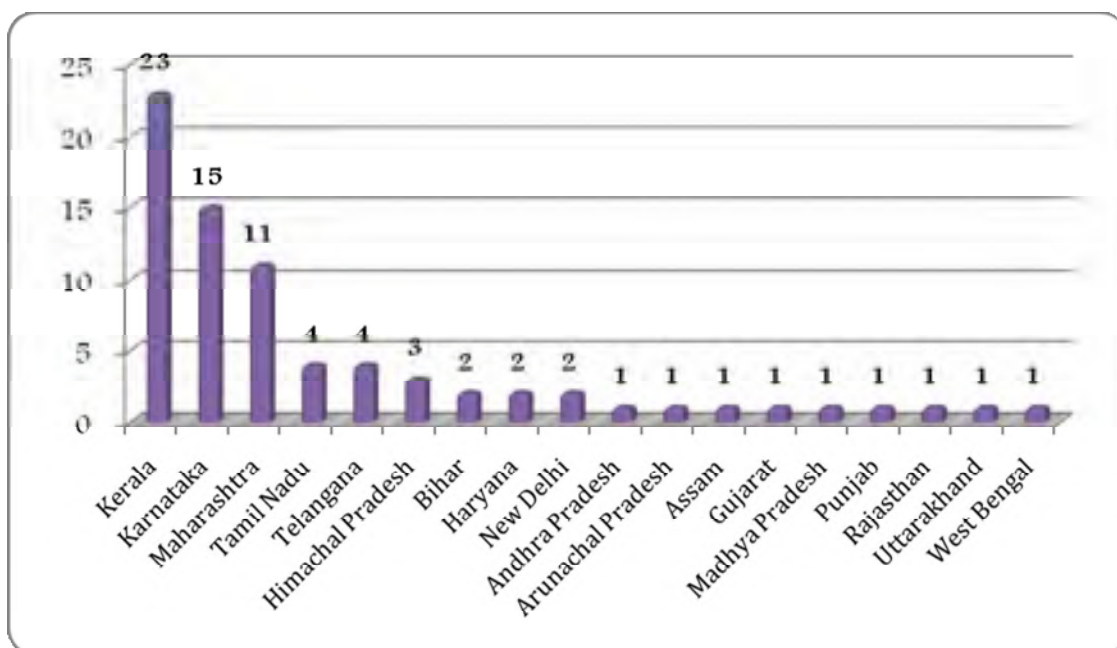
Koha is very popular and highly supported software by various libraries throughout India for the last two decades and the Indian library professionals expressed positive sentiment on adoption of Koha. Many libraries in India have successfully implemented Koha OSILS and there is a drastic rise in the rate of adoption of Koha software during the last decade among Indian libraries. The following were found from literature reviews and analysis, to be the specific reasons why Koha stood first in its adoption among the Indian libraries;

- 1) Koha continuously updating and improving its features and functionalities
- 2) Koha is the only software under OSILS which is widely adopted in Indian libraries
- 3) Koha has a larger and very active community of user group and developer group
- 4) Koha has a wide range of support service either paid or free
- 5) Koha software users have high user satisfaction with its modules and functions
- 6) Koha modules can satisfy the basic house-keeping operations of any type of library
- 7) Koha supports both MARC21 and UNIMARC metadata standards
- 8) Koha has more additional functionalities and characteristics of advanced next generation software including web 2.0 features
- 9) Koha has user friendly Web OPAC with maximum search options and customizable interface
- 10) Koha is a web based ILS which supports a full Unicode character set
- 11) Koha is efficient and successful in managing e-books
- 12) Koha is a multi language support software with multilingual WebOPAC
- 13) Koha use open source LAMP software architecture which is more stable and powerful
- 14) Koha supports Barcode technology, RFID technology, self checkout and inventory control
- 15) Koha has availability of virtual book shelf
- 16) Koha provides any kind of reports and statistics via report wizard or SQL or statistic wizard or predefined reports
- 17) Koha is compliant to International standards for migration and data interoperability
- 18) Koha is distributed under Open Source GNU General Public License

- 19) Koha has its own community website, wiki and an officially elected development team responsible for new releases and updates and conducts exclusive international conferences
- 20) Koha supports multi-branch libraries and multi-users.
- 21) Koha software is matured, reliable and better established in its category of OSILS
- 22) Koha software is available in many languages and English, French, Greek, Chinese, German, Italian are few of them
- 23) Koha has excellent online catalog functionalities and comprehensive advanced search options
- 24) Koha software has high flexibility in making local customization
- 25) Koha is rich in quality documentations in the public domain
- 26) Koha has flexible data entry sheet which can be customized
- 27) Koha has options for budget management
- 28) Koha is capable of supporting large library consortia. Design of the software is consortia friendly.
- 29) Koha comprises flexibility options for further improvement, enhancement and development
- 30) Koha has simple and attractive interface for both the user and the administrator
- 31) Koha has single interface to access administrative tools
- 32) Koha has printing options for various reports, spine labels and barcode labels

#### **6.7.6.State Wise Response on Koha**

The rate of response shows that maximum numbers of Koha users are from the state of Kerala and from two other states-Karnataka and Maharashtra also there are significant numbers of responses on adoption of Koha software. States of Tamil Nadu and Telangana were the other two states having equal number of responses for Koha software and Himachal Pradesh was the state just behind these two. Responses were also received from the states such as Bihar, Haryana and New Delhi equally. The analysis is represented graphically in Figure 6.64.

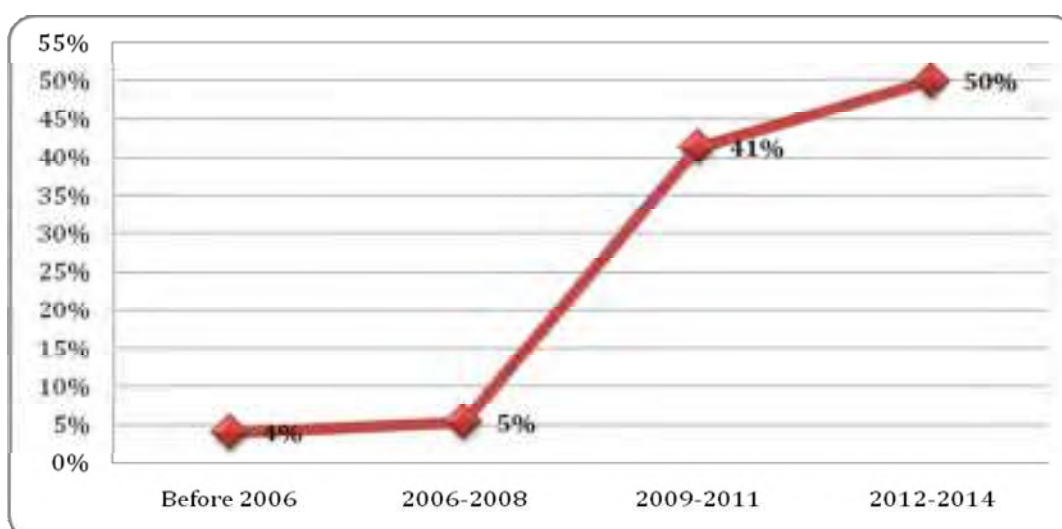


**Figure 6.64: Rate of Respondents on Koha form Indian Libraries**

Koha OSILS has made a great impact in southern states of India especially in Kerala. Among the northern states Maharashtra made favourable climate for adopting Koha software.

#### **6.7.7. Progression of Koha Adoption in India**

Koha has been a very successful OSILS compared to other ILS software. The extensive adoption and its constant support from the user community are influencing more libraries in India to adopt Koha for smooth running of their library. In order to measure the progression rate of Koha software among the Indian libraries, respondents were asked to mention the year of adoption of Koha software for their libraries. It was found from the study that over a period of time there is a significant increase in the rate of adoption of Koha in Indian libraries. From the year 2006 to 2014 there has been a steep increase. The trend of Koha adoption has been highly progressive which is 50% in 2012-2014 compared to 41% adoption in the previous year range 2009-2011 and 5% in 2006-2008. Graphical representation of the analysis is depicted in Figure 6.65.



**Figure 6.65: Progression Rate of Koha Adoption**

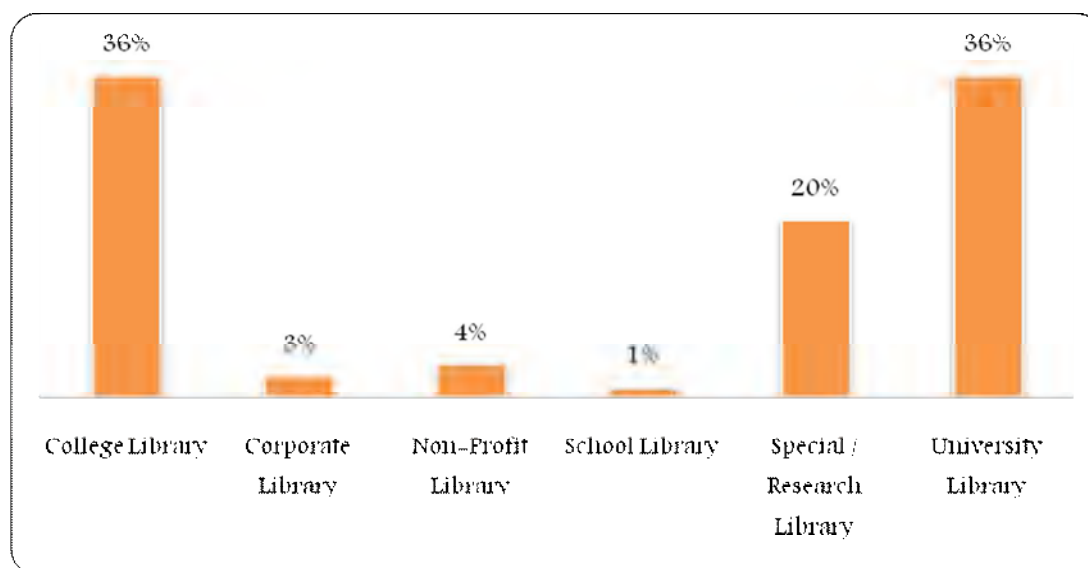
Koha open source ILS developed in the year 1999 and was released in 2000. The study revealed that the choice of Koha software was not immediate in the beginning and the libraries have been slow to adopt Koha software until 2006. However, it has become a very successful OSILS compared to other software of its kind in Indian libraries in the last decade. The extensive adoption and its constant support from the user community are influencing other libraries to adopt Koha. The analysis also shows that there is a drastic rise in the rate of adoption of Koha software during the last decade among Indian libraries. It is evident from the survey response that the scope and popularity of Koha software has grown tremendously with widespread use among Indian libraries during the last four years.

Though other few software like NewGenLib, ABCD, Evergreen and e-Granthalaya also have minimum rate of adoption Koha has a higher growth rate of adoption and popularity in Indian libraries, when considering the popularity, rate of adoption, positive perception of the community towards Koha, frequent updates, large community and expertise, frequent learning programs, conferences, seminars and workshops at national and international level to get instant solutions for any kind of issues/bugs etc.

#### **6.7.8. Types of Libraries Using Koha**

The ability of Koha software in its flexibility to modify and fit into the needs of any type of library has been its major advantage. From the total responses received it is learned

that university libraries (36%) and college libraries (36%) have successfully adopted Koha for their library management where-as the proportion of research libraries (20%) is also has significant number of adoptions. Adoption of Koha is not satisfactory among non-profit libraries (4%), corporate (3%) and school libraries (1%). The anlysis is graphically represented in Figure 6.66.



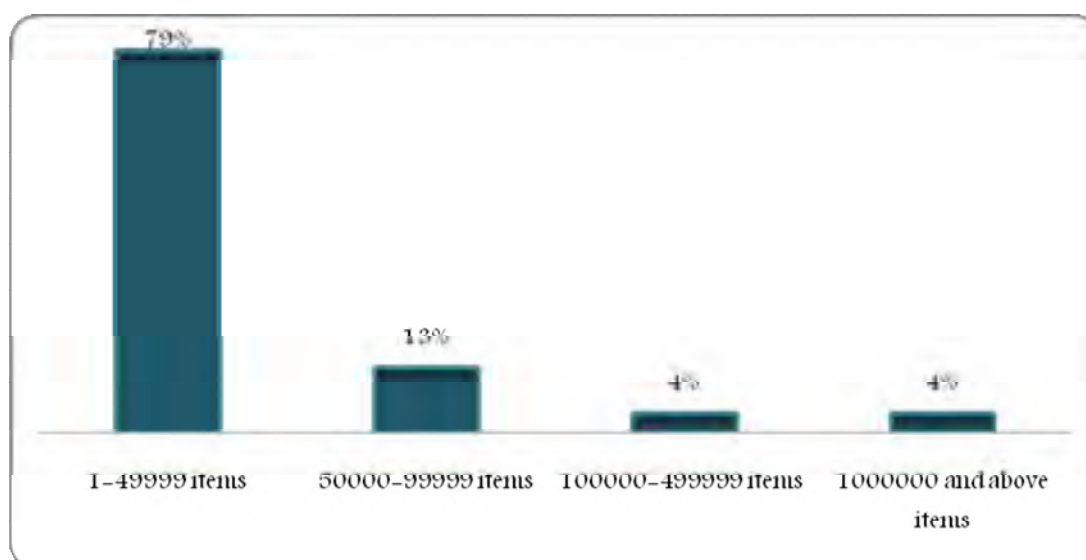
**Figure 6.66: Types of Libraries Using Koha Software**

Koha ILS is being used worldwide not only in university and college libraries but also in school, special and public libraries. In special/research and university libraries where special user needs arise every day the functional requirements in library software would be much more than that of a school library. The ability to run with the ever changing technological aspect is one of the greatest challenges of the day. Koha is proved to be an OSILS that is able to incorporate the additional applications which are open source in nature. Above statistics shows that penetration of Koha software is very significant in university, special and research libraries, however college libraries were observed to be having less number of adoption.

#### **6.7.9.Suitability In-terms of the Collection**

To measure the suitability of Koha for respective libraries having different sizes of collection, respondents were asked to indicate their collection size in-terms of their

holdings. For the purpose of clear analysis, the responding libraries were divided in to four groups based on their collection (Fig). There were 78% of libraries with a collection range of 1-49999 and 16% of libraries possessed 50000-99999 documents. Figure 6.67 depicts the graphical representation of the analysis.



**Figure 6.67: Size of Library Collection of Respondents**

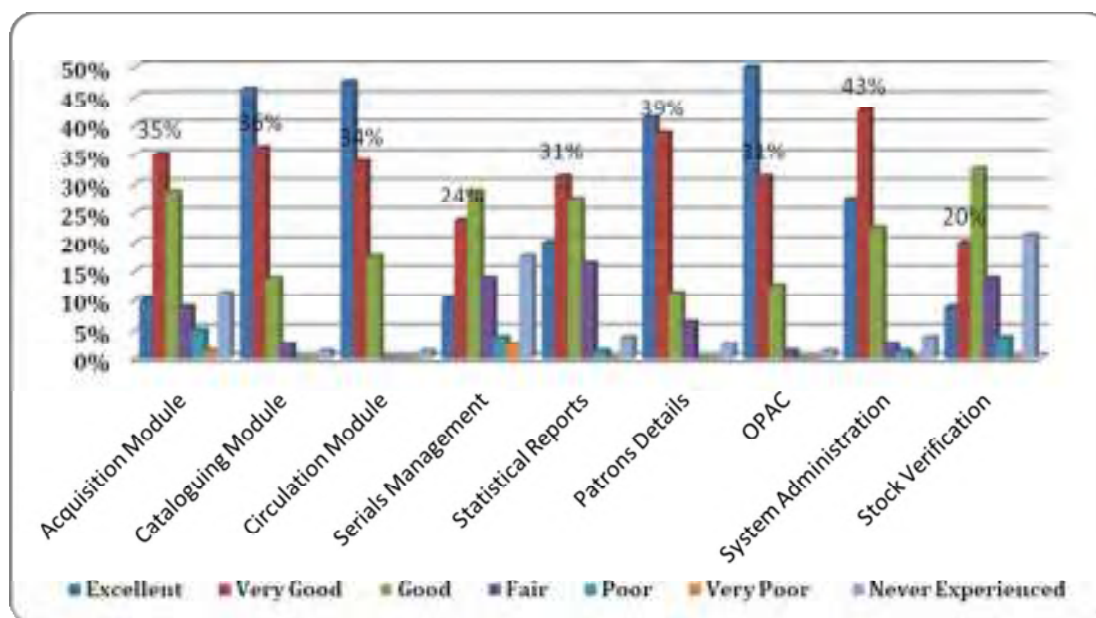
The result of the analysis confirms the ability of Koha to be an effective OSILS to cater to the needs of small libraries to libraries with large size of collections. Libraries of all type and size are beneficiaries of using Koha software.

#### **6.7.10. Satisfaction with Functional Modules**

In order to measure the experiences of users on using various modules, respondents were asked to indicate on a seven points scale as Excellent, Very Good, Good, Fair, Poor, Very Poor, Never Experienced respectively. The study revealed that OPAC module of Koha seems to be more efficient with 54% of participating libraries considering it as excellent. Adoption of Z39.50 has enabled Koha to perform retrieval task with an excellent rate of precision. Circulation Module (48%) and Cataloguing Module (46%), a cognitive task of managing records have gained popularity among modules of Koha. Using software generated reports is comparatively less in Indian libraries which may be due to the difference between the format available and requirement. Hence, in the present survey it says 20% professionals see the report generation in Koha as excellent and this is followed



by 31 % (Very Good), 28% (Good). In the modules, which were never experienced, the stock verification and serials management modules have got the highest of 21% and 18% orderly. Analysis is graphically represented in Figure 6.68.



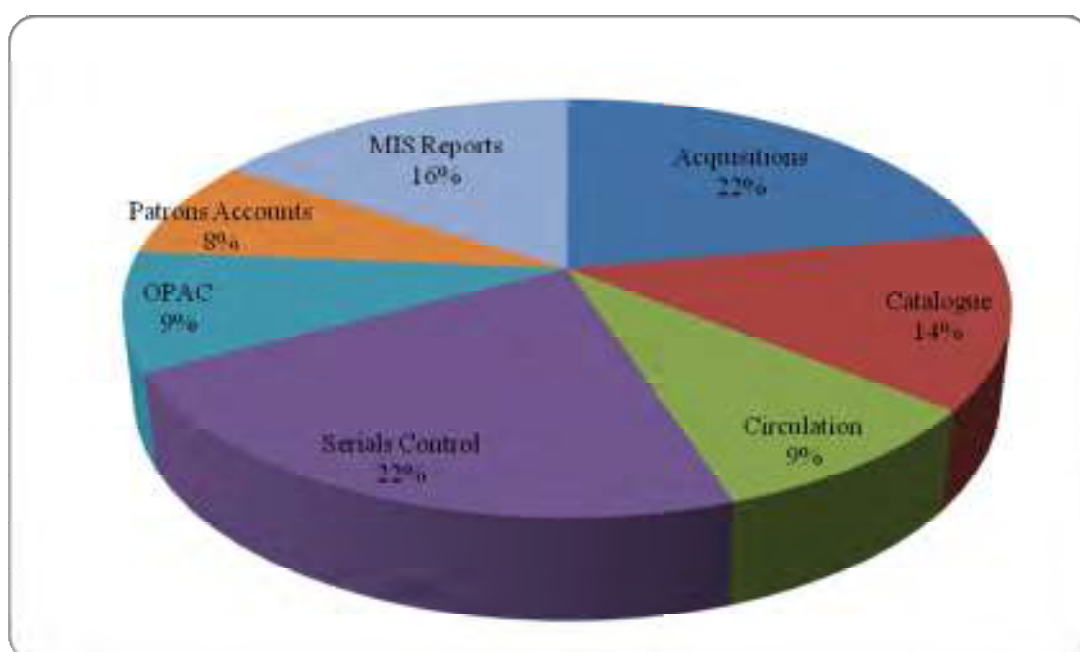
**Figure 6.68: Level of Satisfaction with the Functional Modules of Koha**

Koha has achieved almost all development and can manage most library operations with facility for customization of different aspects. Koha gained much popularity for its continuous updating to cater to the needs unlike earlier OSILS which have limited kind of applications which were not sufficient or not completely suitable for a library's needs. Creating original catalogue records or extracting records through copy catalogue is fully supported in Koha. In view of the overall modules the rate of Poor and Very Poor are significantly less which is an evidence of Koha flourishing with the modules provided. Analysis also reveals the truth that Indian libraries have a trend where records on serials and Stock verification are maintained manually though the software provides devoted modules to perform the task.

#### **6.7.11. Modules to be Customized in Koha**

To get an idea for further improvement of the software Koha users were asked as to which functional modules needs to be customized. The respondents indicated that Serials Management (23%) and Acquisitions (23%) modules were the major modules that need

revisions in their functions. Respondents also indicated that the modules of MIS reports (15%) and Catalogue (13%) of Koha also need to be customised up to some extent according to their specific needs since these modules lack many functions that are to be performed in libraries. Apart from these modules, OPAC, Circulation and maintenance of users account are of concern that Koha users think need modification. Figure 6.69 represented the analysis diagrammatically.



**Figure 6.69: Functional Modules to be Customized in Koha**

Procurement of Serials is a huge investment in any library and is very significant as they are important as primary source information. The amount of libraries using web enabled Serial Management and Acquisition is not huge due to the local variation in the procedure that every library would follow.

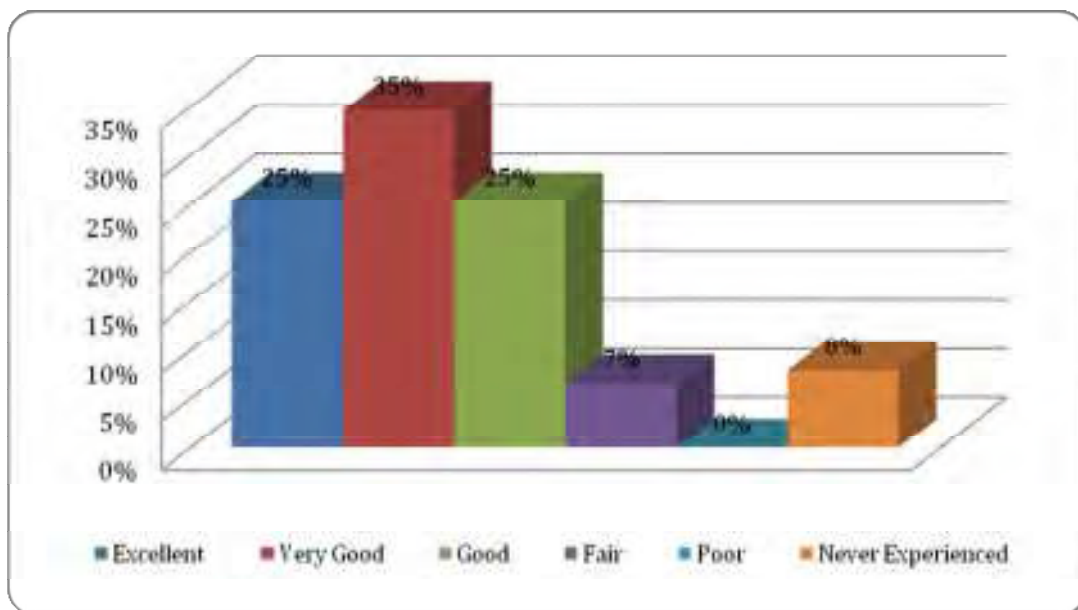
#### **6.7.12. Satisfaction with the Features of Koha**

Apart from the basic functions and features of the software, users were asked to rate their level of satisfaction with the selected advanced features such as installation of the software, maintenance of database and backups, features and functionalities of modules, customizations and integrations, housekeeping operations, report generations, technical and community supports, availability of documentation, responses of the users, upgrades and

enhancements, design and coordination of statistical reports and managing print and electronic resources.

### ***Software Installation***

Installation is one of the major and initial processes involved in any software adoption. To ascertain the level of satisfaction of the respondents a measuring scale from Excellent to Poor was provided to record their experience. A higher majority (35%) of the respondents feel that the installation process of Koha is 'very good' and an equal percentage (25%) of the respondents marked it as 'excellent' and 'good'. Opinions recorded for 'fair' was 7% and 'never experienced' was 8%. However, none voted for installation module for Koha as 'poor'. Figure 6.70 represent the analysis graphically.



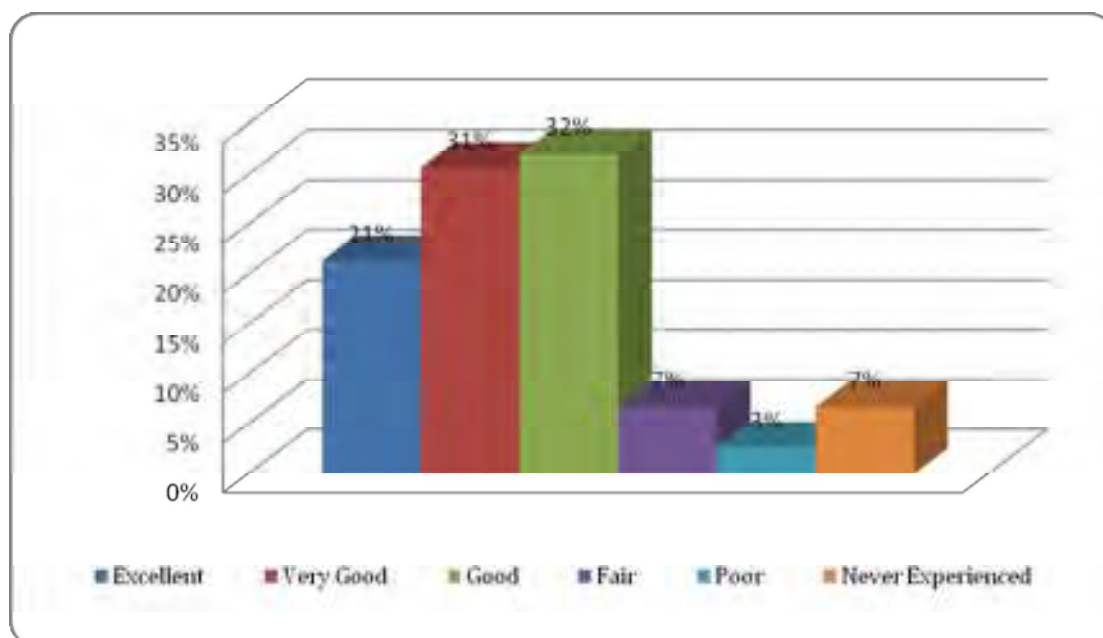
**Figure 6.70: Level of Satisfaction with Installation Module**

There is a higher percentage of professionals' who outsourced their installation part to a third party. Results revealed that installation is the most difficult part of adopting Koha software. However, most of the respondents agreed that they had made trial installations prior to its outsourcing and had gained some practical experiences. Third party or vendor services on annual maintenance cost are available to solve technical and database problems. Also onsite installation, configuration, customization, data migration, hosting and

maintaining even in the cloud environment, training, support even with frequent updates are also available. As Koha is built on open source technologies the installation requirement is less and easy.

### ***Database Maintenance and Backups***

The survey participants' were asked to record their level of satisfaction with the database maintenance and backups activities in Koha software. These were marked as excellent, very good, good, fair, poor and never experienced. Responses to these are at the rate of 21%, 31%, 32%, 7%, 3% and 7% respectively. Graphical representation of the analysis is shown in Figure 6.71.



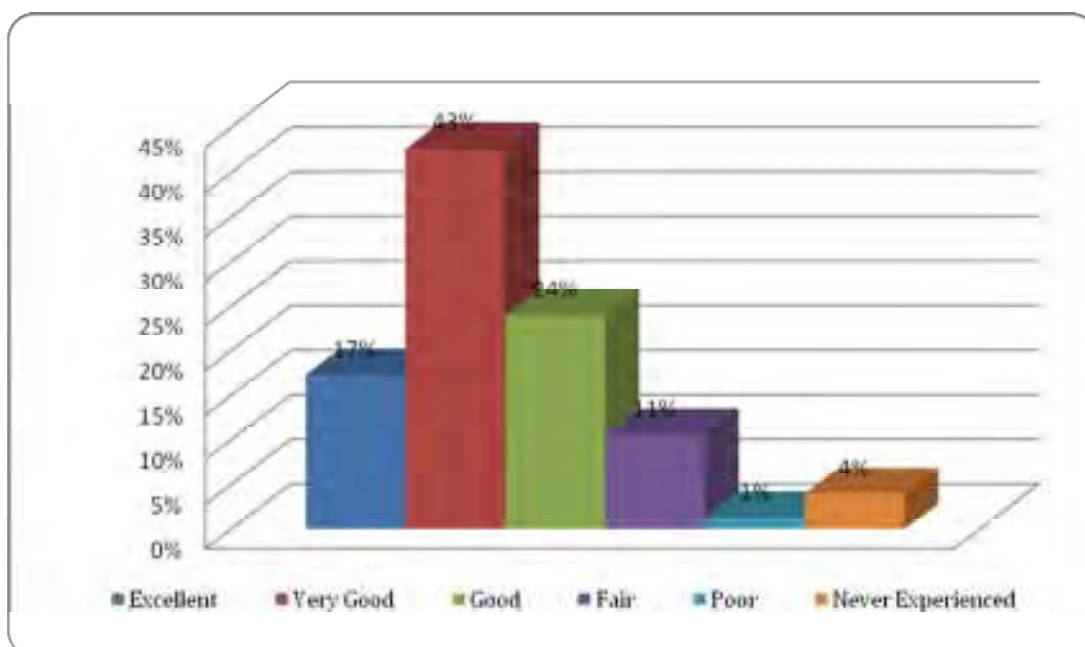
**Figure 6.71: Level of Satisfaction with Database Maintenance and Backups**

Installation and maintenance of Koha software can also be done on Cloud where the availability of the server will be 24x7 and there is no need of in-house server. The library will be assigned a separate domain name for OPAC. Administrator of the system will be able to access the server system using remote logins. Cloud based systems have the advantages of server security, data safety, daily backups, flexibility in accessing resources, etc. and reduces the cost and work involved in infrastructure, in-house installation processes and maintenance. However, as the cloud based systems are internet dependent

any interruptions in the local or server network leads to the suspension of the entire service and activities of the library. Moreover the confidentiality and privacy of the data is a prime concern as the ownership of the data remains with the service provider.

### ***Features and Functionalities of Modules***

Respondents were asked to indicate their level of satisfaction with Koha software on the features and functionalities of available modules. Comparatively higher percentages (43%) of respondents indicated that the features and functionalities of Koha modules are 'very good'. The other responses were in the rate of 17% excellent, 24% good, 11% fair, 1% poor and 4% never experienced. The analysis is graphically represented in Figure 6.72.

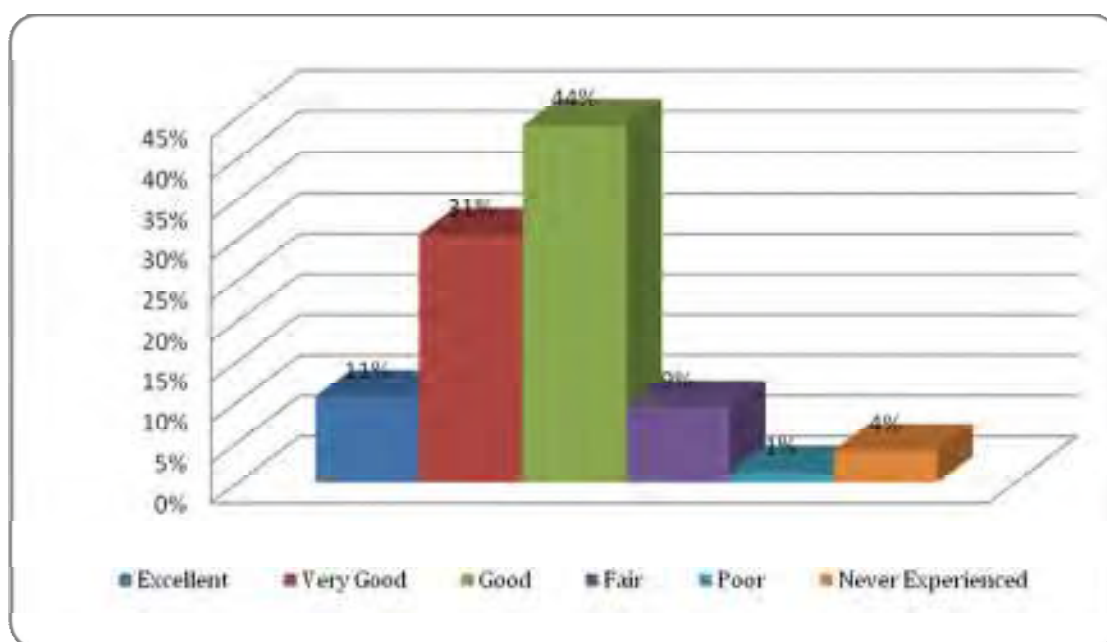


**Figure 6.72: Level of Satisfaction with Features and Functionalities of Modules**

Features and functionality of modules have influenced the professionals as majority have marked Very Good. Koha supports Indic scripts, creating original catalogue records or extract records through copy catalogue, multilingual collections, multi user and multi security level, Unicode, Server-Client technology, tagging, creation of lists suitable for Indian libraries and customizable search and federate search as well as with the incorporation of web 2.0 technologies.

### ***Customization and Integration***

Analyzing the response data, it was found that majority (44%) of the respondents marked the customization and integration facility of Koha as 'good'. The rate of response for 'very good' was 31% and excellent was 11%. Level of responses for 'fair', 'poor' and 'never experienced' were 9%, 1% and 4% respectively. The analysis is represented graphically in Figure 6.73.



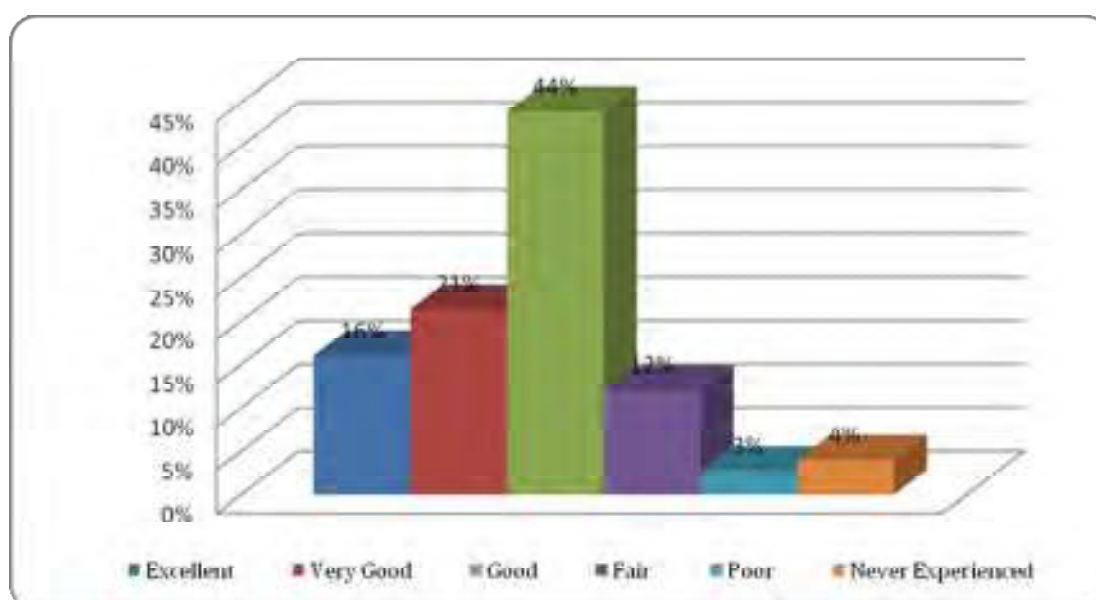
**Figure 6.73: Level of Satisfaction with Customization and Integration**

Koha is also a better option for large universities and academic institutions with different libraries in their affiliated centres. More open to customization to meet the specific needs of the library Koha is more attractive than other software. Koha software has all features for multi-tenancy applications that enable organizations to create centralized database with decentralised house keeping activities for managing the records and services of all the participating libraries individually. Each library will have their own control on their respective data. Unicode facility in Koha enable the libraries to record their resources in their own regional languages. Koha has provision to generate Membership ID cards along with the photograph uploaded and can be printed directly from patron records. Areas of improvement and customization of the software modules needs to be identified and rectified. Online Public Access Catalogue module is the basic part of the ILS which

enhances the experience and interest of the patrons. The current OPAC are far better compared to prior generations.

### ***House Keeping and Report Generation***

The survey participants' experience in performing different house keeping activities and report generation on Koha were checked in the survey. It was well noticed that a higher majority (44%) represented these modules in Koha as 'good'. Only few respondents (4%) commented that the house keeping and report generation modules of Koha were poor and 4% of the respondents never explored these operations. 16% and 21% of the respondents marked these options as 'excellent and 'very good' respectively. Graphical representation of the analysis is made in Figure 6.74.



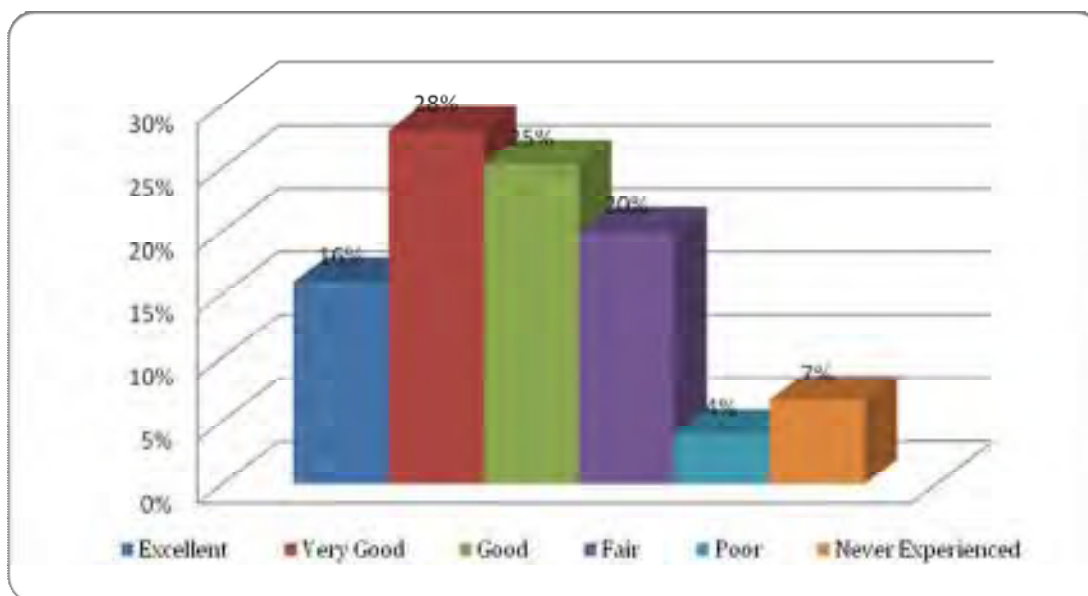
**Figure 6.74: Level of Satisfaction with House Keeping and Report Generation**

It is true that Koha accommodates all basic modules required to manage the essential house-keeping operations of a library. The generation of various reports is very important to get statistics of library when the performance of a library is to be measured. Koha provides integrated report facility including acquisition, catalog, vendor, order and invoice queries.



### ***Technical / Community Support***

The level of satisfaction experienced with the technical and community support of Koha software was marked by the respondents as 16% excellent, 28% very good, 25% good, 20% fair, 4% poor and 7% never experienced. The analysis is graphically represented in Figure 6.75.



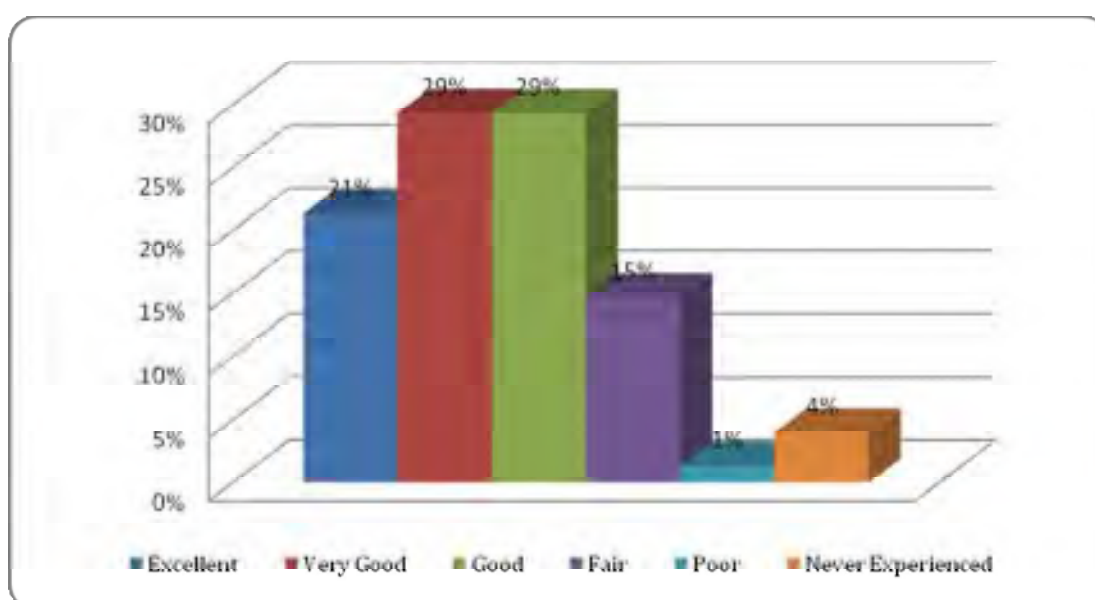
**Figure 6.75: Level of Satisfaction with Technical / Community Support**

Community participation is very crucial to the growth of any open source ILS. Behind the success of a particular OSILS lies shared knowledge and collaborations of the participating community. Koha has a robust community of users and developers surrounding it to provide solutions to technical as well as functional issues. Koha performs all the essential functions required for a library and is also supported by the community in a larger way. Koha has an active user community in other parts of the world. Indian users of Koha contribute to and/or benefit from user forums and this user community is effective in problem-solving and trouble-shooting of new and existing users of Koha in India. Some proactive Indian users of Koha have taken initiatives to promote and distribute Koha. Koha also organizes a number of training programmes. These initiatives have been encouraging more libraries in adopting Koha world wide.



### ***Documentation***

When the question on level of satisfaction of documentation available on Koha was checked the responses were satisfactory and an equal (29%) number of respondents stated that Koha's documentation availability was 'very good' and 'good'. However 21% of the respondents declared that it was 'excellent'. Few had different opinions and they rated it as 'fair' 15%, and 'poor' 1%. There are few respondents (4%) who have not seen or used the documentation available for Koha software. Graphical representation of the analysis is depicted in Figure 6.76.



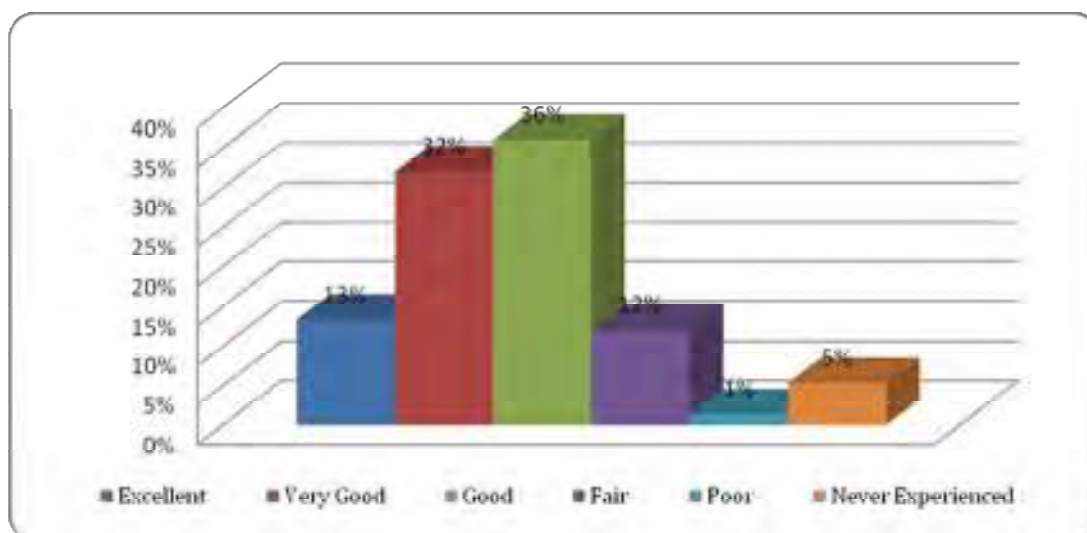
**Figure 6.76: Level of Satisfaction with Documentation**

Availability of quality documentations in public domain is one of the major factors which enhance the rate of adoption. Koha provides simple and user friendly documentation such as guides on implementation and tutorials. Koha requires much better and widely available documentation in Indian language to suit needs of all type of Library professionals and users as well.

### ***User's Response***

To collect details on how users treat the use of Koha software in their libraries respondents were asked to represent their level of satisfaction on their user's response. The

high response was for 36% as 'good' followed by 32% as 'very good' and 13% as excellent. The user's response for 'fair' was 12%, 'poor' 1% and never experienced 5%. The analysis represented in graphical format in Figure 6.77.

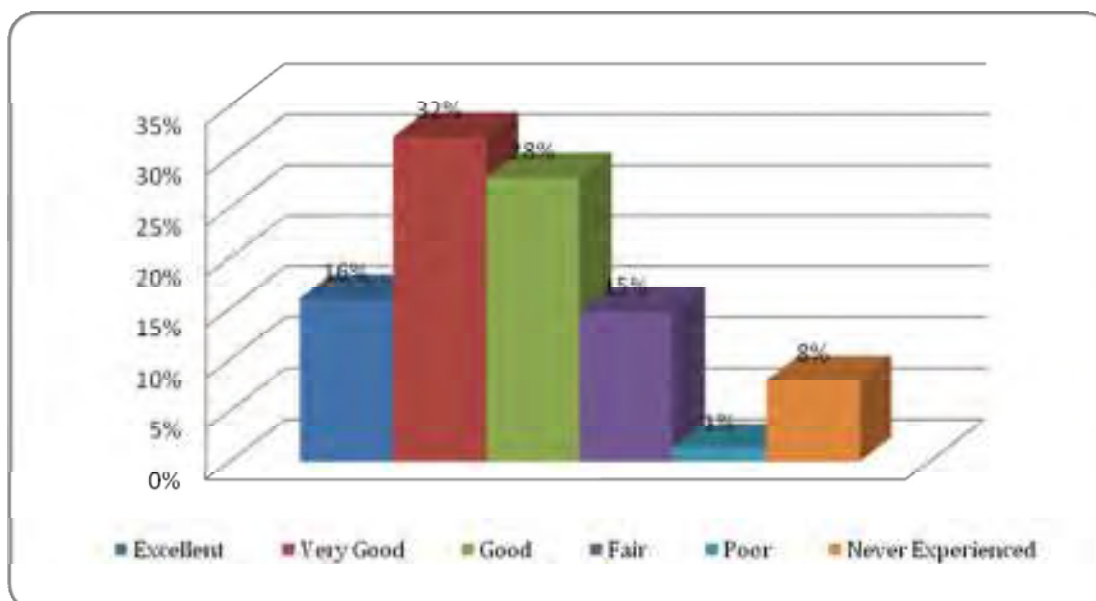


**Figure 6.77: Level of Satisfaction with User's Response**

Few percentage of professionals still feel that documentation of Koha software is not sufficient to have full control over the software. But the response rate of users shows that they are highly satisfied with the software. This could be due to the user friendly browsing facilities with simple and advanced search features, availability of checking the individual browsing details, reservations etc., options for suggesting new books of their interest, getting reminders for their overdue books through email, SMS alert and other similar features and functionalities.

### ***Upgrades and Enhancements***

The survey asked respondents to rate their level of satisfaction with the updations and enhancements that have taken place with the software. While less than 35 percent of respondents checked 'very good' (32%) and 'good' (28%), an equal percentage (15%) of respondents checked 'excellent' and 'fair'. Surprisingly, the responses received for 'never experienced' is comparatively high as 8% of the respondents had no knowledge about it. The representation for 'poor' was only 1%. The result of the analysis is graphically represented in Figure 6.78.

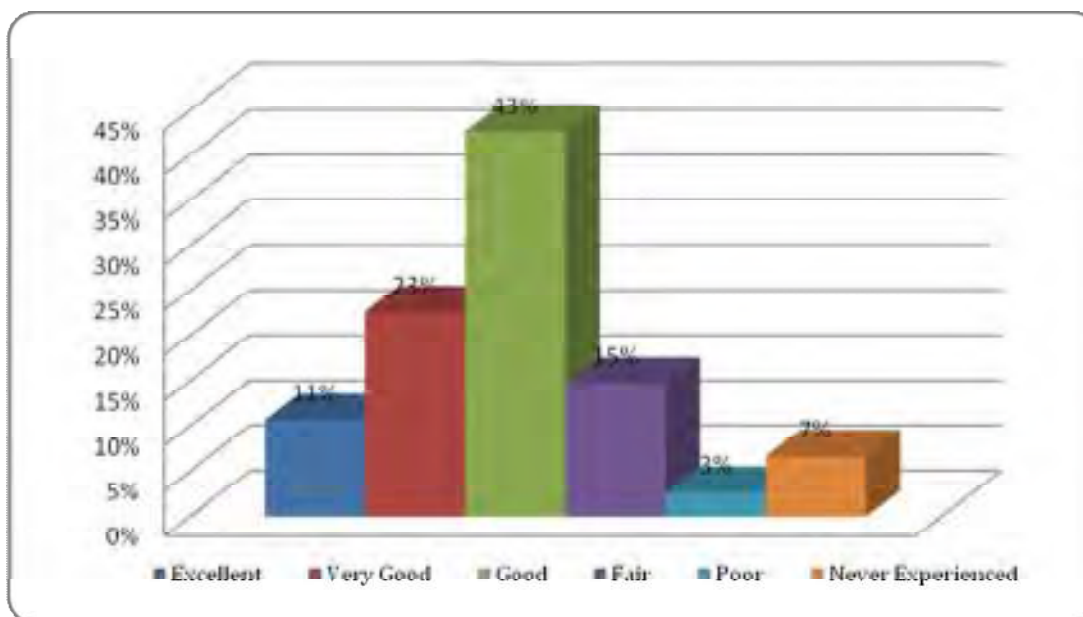


**Figure 6.78: Level of Satisfaction with Upgrades and Enhancements**

Koha frequently updates its features and facilities. There are professionals around to solve and enhance the activities of Koha through forums, in-person etc. There are commercial companies in India which provide Koha services among other activities. These companies provide customization based on the distribution of Koha. Study shows that up to certain extent respondents are satisfied with the updations and enhancements of Koha software.

### ***Design and Coordination of Statistical Reports***

Respondent were asked to rate the potentiality of the modules available in Koha for reports and statistics generation. The percentage chosen by the represented for 'excellent' and 'very good' is 11% and 23% respectively. Majority of the respondents agreed that design of statistical report and its coordination is good and a significant number of respondents shared that these modules are 'Fair'. Graphical representation for the result of the analysis is showed in Figure 6.79.

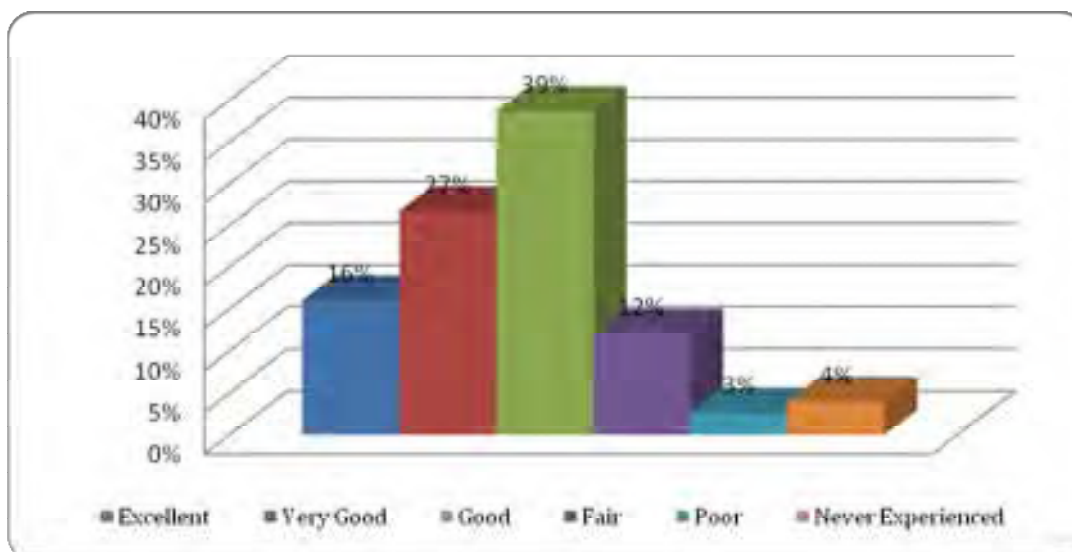


**Figure 6.79: Level of Satisfaction with Design and Coordination of Statistical Reports**

Koha has pre-defined modules to generate and provide various statistics and reports. Koha's report modules are designed mainly in four areas to generate various reports such as custom reports, circulation reports, statistics reports and reports dictionary. Design and coordination of modules for generating reports and statistics on acquisition, catalog, shelving, patrons details, over dues, serials management or any list of data in the database needs to be improved in Koha.

### ***Managing Print Resources***

Users of Koha were asked to represent their level of satisfaction with the module available for handling print resources. The highest number (39%) of respondents appeared to be satisfied marking 'good' followed by 27% and 16% for 'very good' and 'excellent' respectively. Significant number of respondents at the rate of 12% represented it as 'fair' and 'poor' and 'never experienced' indicated insignificant number such as 3% and 4% respectively. Figure 6.80 shows the graphical representation of the result of the analysis.



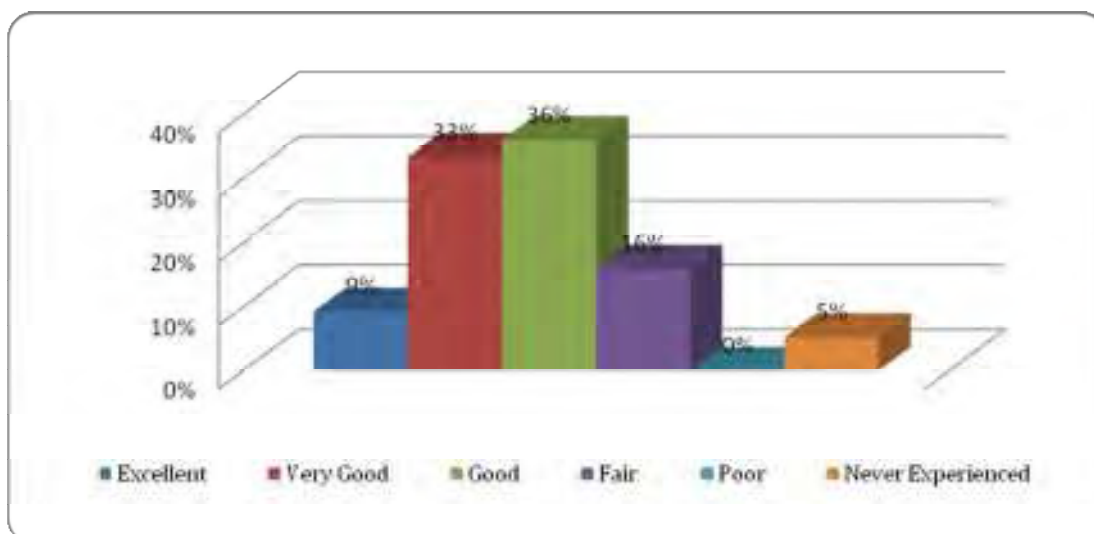
**Figure 6.80: Level of Satisfaction with Managing Print Resources**

Koha is one of the powerful open source library management that has tools and modules to effectively manage storing and retrieving information dealing with the printed contents. However, the result of the study shows that, there should be some initiative to customize the modules for accomodating print resources in a more comfortable and easy way.

### ***Managing Electronic Resources***

Koha users were asked to indicate their level of satisfaction in managing electronic resources. The response rate for the scales given was excellent, very good, good, fair and never experienced was 9%, 33%, 36%, 16% and 5% respectively. The anlysis is graphically represented in Figure 6.81.

Libraries are increasingly investing on electronic contents such as electronic journals and electronic books. Koha has limited options to control the activities related to electronic collections. The electronic resource management module of Koha facilitates access to electronic resources including e-books with full texts being available at local server and users can search all-books of all the publishers including the open access resources archived on the server.



**Figure 6.81: Level of Satisfaction with Managing Electronic Resources**

Koha can even display the cover page of the resources where users will have more visibility to the resource. Fortunately, nowadays most of the publishers provide the MARC or Excel records of their e-resources so that it can be directly imported into the software without much effort and investment. Hence, Koha necessitates better options to deal with different aspects of electronic contents

### **Transparency (Unrestricted Use)**

Installation of Koha software is very easy and requires less hardware support than any other full featured ILS. Koha facilitates more user friendly downloads with the availability of its source code and supports multi-user access created by working professionals in India. Koha also has provisions to assign permissions and privileges to an individual staff in a library to perform role based tasks on sets of rights.

### **Documentation**

Support of comprehensive documentation of Koha in manual and online format helps in solving day-to-day tasks of the librarian. Koha also has advanced inbuilt context based documentation facility.

## **Customization**

One of the major advantages of all the modules available in Koha is their adaptability to customize in many different ways to fit the needs of a particular library. Customised Koha features make it possible for widespread document delivery and current awareness services, which is, not easily possible with proprietary systems.

## **Suitability**

Even though Koha was designed for public libraries, is robust enough to be also used in academic and special libraries. Use of sophisticated and robust computer technology, open standards and easy to customize facility with a well-designed interface for both the library and user made Koha more popular among Indian libraries. Moreover, its strong community of developers and users attracts more attention from national and international libraries. Koha is a wonderful OA-ILS system with many attractive features, which can be easily adopted by all school libraries, public libraries and university libraries, irrespective of their number of holdings (Goudar, 2014). With integration of the powerful Zebra indexing engine, Koha became, scalable to support tens of millions of bibliographic records and thereby provides a good solution for libraries of all kinds including large academic libraries (Goudar, 2011). Koha has a dual database design, which makes it more flexible to work and use its database (Singh and Sanaman, 2012). Additional advantages include compatibility of the software with a wide range of software formats, standards and applications. Koha's capability in handling Indian languages and its active user community and participation make the software more suitable to Indian environment.

## **Sustainability**

Sustainability of OSILS depends on its cost of maintenance and community participation and developer support. Adaptability of the software on any type and size of the library and provisions to meet local needs by customization also enhances the sustainability. Support of commercial vendors also partially affect the sustainability of an OSILS.

## **Developer**

Koha was developed by a reputable company and is currently maintained by a team of software providers and library technology staff from around the globe (Egunjobi and Awoyemi, 2012). Koha has been designed to meet current and future requirements of any library. Each version of the software is superior to its older versions.

## **Community Involvement**

The community support and the number of installations for Koha software become more robust with each passing year. There is also an online community of users to discuss any issues and problems related to Koha usage (Egunjobi and Awoyemi, 2012). Kumar and Jasimudeen's study on adoption and user perceptions of Koha library management system found that Koha software is popular among the southern states of India and the number of Koha users in India is growing (Kumar and Jasimudeen, 2012)

## **Satisfaction Level of Users**

In the OSS ILMS category, Koha stands out with an impressive presence in terms of numbers and satisfaction levels of the users. Koha was also rated as the most preferred ILMS among the ones that indicated the choice of ILMS migration. (Hanumappa and et al, 2014)

## **Functional Features**

Koha has advanced functional features to support the activities of a library. Koha has more functionalities than ABCD, especially those connected with the "next generation library catalog" (Macan and et al, 2013). Koha has advanced features of the next generation library systems such as appearance of real time changes made in the local holding information or other system preferences, live circulation status, automatic server updation, compatibility on RDA, cloud based services, electronic resources management etc. Koha's OPAC is the most advanced and most innovative solution (Yang and Hofmann, 2010) and many of the OPAC options are easily accessible, and often just involve making a choice from a pull down menu (Dennison, 2011). KOHA's OPAC is very user friendly and has



classic features like automatic link to Google books, Browse shelf, pre/post search selection for limiting hits to select participating library, various filter options, etc. (Goudar, 2013). Koha supports hosting the software in cloud based environment so that the investment on server maintenance, physical infrastructure, manpower, etc. can be saved.

### **Standards and Protocols**

Koha supports more standards and formats and is an open source ILS with a wide community, which is to be considered for implementation. (Macan and et al, 2013)

#### **6.7.13. Major Libraries Using Koha**

Some of the major libraries in India using Koha open source ILS are : Synthite Industries Ltd., Kerala; Indian Institute of Science Education and Research (IISER), Mohali; Dr. V. N. Bedekar Institute of Management Studies, Maharashtra; Mahatma Gandhi University (MGU), Kerala; IEC University , Himachal Pradesh; Lekshmipuram College of Arts and Science, Tamil Nadu; Ashoka Trust for Research in Ecology and the Environment (ATREE), Karnataka; Cochin University of Science and Technology (CUSAT), Kerala; Chinmaya Institute of Technology, Kerala; Jaswant S Kanwar Library of The International Crops Research Institute for the Semi-Arid-Tropics (ICRISAT), Hyderabad; School of Legal Studies, Cochin University of Science and Technology (CUSAT), Kerala; South Asia Institute of Advanced Christian Studies (SAIACS), Bangalore; Government First Grade College for Women, Mysore; Symbiosis International University, Pune; St. Stephen's College, Kerala; Pillai College of Arts, Commerce & Science, New Panvel ; Gurudas College, Kolkata; Nehru Arts and Science College, Kerala; Department of Ship Technology, Cochin Science and Technology (CUSAT), Kerala; Lokmanya Tilak College of Engineering, Mumbai; Mar Baselios Institute of Technology and Science (MBITS), Kerala; Mysore University Library, Mysore; O.P. Jindal Global University, Sonipat; Knowledge Services of Advinus Therapeutics Ltd., Bengaluru; Vaishnavi School of Architecture and Planning , Hyderabad; Vijnan Institute of Science and Technology (VISAT), Kerala; Asian School of Business (ASB), Kerala; Rajiv Gandhi University (RGU), Doimukh; Chitkara University, Himachal Pradesh; Indian cardamom Research Institute (Spices Board), Kerala; Indian Institute of

Technology Mandi (IIT Mandi), Himachal Pradesh, Sirohi District Institute Library of Azim Premji Foundation, Rajasthan; Institute for Financial Management and Research (IFMR), Andhra Pradesh; British Library, Hyderabad; Indian Institute of Space Science and Technology (IIST), Kerala; Indian Institute of Management (IIM Ahmedabad), Gujarat; Gogte Institute of Technology (GIT), Belagavi; Environmental Management and Policy Research Institute (EMPRI), Bengaluru; Christ Junior College, Bengaluru; Angadi Institute of Technology and Management (AITM), Belgaum; Federal Institute of Science and Technology (FISAT), Kerala; University of Calicut, Kerala; Department of Mathematics, University of Calicut, Kerala; CSIR-National Institute of Science, Technology and Development Studies (NISTADS), New Delhi; College of Engineering Vadakara (Formerly Co-operative Institute of Technology), Kerala; Sri Ramakrishna Mission Vidyalaya, College of Education, Tamil Nadu; Government Engineering College (GEC), Wayanad, Kerala; South Asian University Library, New Delhi; Central University of Kerala, Kerala, Assam University, Silchar; Azim Premji Foundation, Uttarakhand; Government First Grade College, Ramdurg, Belgaum; Kuvempu Institute of Kannada Studies, University of Mysore, Karnataka; Maharaja's College, University of Mysore, Karnataka; Indian Institute of Information Technology and Management-Kerala (IITM-Kerala), Kerala; Alliance University, Karnataka; Malabar Cancer Centre, Kerala; Learning Resource Centre (LRC) of Tech Mahindra Limited, Pune; Medanta Hospital, Gurgaon; Indian Institute of Science Education and Research (IISER)Bhopal, Bhopal; The Indian Public School, Chennai; Learning Resource Centre (LRC), Mumbai; Aryanet Institute of Technology, Kerala; Central University of Bihar, (Gaya Campus), Gaya; Central University of Bihar (Patna Campus), Bihar; National Environmental Engineering Research Institute (CSIR-NEERI), Nagpur; Goa University, Goa; SNDT Women's University (Juhu Campus), Mumbai; Tumkur University, Tumkur, Karnataka; Model College, Mumbai; E-Books Digital Multimedia Library, Pune; National Institute for Interdisciplinary Science and Technology (NIIST), Kerala; Rajiv Gandhi University of Knowledge Technologies, Hyderabad; USM-KLE International Medical Programme, Karnataka; Indian Institute of Information Technology, Design & Manufacturing (IIITD&M), Chennai.

#### **6.7.14. Promotional Activities**

The following are the government agencies in India identified to be promoting Koha. They organize many familiarization programs also.

1. NRCFOSS Project (National Resource Centre for Free/Open Source Software)
2. Government of Kerala
3. NISCAIR
4. DRTC

Development of Koha Live CD projects such as LibliveCD (Dr. A.R.D. Prasad, DRTC, Bangalore), KOHA GSDL Integrated Live CD (Sourceforge.net), Koha Live CD (OSS labs) etc. are very helpful for Koha installation. The website named OSS4LIB serves as information hub for library community to get information on open source developments and activities.

#### **6.7.15. Commercial Service Providers**

Availability of more support service providers makes Koha popular in India. There are many commercial companies in India, which offer support for installation, maintenance, training, and customization of Koha software. Following are the registered commercial firms in India for Koha support listed in official Koha website (<http://koha-community.org/support/paid-support/country/#ind>). Some of the leading commercial service providers in India to implement and maintain Koha software is listed in Table 6.6.

Apart from the above registered commercial firms, there are a number of other local companies that provide contract services in Koha software for installing, maintaining, migrating, customizing at a reasonable charge such as DELNET, Anant Corporation, Mumbai; Rapidradio Ahmedabad; OSS labs Bangalore; Grandure Technology Chennai, OrisysIndia Consultancy Services Trivandrum, KELRON Trivandrum etc.

**Table 6.6: Major Service Providers on Koha Software in India**

Sl No	Service Provider	Address
1	AU-KBC Research Centre <b>Contact:</b> Sanjeev Kumar Saini, Arunkumar.S	MIT Campus of Anna University, Chromepet, Chennai-600 044, TamilNadu, INDIA Work Phone: 044-22232711 / +91-9840214554 Email: <a href="mailto:koha@au-kbc.org">koha@au-kbc.org</a> / <a href="mailto:info4all@au-kbc.org">info4all@au-kbc.org</a> Website: <a href="http://koha.au-kbc.org.in/">http://koha.au-kbc.org.in/</a>
2	Avior Technologies Private Limited <b>Contact:</b> Mr. Abhishek Kumar Shaw	Sukantanagar, Secor-IV Salt Lake Kolkata 700098 West Bengal, India Phone: +91 8583963471 Email: <a href="mailto:mail@aviortechnologies.com">mail@aviortechnologies.com</a> Website: <a href="http://www.aviortechnologies.com/">http://www.aviortechnologies.com/</a>
3	Bengal Library Association <b>Contact:</b> Joydeep Chanda	P-134, C.I.T Scheme-52, Kolkata, West Bengal- 700 014, INDIA Phone: +919432298746 Email: <a href="mailto:blacal.org@gmail.com">blacal.org@gmail.com</a> Website: <a href="http://www.blacal.org/koha.html">http://www.blacal.org/koha.html</a>
4	Eclat Engineering Pvt Ltd <b>Contact:</b> Mr. Harendrasinh Gohil	E-212 Titanium City Center Anandnagar Road Ahmedabad - 380015, INDIA Email: <a href="mailto:info@eclateng.com">info@eclateng.com</a> Website: <a href="http://www.eclateng.com/">http://www.eclateng.com/</a>
5	Ecole Solutions Pvt Ltd <b>Contact:</b> Mr Venkatesh L S	Ecole Solutions Pvt Ltd Level 3 Brigade Business Suites Jayanagar 2nd Block, Ashoka Pillar Bangalore- 560011, INDIA Phone: +91-80-26571555 / +91 9686576695. Email: <a href="mailto:info@ecoleglobal.com">info@ecoleglobal.com</a> Website: <a href="http://ecoleglobal.com/">http://ecoleglobal.com/</a>
6	First Ray Consulting <b>Contact:</b> Vikram	6 Akshay Sankul Complex, Hanuman Nagar, Off Senapati Bapat Road,

	Zadgaonkar	Pune, Maharashtra– 411016, INDIA Phone: +91 20 24345693 / +91 93702 28262 Email: <a href="mailto:info@firstray.in">info@firstray.in</a> Website: <a href="http://www.firstray.in/">http://www.firstray.in/</a>
7	IndServe InfoTech Pvt. Ltd. <b>Contact:</b> Sudhir Gandotra	R-10, 3rd floor, Khirki Extn Malviya Nagar New Delhi – 110017, INDIA Phone: +91 98101-20918 / +91-11 26014670 / +91-11 26014671 Email: <a href="mailto:koha@openlx.com">koha@openlx.com</a> Website: <a href="http://www.openlx.com/">http://www.openlx.com/</a>
8	Informatics (India) Ltd <b>Contact:</b> Amit Gupta/R Sunil Kumar	No 194, R V Road P B No 400, Basavanagudi, Bengaluru, Karnataka – 560 004, INDIA Phone: +91-80-40387777 Fax: +91-80-40387600 Email: <a href="mailto:info@informindia.co.in">info@informindia.co.in</a> Website: <a href="http://www.informindia.co.in/iil_productServices.htm#Koha">http://www.informindia.co.in/iil_productServices.htm#Koha</a>
9	Jivesna Tech Pvt. Ltd <b>Contact:</b> Utsav Rai, Vikrant Malik	A/209, Sector-17, Vashundhara, Ghaziabad Uttar Pradesh- 201012, INDIA Phone: +91-0120-4266526 / +91-8860611657 Email: <a href="mailto:utsav@jivesna.com">utsav@jivesna.com</a> / <a href="mailto:info@jivesna.com">info@jivesna.com</a> Website: <a href="http://www.jivesna.com/">http://www.jivesna.com/</a>
10	Nucsoft OSS Labs <b>Contact:</b> Savitra Sirohi	602A, Times Square, Wing - A, Andheri - Kurla Road, Andheri (East), Mumbai, Maharashtra - 400 059, INDIA. Phone: +91 22 3208 0161 Fax: +91 22 6692 0569 Website: <a href="http://www.osslabs.biz/koha">http://www.osslabs.biz/koha</a>
11	OpenLX Inc. <b>Contact:</b> Sudhir Gandotra	A-72, Shivalik New Delhi – 110017, INDIA Phone: +91-93124-65666 / +91-11-26684440 / +91-11-26684441 Email: <a href="mailto:sudhir@openlx.com">sudhir@openlx.com</a> Website: <a href="http://www.openlx.com/">http://www.openlx.com/</a>

There are also opportunities for getting free support from organizations and individuals. Koha community is also highly supportive in getting quick and easy responses. There are also numerous experts and consultants of Koha software who act individually and provide consultancy or support services for cost or on voluntary basis.

#### **6.7.16. Koha is Most Preferred Among OSILS**

Application of OSILS in libraries empowers individuals to share their knowledge and experience with the rest of the world without any commercial motivation. It is a tendency now seen in Indian libraries as revealed by the survey and also the literature that libraries are replacing their commercial ILS with OSILS due to the common reasons of high cost for installation, maintenance, updates and licence and also poor support, lack of frequent developments and lack of flexibility of commercial software. Many libraries have implemented OSILS in their libraries successfully and many are preparing to adopt it, as they are looking for a single solution to meet all their requirements with an affordable budget. Koha is found to be more matured than any other OSILS with full access to its source code and adequate support from a large community worldwide. Over-all responses of the survey indicates that Koha satisfies all the major functional requirements of a perfect ILS. The observation and analysis of the perceptions of library professionals in India revealed that the majority of academic, research and public libraries equally support the adoption of OSILS in libraries and among them. Koha OSILS is found to be most preferred software. Koha seems to have a wider user community and more number of installations in India compared to other OSILS software. Koha is also proposed as the best suitable for Indian scenario due to its popularity among Indian professionals. Software providing more facilities to automate different activities in library and information centres may be treated as most suitable for libraries – as compared to those having limited facilities. (Lihitkar and Lihitkar, 2011). Koha is most popular and mature OSILS and is growing very fast and found to be more stable and vibrant than any other OSILS. Koha is also getting commercial support from Indian service providers to help the libraries in its installation, maintenance, customization etc. including running the server in a cloud environment. Nucsoft (OSS Labs unit), Bangalore based company and OpenLX Technologies Pvt. Ltd (Formerly OpenLX Inc.) a New Delhi based company are the leading service providers in India.

## **6.8. Feedback From Library Experts Through Personal Interview**

In addition to online questionnaire, separate personal interviews were also conducted to get the detailed and personal views of the experts on open source ILS. Interview with the librarians from different organizations helped to gather rich information and provided an insight into the process of selection of open source ILS for libraries. The interview supports the result of the study and stressed the fact that library professionals are not completely proficient in using OSILS and needs to be trained with its implementations and adoption. There were five questions asked during the interview and is represented in Appendix IV. The summary of selected respondents for each question is as follows.

### **Q1. Views on Sustainability of OSILS in Indian Libraries**

Sustainability, according to one respondent can be confirmed only by reflecting on alternatives as well as context and carefully considering the strengths and weaknesses of any OSILS. This means, either we have to go for open source in library automation or we need to go for standard software of commercial software vendors. So we have to view both positions and the strengths and weaknesses of open and commercial software. Another respondent from one of the National Institute of Technology mentioned that now-a-days, there exists many commercial firms and library professionals to modify the codes of software like (Koha) as per requirements of libraries hence there is no question on its sustainability and the technical manpower in this field will increase more and more in the future. Another response from National Science Library quoted that “In India, there is a definite shift from proprietary ILS to OSILS. However, the pace at which this shift is happening is far from satisfactory. Given the facts that LIS professionals are aware of the benefits of OSILS and we are seeing increasing migration from commercial ILS to OSILS, we should see OSILS operated libraries outnumbering the commercial ILS in the coming years. It is well known that OSS is sustainable with Linux being the best example on sustainability. So, that should be a concern for libraries too”. Yet another response says that OSILS are the future in library automation, especially in developing countries like India, where the cost of ILS is a major concern. An expert from Kerala University, Library Science Department considered that OSILS has a very good future in Indian libraries for various reasons. Cost is an important factor behind the lack of automation in many

libraries. A versatile proprietary ILS costs around 8-12 Lakhs which is beyond the capacity of many libraries. OSILS like Koha is available in live CDs, which can be installed on any number of systems without any license fee. We can do repeated trials before we buy. The workshops and training programmes that are being offered by various associations and institutions needs to be enhanced. Large amount of information created by experts on this area is available on internet. The OSILS will outperform proprietary ones not only due to cost but also quality. An expert, who has experience of around 10 years with OSILS, commented that community support, awareness and training programmes for users (patrons and library staff) on use of OSILS, commitment from professionals (librarians and programmers) to keep developing and adapting to new technologies being developed besides change of attitude (of management, staff and students) towards OSILS are the major key factors which enhances the scope of sustainability of OSILS in Indian libraries. Another expert believes that only mature OSILS will sustain in Indian libraries and maturity denotes several aspects including expert leadership, regular release of the software, good documentation, availability of source code in open source repositories, compliance to standards, wide user community, mailing system etc.

## **Q2. Best OSILS Suggested for Indian Libraries**

Most of the experts suggested Koha as the best suited for Indian libraries followed by NewGenLib software. Koha is the most suitable software indicated by most of them and is due to various reasons such as its strong community support, stability, much larger installations, big community at both national and international level, versatility, ongoing development, maturity, scale of development history, feasibility to meet all requirements, availability of packages in live DVDs, cost effectiveness, adherence to library standards etc. One of the NewGenLib expert compared the advantages of Koha and NGL as “NGL does not have as vibrant and as open a user community as Koha although the number of NewGenLib (NGL) users in India is sizable. From the experience of NGL users, there is widespread satisfaction regarding the free one-time support that they get when they face with problems even if they are not on AMC. Many users have benefitted because of this policy of NGL. NGL does not organize courses on NGL like the protagonists of Koha unless a library requests such courses. We have found that such courses are not cost-



effective. Instead, NGL organizes Adoption programs. In these programmes, a library that wishes to work with NGL agrees to a 48-hour schedule (4 days of 12 hours each) in which NGL staff carry out an online installation on the library's server and client machines, take library metadata in a suitable format for it to be converted to MARC-2 format, provide basic training in metadata creation, and system administration. This service is entirely free and enables the library to quickly install and begin working with NGL. Any further training required is then offered on payment".

### **Q3. Suggestion for Additional Features or Characteristics or Customization**

When the question of need for additional requirement is asked, most of the experts said, Koha has attained maximum development in the contemporary library environment. However they reminded that additional features is a matter of requirement, imagination and innovation. Nevertheless, one respondent indicated that Koha has few opportunities of customization like incremental fine, online purchase suggestion restrictions, some in acquisitions etc. Another expert identified the need for further development in serials control system to meet challenges faced in serials management and article indexing option. One of the experts using NGL commented that "a cloud-based version of NGL is being developed and in all probability be offered to NGL users and the team has a few but well paid developers who take full responsibility, both for trouble shooting and new development, testing and deployment"

### **Q4. Reasons that Hinder the Adoption of OSILS**

There are various reasons indicated by different experts, which hinder the professionals in adopting OSILS. One respondent's comment is "Our education system unfortunately is not equipping students with the necessary skill sets and knowledge required to handle OSS". Another expert says "It is a psychological fear factor. Use of Linux has not become very common. GUI flavors are yet to become more commonly used by all". Another expert commented as 'technophobia' where responsibility that may turn into a burden at times and changing the mindset that has been adjusted to commercial software. The major reasons represented by most of the experts are lack of technical/trained manpower as well as confidence, Weakness of top library authority in decision making

process, perception of lack of maturity, lack of awareness, lack of training, lack of hardware, lack of expertise, lack of expert manpower to handle and troubleshoot OSILS, lack of technical support etc.

#### **Q5. Recommendations/Suggestions to Improve the Rate of Adoption of OSILS**

Experts suggest at least new emerging libraries must start with OSS and small libraries must switch over to Koha with community support, which is not very difficult. Also, need to equip/train/teach the students. It is required to put in place policies that mandate implementation of OSILS. Another suggestion indicated by a senior professional says "study programs such as MLIS should properly teach OSILS to students and there should be training programs available which are not very expensive so that library professionals who do not at present have the knowledge of OSILS, could get themselves trained. At present training programs are available from NISCAIR which is very expensive and unless funded by the organization, it is cost-inefficient. Other workshops training programs are also not up to the mark". Suggestions were also made to have more literature, more workshops, more awareness sessions and more collaboration. Another suggestion from an expert says that "introduce librarians to OSS, give proper training and education, teach how to select appropriate hardware, collaborate with friends and experts".

#### **6.9. Major Findings**

Adoption and use of OSILS have changed the landscape of library automation process everywhere. The paradigm shift of large-scale libraries from commercial ILS to OSILS is signifying the booming progress of open source movement. Indian library professionals are interested in adopting OSILS for their libraries because of its tremendous advantages in managing information and introducing innovative services with minimal cost. OSILS comes-into focus as a tool for libraries to automate their libraries in a cost effective manner, where libraries experience dissatisfaction with their legacy proprietary system due to poor support from the vendors, expensive maintenance and updation charges, customization inefficiency, and inflexibility. The major findings of the study are as follows:

1. The survey conducted for the study revealed that rate of adoption of ILS either in commercial or in open source stream is significantly low in most of the North East States of India. In the case of most of the East Indian and North Indian states, the rate of adoption of any ILS is intermediate. However the States of West India and South India have well recognized the importance of automation through ILS and adopted these packages.
2. Out of the total respondents investigated, overwhelming majority of the respondents were males. Data revealed that there was a gender difference between male and female respondents with respect to the data collected, hence assumes that male professionals are inclined to technological innovations. Female professionals should be encouraged to use library automation systems.
3. Results of the study on age group of the respondents show that large numbers of respondent are in the age group of 31-40 years of age in the sample, which shows that the young and technically matured professionals are working more on ILSs and are keen to adopt innovative technologies. It is also evident that very young respondents are also shouldering the responsibility of using ILS in their libraries.
4. The study found that ILS is being adopted by all types of libraries; however the types of libraries like school, public, non- profit institute and corporate libraries have given only little emphasis on adoption of ILSs. Larger libraries like university, college and special or research libraries are quickly and efficiently adopting technological changes in their libraries.
5. The data collected also indicates the fact that libraries ranging from low to high collections have adopted an ILS for the functions and services and majority of the libraries have a collection of less than fifty thousand. However the size of the collection of the library does not have any impact on adopting an ILS.
6. A minimum number of technically proficient professionals is very important to handle the activities of libraries but this is often lacking. Study found that majority of the responded libraries did not have minimum number of qualified professionals to

perform their activities and services. Further, lack of sufficient number of semi professionals and supporting staff hinder the activities associated with the technological advancements.

7. It is found from the study that different libraries are using different ILS of indigenous or foreign origin to manage their house-keeping operations. Libraries use commercial/proprietary, free/open, in-house/individual developed software for automation. The adoption rate of commercial/proprietary ILS is more than double when compared with open source ILS. The rate of adoption of software on open source, in-house and developed by others categories are found to be limited in Indian libraries.
8. It is seen that the trend of ILS adoption has been highly progressive in recent years. Moreover, there is a drastic uplift in the rate of adoption of open source ILS also during the last decade among Indian libraries and the major reason would be enhancement in the rate of commercial technical support.
9. OSILS has created a promising atmosphere for libraries to compete with the unaffordable financial involvement in purchase, license and up-gradation fee of commercial software. There is a positive attitude towards adoption of OSILS from small to voluminous libraries indicating greater awareness of OSILS. Libraries that adopt OSILS can make use of the software after customizing it according to their requirement. The survey revealed that majority of the respondents were aware of OSILS and many of them were exploiting it, which shows the popularity of OSILS among the library professionals.
10. There is no lacuna in realizing the benefits of using OSILS in Indian libraries and it is clear from the analysis that majority of the respondents support the adoption of OSILS in Indian libraries. It is an opportunity for LIS professionals to introduce newer and customized services, cost effectively.
11. The analysis shows that Koha has become very popular and is getting constant support from the user community in India. It also found that many university libraries

and college libraries have successfully adopted Koha for their library management. Also Koha has the ability to be an effective OSILS to cater to the needs of small libraries to libraries with very large collections. It was also noticed Indian library professionals expressed positive sentiment towards on adoption of Koha.

12. From the analysis data it is seen that majority of the respondents answered, that team of library and software experts are responsible for writing the documentation for OSILS. However few respondents remarked that the documentation must be prepared by library professionals alone. It is seen that in either of the answers the involvement of library professionals is vital which at the same time reminds the professionals to acquire concrete and extensive knowledge on technology. Documentation is one of the major issues associated with the adoption of OSILS and availability of poor quality documentation discourages the OSILS as option of choice and simplified documentation is required for customization and data migration.
13. The decision on the right software determines the success of library automation. The people involved in selection should have enough knowledge of how library functions and services can be rendered to the users according to their ever changing demands. An equal number of responses were received on the choice of key person in selecting the library software as the head of the institution as well as librarian. However, in reality, the process of selection and implementation of a software requires the confluence of librarian and IT experts to make the application self sufficient and effective. Library Advisory Committee, which is a team of librarian, head of the institution and IT experts also, has a significant role in making decision on ILS adoption.
14. Survey to measure the perceptions of respondents in adopting OSILS in Indian libraries revealed that majority of the respondents expressed lack of sufficient technical knowledge to install and maintain the OSILS. It is a major challenge in adopting OSILS. The other two reasons were shortage of skilled manpower to install and maintain the software and lack of technical support. Lack of promotional activities is another reason why respondents were hesitant to adopt OSILS. Competencies in implementing, maintaining and servicing OSS and OSILS are to be

acquired by LIS professionals. Though LIS professionals are oriented, insufficient technical support and inadequate training and opportunities are the main barriers in adoption and introduction of OSILS in Indian libraries.

15. The data analysis revealed that Libsys is the most used commercial software and Koha is the most used OSILS in Indian libraries. Moreover, Koha has a strong support of professionals through forums and community, which continuously provides news and information on the development of the software. The software such as SOUL, NewGenLib, SLIM, AutoLib, e-Granthalaya, VTLS (Virtua), Libsoft, EasyLib and Alice for Windows are the other major ILS software commonly used in Indian libraries.
16. The responses to the survey revealed that every year more libraries from India are adopting or migrating to an OSILS. Among the Free / Open Source ILS, Koha, NewGenLib and e-Granthalaya are the three popular ILS among the Indian libraries and are being chosen as alternatives to proprietary ILSs. Koha is identified to be most appropriate OSILS for any type of library. Lack of technical knowledge and support, shortage of skilled staff and lack of promotional activities are some of the major issues encountered in OSILS adoption. Libraries having staff with the necessary skills and experience to implement and customize the software can be highly benefitted with its vast potential. Use of OSILS is to be promoted as they pave the way for collaborative research and this can be achieved with the confluence of professionals for awareness programs, compiling documentation, training and guidance.
17. Study on commercial ILS users revealed that there are different software varieties available in commercial packages. LibSys, SOUL, SLIM, Autolib, Virtua (VTLS), LifSoft etc. are the major software used in Indian libraries. Software developed in-house, were also found to be extensively used in Indian libraries.
18. It is observed from the study that majority of users of commercial ILS were satisfied with features and functionalities, maintenance and backups, managing print resources, documentation, vendor support etc. A higher percentage of respondents were not fully satisfied with the documentation, customization, integrations and the

vendor support available with commercial ILS and a major percentage of respondents had never explored the modules for managing electronic resources.

19. It is revealed from the study that the circulation, OPAC and cataloguing modules of commercial ILS seems to be more efficient than the other modules as the respondents are highly satisfied with these modules compared to other modules. However, in the case of OSILS, OPAC and circulation are the modules found to be more efficient.
20. The study indicated that a large percentage of the commercial ILS users have recognized the advantages of OSILS adoption in libraries as the software is available for zero cost. OSILS facilitates free customization according to the local requirements of the library which cannot be done with commercial one. However majority of the commercial ILS are not planning to adopt OSILS as they are satisfied with their legacy system. Difficulties in maintenance, lack of support from vendors and community, lack of in-house technical expertise, complex installation procedures, lack of reliability, lack of motivation from the management and organizational policies etc are the other issues which hinder the adoption of OSILS.
21. Study revealed that managerial issues such as knowledge in open source technology, IT infrastructure, adequate library collection in-house technical expertise, motivation from the management and organization, experience and training, sufficient manpower etc. are also major concerns in adopting OSILS.
22. Study also found that one third of the total respondents of commercial ILS plans to migrate to OSILS because of reasons like cost effectiveness, flexibility, control over the data and software, easy to use and customize for local needs, technical/community support, control on the direction of development, shrinking budget / pressure from the management, demand from users, lack of vendor support etc.
23. It is indicated by the respondents that Koha is the most preferred library software among the commercial ILS users followed by NewGenLib, e-Granthalaya and ABCD. The reasons for Koha becoming more popular than any other software under

OSILS category include its frequently updated versions with improved features and functionalities, wide adoption, large and dynamic community of users, support services, user's satisfaction with modules, features, characteristics etc, support for national and international standards, web 2.0 features etc, attractive modules, interfaces and appearance, scalability, flexibility, and the ability to integrate with other technologies.

24. The study found that higher majority of commercial ILS users either strongly agree or agree with the statements OSILS requires more technical expertise than proprietary software
25. The study revealed that the overall responses of commercial ILS users show that implementation of OSILS are not more expensive than anticipated.
26. The study found that higher majority of commercial ILS users agreed that proper implementation and customization of OSILS requires exhaustive training.
27. The study revealed that the one third of the total respondents of commercial ILS agreed that OSILS is scalable solution to handle the house-keeping operations and can meet the needs of any kind of libraries.
28. The study found that most of the commercial ILS users agree that the present OSILS solutions are capable of meeting the current and future demands of any library
29. It is revealed by the respondents of commercial ILS users that OSILS products are developed over many years in a collaborative manner and are updated frequently hence can have more advanced and updated features
30. It is clear from the study that a higher majority of the respondents from commercial ILS users agreed that the entry of OSILS had a positive impact on the automation process as the availability and supports of OSILS in all levels of library operations alike developed commercial software. Hence it has also increased the efficiency of the library activities and services and the respondents agreed that OSILS is rich in its functionalities and technical supports and user-friendly.



31. It is found from the study that OSILS gives financial benefit to its users however a higher percentage of the respondents agreed that the quality of documentations available on OSILS needs to be developed.
32. It is clear from the study that OSILS reduces the cost of adopting library automation software and it is possible to customize it to fit the needs of the library and these are the two important reasons for adoption of OSILS by users. Surprisingly, the wider adoption/support/online community of OSILS and the availability of source code in OSILS along with ease in installing, maintaining and modifying the software have also attracted many libraries to shift to OSILS. Freedom from vendor lock and availability of source code along with quality of documentation drove some libraries to adopt OSILS.
33. It is revealed in the analysis of responses of OSILS users that the Serials Management and Acquisition are the two modules which require extensive customization to perform the activities and services related to it. It is also found that the design of the MIS Report module of the OSILS is commonly not as streamlined as it could be.
34. The level of satisfaction of OSILS users with the advanced features contributing to the efficiency of the software such as installation, database maintenance, backups, features and functionalities of modules, customizations and integrations, housekeeping operations, report generations, technical and community support, availability of documentation, responses of the users, upgrades and enhancements, design and coordination of statistical reports and managing print and electronic resources are found to be highly satisfactory.
35. It is found from the study that training on OSILS undergone by the library professionals in India is encouraging and further they took efforts to organize programs like workshops, training programs, lectures etc. to enhance awareness among the professionals thereby empowering them to become self-sufficient to adopt OSILS instead of always relying on commercial vendors for installation and implementation.

36. It is clear from the study that implementing an OSILS indirectly creates opportunities for library professionals and in-house technical personnel to explore and contribute to the development process. Analysis shows that staff with certain amount of technical expertise within the library can routinely perform support, implementation and basic maintenance of the software.
37. It is found from the study that higher majority of OSILS users expressed their interest to stick with the OSILS being used which shows that once the advantages and functionalities are realized, then the chance of switching over from OSILS to commercial ILS is very low.
38. It is found from the analysis that most of the respondents agreed that the fact that more libraries in India are switching over to OSILS is strong evidence which reveals a continued interest among the library professionals to adopt or migrate to OSILS.
39. It is clear from the response of OSILS users that majority of them experienced support from library professional organizations and Government and consider such support as advantages of OSILS.
40. Koha necessitates better options to deal with different aspects of print and electronic contents.
41. Based on the positive responses received from the respondents on OSILS, the indisputable facts identified can be summarized as follows:
42. More libraries in India are switching to OSILS
43. Application of OSILS should be part of the academic curriculum
44. Support on OSILS has increased from both Library professional organizations and Government
45. Library fraternity should be involved in conducting training programs and workshop

46. Library professionals should have more opportunity to attend free awareness and training programs on OSILS
47. High quality documentation on OSILS should be available in the public domain
48. OSILS provides significant economical and technological benefits
49. Application of OSILS in libraries leads to greater innovations and collaboration among the communities
50. Application of OSILS in libraries increases completion among service offering
51. Application of OSILS in libraries facilitate efficient use of resources across the country
52. OSILS are better choice for libraries to adopt
53. OSILS enhances the technical and technological expertise of library professionals and develops new skills
54. Adoption of OSILS helps sharing of knowledge and skills
55. OSILS are flexible and adaptable for all types of libraries
56. OSILS gives more control over data and software
57. OSILS are more suitable for long term services compared to proprietary systems
58. Indian libraries should consider consortia model for wider adoption of OSILS
59. Indian Libraries should have customized versions of single OSILS which can be used for any type of library
60. Indian Libraries should have an OSILS to support various Indian scripts
61. Professionals and professional associations need to help the individual libraries for installation, migration, customization, maintenance etc free or by charging nominal fee

62. The analysis of the study revealed that there is a drastic rise in the rate of adoption of Koha software during the last decade among Indian libraries. Adoption of Koha software was not immediate in the beginning and the rate was slow till 2006. The scope and popularity of Koha software has grown tremendously with widespread use among Indian libraries during the last four years and has become a very successful OSILS compared to other software of its kind in Indian libraries
63. It is found from the study that rate of adoption of Koha software is very significant in academic and special or research libraries, however nonprofit, corporate and college libraries were observed to be having less number of adoption.
64. The result of the analysis confirms the ability of Koha to be an effective OSILS to cater to the needs of small libraries to libraries with large size of collections. Libraries of all types and sizes are beneficiaries of using Koha software.
65. Analysis of the respondent's experience shows that acquisitions and serials management modules are the two main modules apart from report generation in Koha that requires higher level of customization to accommodate more features and functionalities.
66. The study found that the level of satisfaction of Koha users with the advanced features contributing to the efficiency of the software such as installation, database maintenance, backups, features and functionalities of modules, customizations and integrations, housekeeping operations, report generation, responses of the users and managing print resources are found to be highly satisfactory. However, it is found that improvements are possible in some characteristics such as technical and community support, availability of documentation, upgrades and enhancements, design and coordination of statistical reports and managing electronic resources.

## Chapter 7

# CONCLUSION AND RECOMMENDATIONS

### 7.1. Conclusion

#### 7.1.1. Performance Factors

To provide quality services and to support the increasing demands of users, libraries are trying out various technologies, thereby confronting lots of challenges. Libraries are looking for affordable solutions to automate their library activities to meet the evolving requirements of library users. The library software market in India has become increasingly competitive and more volatile than ever. Now, it is a recognized fact that automation of library activities using suitable library software enhances its operations and services. Library automation is one of the key factors to increase the relevance and reputation of the library.

Many libraries in India are interested in exploring an affordable alternative to their current commercial automation software. However, even after two decades of the introduction of Open Source Software (OSS) for library functions and services many libraries in India are still functioning without any automation activities and the number is much higher in public and school libraries. Many libraries still follow manual and traditional system to control the house keeping operations and they have started adopting software solutions for automation in isolation and are neither connected to other libraries nor integrated with the resources. Many libraries in academic and research institutions have already started their automation projects, however, the application of ILSs are not completely explored. Nevertheless, significant number of libraries in India are utilizing ILS packages to handle the house-keeping operations of the library. Libraries are looking for new generation automation software before deciding on the economic factor. The study has been undertaken with the awareness that adoption and implementations of Open Source Integrated Library System (OSILS) is still in the beginning stage and most of the professionals are not much aware of the advantages, flexibility and functionalities of the

software compared to the legacy commercial or in-house systems. It is high time for libraries in India to stand up for the adoption of OSILS to automate their libraries.

To gain confidence on implementing OSILS majority of the respondents had gone through some kind of training or awareness programs and indicated that Koha is the preferred software they intend to implement. The majority of the respondents among the commercial ILS users agreed with the statements which highly recommend the adoption of OSILS in Indian libraries. The respondents agreed with the statements on OSILS such as requirement of more technical expertise, training and support and the characteristics such as cost effectiveness, features on meeting current demands, advanced features and functionalities, efficiency and user friendliness.

An effort on finding out the reasons for choosing OSILS as the automation software shows that the majority of the respondents found the ability of OSILS to cut the cost of automation and the facility to customize to fit the local needs as benefits of OSILS. Freedom from vendor lock-in, licensing fee and maintenance cost, ease in implementation and the wider support through the community also attracted many of the respondents to opt for OSILS. A major attraction for those who have sound technical knowledge in software was the availability of source code of OSILS. The result of the research study on the level of experiences on the functional modules of OSILS revealed that OPAC, Circulation and Cataloguing modules of OSILS seem to be more efficient as a majority of the respondents from participating libraries think they are excellent. However the modules for stock verification and serials management have got the highest rate of response in the category of 'Never experienced' which indicate the need for improvements. Also an attempt to compare the functional modules of commercial ILS with OSILS indicates that respondents are comfortable with the modules such as OPAC, Catalogue and Circulation of OSILS than that of commercial software.

Apart from the basic functions and features of OSILS, the overall responses of the users on some of the selected advanced features such as installation of the software, maintenance of database and backups, features and functionalities of modules, customizations and integrations, housekeeping operations, report generations, technical and community supports, availability of documentation, responses of the users, upgrades and

enhancements, design and coordination of statistical reports and managing print and electronic resources were found highly satisfactory. The majority of the respondents also agreed that OSILS allows the end user to build queries in more than one script and create multilingual interface so that the result of the search result can be displayed in more than one script.

OSILS offer libraries multidimensional functionality with limited cost and are competent enough to cope with commercial packages. The level of agreement with the statements on the advantages and functions of OSILS in Indian libraries such as OSILS should be part of the academic curriculum, support on OSILS needs to be enhanced, need for conducting training programs and workshop and to have more opportunity to attend, need for high quality documentation, and the advantages such as economical and technological benefits, flexibility, adaptability, long term services, customized versions, greater innovations and collaboration, service offerings, efficient use of resources and support of Indian scripts were highly recognized. OSILS has every possibility of tailoring the upcoming technologies such as Library 2.0 applications to add more value to the service. The research study also found that as a whole, Indian libraries are in the early phase of the adoption of OSILS compared to the impact on the overall library automation process, however there has been a growing interest among Indian libraries to adopt OSILS for automating their libraries in the recent past.

OSILS are the easy option for introducing and managing newer information services. According to the former Service Manager of OSS Watch, Metcalfe, performance and reliability are very important criteria for selecting software (Metcalfe, 2013). The popularity and customer support of the software package also needs to be evaluated before choosing. The software should have minimum modules to accommodate the library housekeeping operations and should support the metadata standards with all the administrative and user access options.

#### **7.1.2. Economic Factors**

The analysis of the perceptions of professionals irrespective of the type of software being used indicates that a high majority of them support the adoption of OSILS in libraries. Many of them agreed that they had experimented with the flexibility of the software on a trial basis and ceased without continuing. Many professionals are followers

of other professionals in terms of their decision in choosing software rather than becoming an innovator. Apart from the financial advantages, OSILS have many practical, functional and technological benefits in favour of discarding the traditional software, which prevent the process of automation. High degree of quality, flexibility, security and reliability makes OSILS to compete with the commercial or proprietary ILS in the market. Adopting OSILS reduces most of the technical, technological, administrative and socio-economic problems and issues associated with the commercial software.

The decision to switch over to OSS, as an economic solution has enabled Indian libraries to establish a web presence to their resources and services and it has greatly enhanced the visibility of their library to the outside world. Though the adoption of or migration to OSILS is happening, in reality, in Indian libraries, it has not yet significantly diffused particularly in the realm of public, cooperative and school libraries in India. Librarians in India are still learning the basic techniques and installation procedures to cope with the advancement of the technology and to adopt ILSs. Many of the professionals were not clear about the concept and advantages of OSILS in Indian libraries. They think that OSILS is free software which can be freely downloaded and tested. The majority of the respondents who are using any proprietary / commercial software are satisfied with the existing software as they do not have much financial concern and do not want to take risk of having software with no responsible vendor or support. The other three major issues affecting adoption of OSILS in Indian libraries are its difficulties in maintenance, lack of in-house technical expertise and the lack of motivation from the management or organization and their policies. Library professionals need to become aware of how OSILS can help improve the functions and services of the library in a most effective way without much financial implications and technical depth. The result of this research study revealed that OSILS are more cost-effective and flexible than proprietary ILSs which make Indian libraries to consider them for library automation compared to proprietary or commercial counterparts. Many commercial systems are available off-the-shelf. These systems observe standards for ILS. However, these systems do not always meet the needs of libraries (UNESCO, 2006). The major attraction of the adoption of OSILS is its capability to eliminate the need for the library to pay software licensing fees, annual maintenance fees and other installation charges. Numerous libraries are seriously looking for the adoption of



open source solutions as their ILS or replacement search tool as the commercial software is too costly. The result of the research study revealed a common attitude of the respondents towards the adoption of OSILS based on the cost effectiveness.

The study also revealed the facts that OSILS are economical and low cost solutions for libraries the implementation of the software has been enhanced and most of the library professionals in India are competent enough to adopt and implement OSILS. Consortia methods to adopt OSILS will reduce the time, staff requirement and implementation, maintenance and management cost. Hosting automation process on a shared basis substantially reduces the cost of implementation and risk of customization. The strongest argument for libraries adopting OSILS is cost effectiveness. However, there are areas where libraries have to make financial commitments. Ultimately, the decision to stick with a commercial ILS or to adopt or migrate to an OSILS is in not only its cost factor but also the qualities and advantages of the software in terms of its functions and features.

### **7.1.3. Sustainability Factors**

Considering the immense advantages of adopting OSILS in providing better services and functions, it is necessary to educate and promote the use of OSILS in libraries. Limited updates, lack of confidence, high cost involved in switching to other software and organizational policies preclude professionals to adopt OSILS. The situation is changing with the opportunities being available to learn and practice and due to increasing Government interest in adopting OSILS. Many available OSILS are establishing its sustainability in Indian libraries and becoming popular due to its large community of developers and worldwide community of users, thereby rapidly spotting and fixing bugs and errors.

The survey found that Indian libraries are encouraged to adopt OSILS for their libraries rather than proprietary or commercial software and the trend is more present in higher education sector where the usages of libraries are comparatively high. The most attractive reason for choosing OSS as ILS is the availability of the source code. The study found that continued adoption and development of OSILS prevails in India. There has been an upward movement in the number of libraries in India choosing OSILS as their automation software. Compared to OSS, commercial software may provide better value for

money and return on investments; however it is the decision of the individual to identify whether the OSS will be able to meet all their library requirements. So, it is very important to understand the limitations of the OSS before making the decision to adopt it, as it will not give any sort of assured support or warranty. Academic libraries have adopted the ILS more than corporate and non-profit libraries and the rate of adoption is higher in college libraries but very poor in public libraries in India. The study also noticed that more than one fourth of the total respondents were using OSILS in India and the adoption rate over time indicates that the years after 2008 witnessed more installations when the popularity of OSILS was in full swing and is expected to be more in the coming years. Very few respondents selected PhPMyLibrary and Evergreen Software, though they are extensively used in other countries. The survey revealed that LibSys comes first in the overall usage as a majority of respondents indicated in the commercial category where as Koha stood first among the open source category. SOUL and NewGenLib are the other two software which comes next to the above software under commercial and open source respectively. Few of the respondents have already started the process of switching over from their commercial system. A majority of the respondents agreed that entry of OSILS had a major impact on the proprietary ILS market as many of them decided to migrate to open source. Recently many public libraries have embraced the adoption of OSILS mainly Koha. Connemara Public Library in Tamil Nadu and other 32 District Central Libraries (DCL) in the State recently automated using Koha software. In Kerala, Government has recently decided to computerise all its affiliated public libraries under the Kerala State Library Council (KSLC) with Koha OSILS. Kerala State Central Library with approximately 5 lakh books in English, Malayalam, Hindi and Tamil in its collection is planning to changeover from a proprietary software to Koha. The progression of adoption is highly hopeful and impressive during last five years and has reached mainstream to compete with the proprietary system by achieving equivalent functionalities. The success and future of any OSILS depends upon many factors such as its adoption rate, frequency in updations, customer support, interest of the professionals etc.

Technical support for the software needs to be enhanced. Emergence of more and more commercial support to implement, customize and maintain OSILS may also enhance the rate of adoption. Creation of collaborative web pages like Wiki helps to enhance the

visibility of the software usage facilitating documentations, updating it instantly and sharing the ideas and experiences of individuals. Immediate solutions for a particular problem can be easily obtained by getting multiple options from individuals. Members will be informed of software updation and can monitor the page for changes and modifications.

#### **7.1.4. Technical and Technological Factors**

Although users of OSILS experienced difficulties with installation and incomplete documentation, they were more satisfied than users of proprietary ILSs. The study has revealed that male professionals are more occupied with technological innovations in libraries and among them professionals in the age group of 31-40 years are more attracted to library automation activities. Higher majority of the respondents opined that a team of library and software experts should write the documentation for any software to avoid the shortage of availability of quality documentation and at the same time the selection of suitable software for each library should be done either by the librarian or by the head of the institute and even some opted for library advisory committee as the final authority to decide the software.

Libraries can get support from vendors independently or even support from multiple vendors to get quality services on OSILS maintenance. Also, LibLime, a commercial Koha support developed proprietary version of Koha called Enterprise Koha in 2009 with some additional features and upgrades. To improve the quality of OSILS according to the individual requirements, there should be technical support from the experts, however most of the experts are charging for this purpose. LIS professional experts of OSILS themselves should organize promotional activities for the benefit of the new entrants in library profession.

#### **7.1.5. Customization Factors**

The present study also revealed that some libraries have chosen OSILS out of necessity and they are planning to get assistance for the same in many areas including the functional customization as they have not fully planned before selecting the software. It is clear from the data analysis that libraries take initiative to provide additional functionalities and services are not completely satisfied with the commercial system as the possibility for customization according to the local requirements necessitates additional expenses.

However, a good number of commercial users are planning to adopt OSILS. However, the modules for Serials management, Authority Control, Stock Verification and MIS reports are better in commercial ILS, which signifies the need for customization. Further, the study indicates that among these modules stock verification received a high rate of response for need on customization followed by Acquisition module. Collaborating with user libraries helps to develop standardization in customizations.

#### **7.1.6. Preventive Factors**

The biggest disadvantage to OSS pointed out by a majority of the respondents is the lack of technical support. The major potential drawback in libraries to OSILS includes lack of technical knowledge and shortage of skilled expertise to install and maintain, and the lack of technical support from the management or the software developers. The other major challenges of adoption of OSILS among Indian libraries needs to be considered are vendor support, data security and organizational policies.

The rate of implementation within the collection of less than fifty thousand is found to be high and one of the reasons for not automating the libraries in India is found to be the shortage of sufficient and skilled manpower among professionals, semi professionals and supporting staff. It is also realized from the study that only an insignificant number of LIS professionals are not aware on the OSILS in India and among the known professionals a higher majority highly support and recommend the adoption of OSILS in Indian libraries and has chosen Koha as the best suitable OSILS for Indian libraries and NewGenLib and e-Granthalaya as the other two choices next to Koha. Lack of technical knowledge to install and maintain the software is the biggest challenge which prevents the wider adoption of OSILS among the Indian libraries, though it is a cost effective solution with similar functionalities of a commercial one. However, shortage of skilled manpower to install and maintain and the lack of technical support to the OSILS also equally hinders the growth of OSILS. Less interest among the professionals to take initiatives also becomes a barrier to wide spread adoption of OSILS. The study made an attempt to find out the reasons why the growth of adoption of OSILS is comparatively slow though it is a most economic solution. The study found that majority of the commercial software users are satisfied with their commercial legacy system in the basic characteristics such as features and

functionalities, maintenance and backups and managing print resources. When compared to commercial systems, respondents found that cost effectiveness, flexibility, control and customization facility are the major attractions of OSILS at one side and its maintenance, requirement of in-house technical expertise and lack of motivation from the management are pulling them back from adopting OSILS on the other side. However some of the respondents showed their concerns on its scalability, availability of quality documentation, its requirement of more technical expertise in its customization and maintenance. It is found from the earlier studies that lack of training programs on OSILS is one of the major issues associated with the wide adoption of OSILS. It makes the implementation difficult with the limited organizational support with respect to high speed Internet connectivity, memory storage devices and hardware peripherals, etc. The level of technical knowledge needed to install and maintain the OSILS was a major drawback in Indian situation for its wider adoption.

Libraries in India still do not generally use international metadata and interoperability standards (e.g., MARC-21, Dublin Core, OAI-PMH) and it is believed that this puts them at a great disadvantage when it comes to sharing metadata and building union catalogues and networking. Since libraries are not networked and hence are handicapped in sharing costly bibliographic and full-text resources among themselves, it is important to provide software that would allow both library management and the creation of increased institutional open access repositories. In terms of library system localization, Asian languages are very different from, and much more difficult than, Latin-based languages (Zou and Liu, 2009). There are number of issues preventing adoption of OSILS in Indian libraries. There is also a longstanding conviction among the library professionals on commercial software vendors that the service provided by them as part of their agreement tends to be better than the solicited support of OSILS which enable them to stay away from the risks associated with OSILS. However, there are issues that can be solved through proper integration. Training or hiring technical expertise is the biggest challenge. Libraries have to make use of their own IT staff to get support service rather than any commercial agency or ILS vendor as also to handle the software, its maintenance, and upgrades. Though library professionals are interested in adopting them for their libraries, lack of technical support and effective

training for the customization and maintenance of the software prevents them from adoption, introduction, expansion and maintenance.

#### **7.1.7. Motivational Factors**

Study indicates that there is a progressive growth of number of workshops, training programs, conferences, seminars and creation of user groups and forums to promote the awareness on OSILS in Indian libraries, which motivates the professionals to adopt or migrate to OSILS. Training LIS professionals at regular intervals on new updates of OSILS may help to achieve precision in OSILS implementation. Convergence of counterparts should frequently take place to provide hands on training on installation and maintenance to get the professionals skilled and confident. The result of the research study in implementing and maintaining OSILS itself undoubtedly shows the enhanced self sufficiency among the library community. The rates of libraries approaching for professional help come down in the implementation of OSILS.

Training LIS professionals at regular intervals on new updates of OSILS may help to achieve precision in OSILS implementation. Further to support the adoption of OSILS the views of respondents on the features of OSILS indicate that the users greatly appreciate the facility of OSILS in customizing their display formats depending on local requirement, storing and retrieving of records in local /other Indian scripts and indexing and searching of records in local /other Indian scripts.

When questions were asked on whether they have a plan to switch over to commercial ILS from OSILS being used, surprisingly few respondents agreed that they were planning to migrate. The major reasons for the decision on migration were they could not find other software which is more suitable to their needs. The problems with existing OSILS such as difficulty in maintenance and upgrades, lack of technical support from the vendors and the lack of current development activities of the existing software etc. need to be addressed and the existence and developmental activities need to be addressed. Libraries wishing to adopt OSILS can find lots of support from the online community (Kamble and et al, 2012).

The possibilities of identifying and fixing the bugs are relatively very high in OSS because the source code is open to the examination of a vast community of professionals.

This encourages the security and stability of OSILS and makes the process of fixing the bugs faster than with commercial software, where we need to wait for the vendor's convenience. Collective access to interactive social platforms like wiki, community website, developer forum etc. helps in sharing and interacting with each other. Availability of vendor support in an affordable manner will also help the libraries that lack sufficient manpower. Many libraries choose to first test and then adopt the software and if there is assistance from professional friends or through a cloud mechanism to run such a test and try it free of cost, the popularity of the software may go high. These can also facilitate libraries to learn about the functionalities and facilities of that particular software, thereby set up the implementation in a better way.

#### **7.1.8. Sustainability Factors**

Koha is one of the full featured OSILS which has attracted majority of the respondents due to its cost effectiveness, software control, developments, ease of use, ability for customization, and community support from all over the world. The respondents demonstrated positive attitude on adoption of Koha OSILSs. The modules and features have proved to be more efficient among its kind and interface with self explanatory functional modules which demonstrate the maturity in design and developments. Koha has been widely adopted and supported by various libraries throughout India for the last two decades. Koha has a strong support of professionals through forums and community to take forward the development of the software. Kerala is the State from which majority of the respondents attended the questionnaire. Analysis shows that there was a drastic increase in the rate of adoption of Koha software during the last decade among Indian libraries. The statistics shows that penetration of Koha software is very significant in university, special and research libraries, however in college libraries, a low rate of adoption was observed. Data collected and analyzed indicates that Indian libraries have a trend where records on serials and Stock verification are maintained manually though the software provides devoted modules to perform the task.

Based on survey conducted among the Indian libraries, Koha, NewGenLib, e-Granthalaya and ABCD are found to be the most popular ILS among the OSS category and LibSys, SOUL, SLIM and Autolib are popular software among commercial software for

library automation. The study also found that there are several software in the commercial category with paid vendor support. Koha and NewGenLib are the two OSILS found with high popularity and interest in adopting or migrating to among the Indian library community. In this trend, Koha ranks above NewGenLib. BIREME's ABCD software is another OSILS that comes next. Though ABCD software is known to many professionals and is relatively new, only few had made any attempt to adopt it. The software would be more attractive and easy to use for those who have experience on CDS/ISIS and its other versions like WinISIS and GenISISWeb etc. However an experienced and expert library professional will have to be involved in selecting and customizing the software according to the requirement of the particular library.

It is observed from the study that Koha is extensively adopted by Indian libraries and the rate of adoption is more in university, special and research libraries. There was no sign of using Koha in public libraries; however, the recent news shows that there is a true spirit in public library's missions to selectively adopt Koha software for their libraries. Most of the libraries surveyed have supported the adoption of OSILS in Indian libraries and agreed that Koha ILS is the best suitable solution for Indian libraries with less customization. Based on the type and size of the library, commercial software facilitates pick and choose model category of software, however if a library desires to choose OSILS they have limited options as the number of software are limited. The same situation has been effected even in the availability of documentation also. Even with all these according to the evaluations from a wide range of respondents from different libraries in the country, the adoption rate of Koha software has steadily increased since the first version of the software was released in 2000. Moreover the software becomes a viable solution to perform all the functional activities of any type of library. The increased interest in Koha ILS encourages many libraries to switch over to it from their legacy costly proprietary system. A growing number of regional and state wise training programs and seminars / workshops significantly contributed to make the software one of the leading OSILSs in Indian libraries. It indicates their improvements in the OSILS in general and the Koha and NewGenLib Software in particular to suit in Indian libraries. Though there are many OSILS available in the software market, as far as the Indian libraries are concerned, where they have multi-linguistic resources, it is found to be agreed by majority that Koha software



can satisfy and serve the needs and requirements of all types of libraries such as academic, research or special, public, school, corporate and non-profit organization libraries. Stability, flexibility, functionality and customizability are the other major factors, which highly influence the adoption of OSILS in Indian libraries.

#### **7.1.9. Promotional Factors**

Staff of library must be computer and IT literate and must have basic ideas about automation software and the provisions should be made by the authority to update their knowledge. Professionals should be able to correct misconceptions and encourage the less technically experienced professionals to learn about OSILS. To adopt an OSILS, a library staff should have certain amount of technical expertise, adequate planning along with the availability of technical support. Upgrades of the software should be available when a library requires a new feature to serve the user. Face to face video or electronic training programs like webinars etc. can be organised. Creation of resource gateway for professionals which include information regarding OSILS applications, list of libraries using common software, customization updates, relevant literature on specific interest etc. enhances the rate of adoption of OSILS. There is a significant move from the side of government towards incorporating open source applications in procurement and development policies. Government's interest in pursuing the adoption of OSILS is also encouraging. The policy makers should recommend the usage of OSILS at least in Government organization as the same was did in Department of Technical Education, Kerala. Accessibility of tutorials and systematic demonstration of the installation and modification in any languages may enhance the adoption of OSILS. OSILS requires much better and widely available documentation to suit needs of all type of Library professionals and users as well.

Respondents were invited to suggest ways and means to enhance the quality of Koha software in particular. Majority of the respondents were satisfied with the existing functionalities and stated that they were able to perform all the activities of the library. However few of the respondents pointed out some specific suggestions which are summarized as follows.

1. Advanced hands on training on each module needs to be provided
2. SMS alerting system for the entire major patron oriented services needs to be incorporated
3. More awareness programs on the use of software needs to be rendered
4. Koha regional language support needs to be enhanced
5. More customization required in Serials control, Acquisition and Stock Verification modules
6. Customized options for different libraries on different functions need to be provided
7. Interface for both the patrons and staff members required to be more user friendly
8. The modules and navigation process in the software should be well organized
9. Customer support centers should be voluntarily incorporated
10. Articles indexing of books, journals etc. needs to be properly functionalized.
11. Automatic data backup facility needs to be incorporated
12. Modules for serial subscription and bound volumes management need to be integrated
13. Financial support from Institution and Government needs to be provided
14. Provision to get updates based on the on- going process of improvement and updates
15. Options to generate additional requirements needs to be incorporated
16. A team of round the clock technical support need to be made available from the experts to solve unexpected issues
17. Promotional activities requires to be enhanced in terms of training programs, workshops, seminars etc.

18. Comprehensive and widely available Multilanguage documentation on step by step installation, module wise functionalities to suit needs of all type of library professionals and users as well needs to be developed.
19. Policy makers, advisory committee etc. should recommend the mandatory adoption of OSILS in their libraries
20. More number of user groups should contribute for the development of Koha
21. Organizations or the management should allow library staff to attend the promotional activities
22. Customized versions of the software in regional language along with its documentation needs to be developed
23. Free online tutorials to be made available widely.
24. Facilities to add new modules such as in Content Management System like Joomla and Drupal etc., so that library professionals can add new features required by them.
25. Reliability of Live CD, DVD and WebPages for acquiring the software need to be improved.
26. Modules like Article Indexing and OPAC are to be made more user friendly
27. Constant development of the software needs to be ensured
28. Adopting library should have an in-house technologist who is familiar with open source systems and technologies.
29. Translated version of Koha manuals needs to be available in more languages
30. Self explanatory and simple tutorials/guides required to be shared in public platforms
31. Bugs and errors are required to be reported publicly
32. Community participation and their contributions need to be shared socially

33. Koha has better community support compared to any other OSILS
34. Support multi branch mode
35. Koha accommodates web 2.0 features and other better developed addition functionalities
36. Modules for digital content creation and open access repository features needs to be developed in Koha

The result of the study is useful to the library professionals to select suitable software for their library and to know the issues and concerns involved in the adoption of OSILS. The following are the recommendations to increase the rate of adoption of OSILS in Indian Libraries evolved from the study and survey.

## 7.2. Recommendations

From the responses received from various libraries on different aspects, following general guidelines were formulated for the adoption of OSILS.

**Infrastructure Development:** It is well known that infrastructure in most Indian libraries is limited by many factors, e.g., power failures, poor or unreliable client and server hardware, poor Internet speeds, inadequately trained staff etc. Solutions for such situations need to be implemented while considering the application of OSILS.

**Enhancement in Adoption:** The percentage of libraries in India considering migration to or adoption of an OSILS to perform the complete automation process needs to be enhanced. Issues associated with the rejection of OSS can be rectified by creating awareness and educating the professionals about the advantages of OSILS. Conducting training programs, awareness programs and adoption programs enable other professionals to enhance their understanding and thereby encourage libraries in adopting OSILS. NewGenLib software is known for its adoption program in which if a library that wishes to work with NewGenLib is required to agree to a 48-hour schedule (4 days of 12 hours each) in which NewGenLib staff does an online installation on the library's server and client machines, takes library's metadata in a suitable format for it to be converted to MARC-2 format, provides basic

training in metadata creation, and system administration. This service is entirely free and enables the library to quickly install and begin working with NewGenLib. Any further training required is then offered on payment. Such learning programs will reduce the fear of taking risk on OSILS and empowers the professionals to become self-sufficient to adopt OSILS instead of always relying on commercial vendors for installation and implementation. However intensive training programs for both the library professionals and the users' needs to be conducted. Accessibility of tutorials and step by step demonstrations, promotional activities like workshops, conferences and hands on training etc. help to enhance the visibility of the OSILS. It depends on the mandate and capacity as well as own competence of the institution whether to go for the one or the other type of software. This means the context of the institution; its own competences, budgets, etc. have to be considered. Measures to connect research libraries and knowledge repositories at national level through OSILS will bring more utility and reliability to OSILS. It is clear from the research study that many software are available in OSILS stream and many libraries are discouraged with the support and services provided by the commercial vendors. The trend to adopt OSILS has increased during the last decade and more libraries are switching to OSILS. Proper measurements should be taken to encourage Indian libraries to adopt OSILS. When compared to the existence of commercial software, OSILS are new to the library community. OSILS products are developed and its adoption by libraries started during the last two decades. OSILS are advisable in automation solution for libraries in India as they offer significant economic savings and facilitate libraries to control the software according to their local requirements. As a cost-cutting solution for libraries having budget constraints most of the libraries using commercial or proprietary software agreed to consider OSILS for their libraries. The future and sustainability of any OSILS dwells on its updates and active participation of user community.

**Collaborative Efforts:** It is essential to have a committed team of library staff from both professional and non-professional category with adequate literacy in computer applications for a successful library automation process. Among the staff, regular and constructive flow of communication is essential if the library intends to install and maintain the software on their own. Support from technical staff, organization as well as adequate planning is also

very much essential to complete the automation within a stipulated time. Comparatively, the proportion of semi professionals is found to be lesser than professionals and non-professionals. Lack of sufficient number of library staff and insufficient expertise to handle the installation and maintenance or customization of the ILS is significantly affecting the libraries and needs to be resolved through the selection of qualified professionals and providing them training. Independent Expert committee opinion should be sought on use of OSILS

**Problem Solving:** Issues like lack of confidence in changing the existing proprietary software, difficulties in maintaining OSILS, lack of support from vendors and community, lack of in-house technical expertise, complex installation procedures of OSILS, lack of reliability and motivation from the management and organizational policies, experience and training and sufficient manpower etc. needs to be resolved with priority. Koha requires a good understanding of the Linux operating system. Given that there are many distributions of Linux, this makes Koha installation a non-trivial challenge. However, some active users have developed installation packages which should make installation easy. These have to be tested under different Linux distributions. It would be useful to study the efficacy of such packages in real-life situations and to what extent these have helped new user libraries to implement Koha.

**Community Development:** It is difficult to determine as to how many libraries in India are actually using any of the OSILs in full just by ascertaining the download statistics shown by each website, as many of the libraries have just installed, tried and discontinued its use. Moreover, even though software like Koha has official platform to register the names of users, Koha users have not completely explored it. Each ILS is different and it has different features and modules. There is a need to develop guidelines or a framework that local libraries can use to ensure that uptake of OSS in the libraries is well structured, consistent and easy to adapt, regardless of the type of library. This framework has to have sufficient evaluation mechanism depending on the individual library information systems requirement or desired specifications (Amollo, 2013). Koha has an active user community in other parts of the world. It is not clear as to what extent Indian users of Koha contribute to and/or

benefit from user forums. It is also not clear, how effective this user community has been in problem-solving and trouble-shooting of new and existing users of Koha in India.

**Consortia Approach:** Present study shows that a majority of the Indian libraries particularly public and school libraries are either not automated or have partially automated their house-keeping operations due to various reasons. Those libraries where budgetary issues are more are seriously looking for alternative cost effective solution to automate their libraries. Savings can be achieved in a big way if they adopt OSILS widely in a consortia based model. Consortium model can be any local, regional, state or interstate, association of libraries or branch institutions. Adopting an OSILS through a consortium gives advantages in many ways in terms of finance, manpower, time and solving problems. Group installations, cooperative cataloguing and shared systems support etc. can be easily performed. Consortium based OSILS adoption allows libraries to reduce duplication of cataloguing effort and acquisition resources. The amount being spent for proprietary software can be utilized for developing and improving the OSILS thereby effectively and independently running the automation process.

**Documentation:** The documentation available should be simple, easy to understand and help professionals to adopt the software without third-party assistance. Documentation should explain the methods and requirements step by step so that even a fresher should be able to complete the task without much effort. Simple manuals, audio and video etc. for current OSILS is required to be prepared in English, Hindi and all other Indian languages. Also OSILS requires better and extensively available documentation to suit needs of all type of Library professionals.

**Customization:** Modules for Serials Control, Acquisitions and MIS Reports in OSILS requires a high degree of customization to make it fit to perform the advanced functions. Design and coordination of modules for generating reports and statistics on acquisition, catalog, shelving, patrons details, overdue, serials management or any list of data in the database need to be improved in Koha

**Skill Development:** Regardless of whether an outside agency is involved in the implementation or migration process, it is essential for library professional to get trained in the specific software for the use of the software further and to execute their job confidently and independently. It is vital for library professionals to learn OSS related skills and gain skills on the implementation and customization of the software being used in their library, which can substantially reduce the cost of hiring external expertise. Availability of online training materials and demonstrations prepared by other libraries based on their experiences helps professionals to learn through self-study. As the implementation of OSILS takes place, the library staff is required to acquire minimum technical skills to handle the issues and up keep of the software. Eventually, contemporary and advanced technologies are tailored to the main application to enhance the efficiency, which indirectly demands the upgradation of information professionals' knowledge on technology. Introduce librarians to OSS, give proper training and education, teach how to select appropriate hardware, collaborate with friends and experts. Among the concerns, professional support and documentation and training needs to be taken into account while implementing OSS solutions in India (Hanumappa, 2014). As OSILS requires strong technical knowledge to maintain the server and the systems, support of technical expertise is required for successful implementation and management. OSILS can enhance access to information and knowledge, collaborative research, innovations and communication at inter and intra institution levels and shall also enable to meet the demands of the present and future generations for barrier-free information services.

**Curriculum Development:** Application of OSILS should be part of the academic curriculum. Competencies in implementing, maintaining and servicing OSS and OSILS are to be acquired by LIS professionals. If these aspects are inducted in the LIS Course curriculum at UG and PG levels, the professionals shall be enabled to acquaint with these at the beginning of their profession. Considering the changing trends of the LIS professional environment and the technological developments the curriculum developers have to revise the curriculum at degree level and much emphasis needs to be given to keep pace with the emerging technologies and they should be groomed to take up the challenges of emerging technology applications. Students may also insist to complete some related project as a part



of the programme so as to enable them to get skills associated with the software systems to perform various activities of house-keeping operations.

**Support:** Government of India has been promoting and encouraging the use of open source technologies for e-governance, Request for Proposals (RFPs) etc. Similarly policies on formal adoption of OSILS in libraries of government organizations need to be formulated to enable effective adoption. Also both Central and State governments and professional associations have to play a key role to promote the use of OSILS in Indian libraries. Government of Kerala has already made policies which enable the automation of all government libraries in Kerala by adopting Koha OSILS. There are commercial companies in India which provide OSILS services among other things. The extent and usefulness of the customization based on the same distribution of the software being installed by these companies needs to be studied with the help of information provided by such companies. Governments may take steps to implement OSILS at different levels such as school libraries, college and university libraries. This naturally needs the involvement of respective library professionals to constitute the standards and requirements to be incorporated.

- Library Science courses should cover necessary theory and practice for minimum programming and customization of OSILS packages.
- As the technology advances are revolutionary and changes day by day, the ILS also should keep updated with the changes. Next generation characteristics need to be updated frequently with the ILS. The next generation ILS should support the concept of ‘discovery interface’ in its online catalogue so that it can retrieve multiple resources including print, electronic and digital works in a library. It can also enable recommendation services, faceted searching, relevance ranking, spell-check features etc.
- As a next generation ILS, it should also be able to provide ‘discovery service’ so that using one search box the ILS will be able to retrieve materials in all formats as the system act as a cloud based discovery interface which integrates all of a library’s collection in a single interface.

- OSILS should facilitate information discovery environments in a more comprehensive way
- Facility and tools available in the OSILS for searching mechanism should be extended not only for print but also for other resources in various formats such as electronic, digital etc.
- The development of an OSILS should be designed to create for both print and e resources. Irrespective of the type of content an OSILS should have a single and common search interfaces
- Equal consideration should be given to all aspects and functionalities of OSILS to accommodate both print and digital resources.
- Long term commitment of library professionals for the development of OSILS
- Koha is a true OSILS which can meet most of the specific needs of a library contributing to sustainable development.
- Consortia based model for group of libraries can be accommodated.
- Many commercial firms have already started the cloud based service to run the automation process which minimizes the expenses of hardware and infrastructure.
- Need to improve the awareness on existing OSILS through seminars, workshops, training programs etc
- Professionals have to develop their internal technical skills
- Commitment towards the adoption of OSILS by the professionals needs to be enhanced
- Creation of internal demonstration sites and web pages informing frequent updates and modifications make the staff more vigilant
- Government in State level should provide some grant to automate the library and insist them to use only OSILS.
- Online tutorials on installation, customization and adding additional features and services etc. needs to be provided.
- Information portal, wikis, blogs etc. in public domain needs to be made available.
- Process of installation and maintenance needs to be more easy and customized to access readily.

- Academic institutions and LIS Schools have to revise and formulate their curriculum to include more technology and functional issues related to OSILS.
- Union catalogues for all Indian universities, public libraries and government and non-governmental labs should be made online from which OSILS can download records.
- Compilation of manuals and documentations on installation and maintenance
- Continuous development of the software
- Promotion of OSILS through training programs, workshops seminars etc
- Institutions like, DRTC, NISCAIR, NCSI and professional associations in India should take lead for the developmental activities and training programs
- Pooling of technical expertise and sharing human resources helps to ease and enrich the adoption.
- Collaborative training programs needs to be organized.
- Sharing of experiences, expertise and feedbacks through forums, online pages etc
- Collective approach is essential.
- Resources and documentation based on free online platforms for libraries need to be created and updated.
- Online and instant chat solutions needs to be provided.
- Documentation issues may be addressed through online platforms, chats, emails, wikis etc
- OSILS awareness raising programs, training, workshops etc. are required to be conducted frequently and intensively.
- Familiarization with the current OSILS market is most beneficial in identifying a suitable software
- National level OSILS Committee to be constituted to evaluate OSILS, provide guidance, receive request for proposal to automate, improve the software, conduct seminars, workshops, awareness programs, conduct surveys, conduct interviews with the experts, etc.
- Development of OSILS should be platform independent so that the requirement of changing from one platform to other while adopting new software can be avoided. It should run on any platform.

- Restriction on number of records in any functionality, number of library staff clients, WebOPAC clients etc should be avoided
- Integration with Email and SMS needs to be achieved.
- The interface of the software should support mobile devices
- Better functionalities in serials management
- OSILS should have versions for libraries according to their type like academic, public libraries etc. or small, medium and large libraries etc.

In order to create an environment to adopt OSILS as a cost saving solution wider scale awareness programs and proper publicity are required. Inadequacy in the software related issues, support from vendors and community, reliability, major functionalities, features or modules, commercial support, exploring options for migration, proper documentation and the managerial issues such as knowledge in open source technology, IT infrastructure, adequate library collection in-house technical expertise, motivation from the management and organization, experience and training, sufficient manpower etc. These are the major issues limiting the adoption of OSILS in Indian libraries. Adoption or migration to OSILS should be achieved in a group of libraries instead of individual library doing it alone since it helps to save the additional cost of participating libraries in terms of training, maintenance, support etc. and other operational costs. There should be a geographically distributed centralized network of professionals to handle the system. The move from the government in getting financial assistance to establish the network of professionals needs to be strengthened. Online community and forums should be formed. Their participation to encourage discussions on various issues and concerns on all the aspects of adoption of OSILS also needs to be enhanced. The library professional associations should conduct continuous publicity campaigns, training programs, seminars, workshops etc. to educate both library professionals and users. Library professionals need to upgrade their skills and move forward with new skill sets. OSILS should have options for smooth migration and continued support either from the developer or from the related community. There is also need to share feedback on the experiences gained and customization done or the knowledge in software they are using. More training programs by software developers needs to be arranged. Documentation should be updated frequently. Many options available with Koha software that are essential modules to run modern library operations are also not fully used

by the users. Some of the libraries in India use Koha just for making their OPAC live and are not using other functional modules for all housekeeping activities such as Acquisition, Cataloguing, and Circulation etc. There should be mechanism to educate the users about the advantages and functions of each individual module available in the software.

The OSILS continues to grow year by year with new developments and updates which enable them to dominate in the library environment. Viability of Koha software as a countrywide software needs to be considered. Accordingly, policies need to be formulated for mandatory migration of data to Koha OSILS from existing ILS System. As the size and diversity in collection can be supported by Koha software, the software can be used for diverse libraries and consortia. Considering the growth rate of Koha software in India every year, more and more number of libraries in India are adopting it. There is a large community support and support from organisations, associations and governments at the State and national level. There are also individual support projects that are performing well to attract and encourage other libraries to adopt Koha software.

OSILS is an indicator of the practice of liberalization in the information world. Genuine efforts are being made to bring the automation technology to most of the local libraries with minimal or no cost. OSILS are being instrumental in bridging the digital gap in Indian information sector. Due to unavailability of technology when there was no OSILS, some libraries have made their ways with proprietary packages for a considerably long time. However, the recent developments in the related fields are more promising for a wide adoptability of OSILS in the years to come. There may be days to come in the near future where the libraries using paid software will migrate to OSILS to join the community that would grow to be enormous in size.

### **7.3. Future Studies**

Some proactive Indian users of Koha have taken initiatives to promote and distribute Koha. Also, there are a number of training programmes that Koha organizes. The effectiveness of these initiatives in encouraging public and small libraries in adopting Koha is not known. A study of effectiveness of such adoption would be useful. These initiatives point to the desire to make Koha sustainable, worldwide. The development, deployment, updating and upgrading, marketing and support of an OSILS requires

considerable ongoing investment of skills and funds. After its development many commercial companies came forward to provide paid support to libraries. The duration for which these commercial companies will continue to support and develop need to be thoroughly studied. Development of NewGenLib Software is the outcome of the effort, experiences and feedback of Indian library professionals, which makes the software suitable for Indian libraries on par with the advantages of international library management systems. National Informatics Centre (NIC) of Government of India initiated the development and distribution of e-Granthalaya software for automating libraries at a National level with a special focus on public libraries. As Koha OSILS is universally accepted by LIS community for library automation, the effort towards the 'single window access' needs to be initiated to facilitate automation for economically and libraries with weak infrastructure by the national agency of the Government of India. There should also be mechanism to interconnect the libraries of these kinds to create Union catalogue and to integrate the bibliographic details so that the entry in the database for similar collection could be easy. Further design, development, customization and implementation of the software also needs to be supported by the Government.

## APPENDICES

- Appendix -I**      Part – I: Common Questions for Libraries using any Integrated Library System (ILS)
- Appendix-II**      Part – II: Questions for Libraries using any Open Source Integrated Library System (OSILS)
- Appendix-III**      Part – III: Questions for Libraries using any Integrated Library System other than Open Source
- Appendix-IV**      Direct/ Telephonic Interview Schedule for Library Experts
- Appendix-V**      Final List of Responded Libraries from India

## APPENDIX -I

### **PART –I: Common Questions for Libraries using any Integrated Library System (ILS)**

This survey is undertaken as part of research work on 'Open Source Software for Integrated Library Systems: Relative Appropriateness in the Indian Context' by Gireesh Kumar, ARCI, Hyderabad for the PhD Degree at Centre for Advanced Research in Library and Information Science, Mahatma Gandhi University, Kottayam under the Guidance of Dr. R. Raman Nair. The questionnaire is intended to understand the factors that are hindering the adoption of Open Source Integrated Library System (OSILS) and to assess its relative appropriateness in Indian context. The result of the study is expected to help librarians and decision makers on choosing Integrated Library System (ILS) which can contribute to improving quality of information support to higher education and research

The information provided in the questionnaire will be kept confidential and identity of respondents will not be revealed to any one and the data provided will not be used for any purpose other than this specific research work.

Please respond to the questionnaire and help the researcher in arriving at realistic status/conclusions and evolving useful recommendations

The questionnaire contains three parts. PART -I: Common Questions for Libraries using any Integrated Library System (ILS). PART -II is only for those who use OSILS and PART -III is for those who use an Integrated Library System (ILS) package other than 'Open Source' i.e. Commercial/Proprietary/In-house/Software developed by others.

#### **PART –I: COMMON QUESTIONS FOR LIBRARIES USING ANY INTEGRATED LIBRARY SYSTEM (ILS)**

- 1. Your Name**
- 2. Designation\***
- 3. Educational Qualification\***
- 4. Age\***
  - 21-30 Years
  - 31-40 Years
  - 41-50 Years
  - More than 51 Years
- 5. Your E-mail Address\***



**6. Name of the Library\***

**7. URL Address of Your Library Webpage**

**8. Type of Library\***

- University Library
- College Library
- School Library
- Special or Research Library
- Corporate Library
- Public Library
- Nonprofit Institute Library

**9. Collection Size\***

- 1-49999 items
- 50000-99999 items
- 100000-499999 items
- 500000-999999 items
- 1000000 and above items

**10. Please Indicate the Staffing Pattern of Your Library\***

Please include the total number of staff working with your library with or without library science degree

	1-4	5-8	9-12	13-16	17-20	21 and Above	Nil
Professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Para Professionals/Semi Professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non-Professionals/Supporting Staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**11. Who is the Final Authority in Your Organization/ Institution in the Decision Making Process to Decide Which Library Software Should be Used\***

- Director/ Head of the institute
- Librarian
- Library advisory committee
- IT/Computer team
- Consortium members
- Users
- Other: \_\_\_\_\_

**12. Please Indicate the Nature of Software You Are Using Currently as ILS\***

- Commercial / Proprietary
- Open Source
- In-House
- Developed by Others

**13. Name the Integrated Library System (ILS) / Library Automation Software Currently being Used for Your Library\***

Integrated Library Systems (ILS) are multifunction, adaptable software applications that allow libraries to manage, catalog and circulate their materials to patrons

**14. Version of the Software You are Using Currently**

**15. Year in Which the Library Adopted Existing ILS \***

**16. Name the ILS / Library Automation System Used Previously (if any)**

**17. Are you Aware of the Existence of Open Source Integrated Library System \***

"Open Source" is a software-licensing model where the source code of the software is typically made available royalty-free to the users of the software, under terms allowing redistribution, modification and addition, though often with certain restrictions (copyright)

- Yes
- No

**18. Do You Support Adoption of Open Source Integrated Library System in Libraries \***

- Yes
- No
- No Opinion

**19. Please Name the OSILS You Found / Suggest Best Suitable for the Indian Scenario \***

Please answer the question by considering the capability of the software in handling Indian languages/scripts and its search features with regional languages

- ABCD
- e-Granthalaya
- Evergreen
- Koha
- NewGenLib
- PhpMyLibrary
- Other: \_\_\_\_\_

**20. In Your Opinion Who Should be Ideal to Write Documentation for**

**OSILS** \*Documentation can be Installation Guide, User Manual or Data Migration Guide

- Library Professionals
- Computer / IT Professionals
- Software Developers
- Software Vendors
- Team of Library and Software Experts
- Other: \_\_\_\_\_

**21. In Your Opinion What Are the Major Issue(s) Associated With the Wider Adoption of OSILS in Indian Libraries \***

- Lack of promotional activities
- Issues of data security
- Issues of software security
- Organizational policies
- Lack of technical knowledge required to install and maintain
- Lack of vendor support
- Shortage of skilled staff to install and maintain
- Lack of major functional features and modules
- Issue of reliability/longevity
- Lack of community support
- Lack of technical support
- Lack of high quality documentation
- Availability of commercial software
- Other: \_\_\_\_\_

## APPENDIX-II

### PART –II: Questions for Libraries using any Open Source Integrated Library System (OSILS)

(If the answer of Q. No. 12 is 'Open Source')

#### 22. Specify the Major Reason(s) Which Made You Decide to Choose Open Source ILS for Your Library? \*

- To cut short the costs
- To become part of the consortium
- Its ability to customize to fit the library's needs
- Its wider adoption/support/online community
- Availability of source code
- Easy to install, maintain and modify
- Freedom from maintenance and licensing fee
- Freedom from vendor Lock-in
- Uncertainty due to merges and outside ownership of proprietary software
- Concerns about the suppliers of proprietary ILS
- Availability of quality documentations
- Other: \_\_\_\_\_

#### 23. How Would You Rate Your Experience With the Functional Modules of Your OSILS Being Used Currently \*

	Excellent	Very Good	Good	Fair	Poor	Very Poor	Never Experienced
Acquisition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cataloguing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Circulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Serials Management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Statistical Reports	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Patrons Details	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OPAC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
System Administration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stock Verification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**24. Please List Out the Major Module(s) in Which You Think OSILS is Ideal Than Commercial Software \***

- Acquisition
- Circulation
- Catalogue
- OPAC
- Serials Management
- Authority Control
- Stock Verification
- MIS Reports
- Patrons Account
- Other: \_\_\_\_\_

**25. Choose the Major Functional Module(s) You Feel Customization Required in the Current OSILS Being Used \***

- Acquisitions
- Catalogue
- Circulation
- Serials Control
- MIS Reports
- Patrons Accounts
- OPAC
- Other: \_\_\_\_\_
- 

**26. Please Rate Your Level of Satisfaction With the Efficiency of Your Current OSILS On the Following Activities \***

Characteristics	Excellent	Very Good	Good	Fair	Poor	Very Poor	Never Experienced
Installation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Database Maintenance and Backups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Features and Functionalities of Modules	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Customizations and Integrations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
House Keeping and Report Generation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technical/Community Support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Characteristics	Excellent	Very Good	Good	Fair	Poor	Very Poor	Never Experienced
Documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User's Response	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Upgrades and Enhancements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Design and Coordination of Statistical Reports	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Managing Print Resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Managing Electronic Resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**27. Does You or Your Library Arrange Any of the Activities to Promote the Use of OSILS in Libraries \***

- Conference/Seminar
- Training Programs
- Workshop
- Added as the part Curriculum/Syllabus
- Created User Groups/Forums
- Lectures
- Other: \_\_\_\_\_

**28. How Did You Keep the Following Activities of OSILS Being Used in Your Library \***

Characteristics	Self	Outsourced to ILS vendor	Through another library	Through professional friends/community	Through library consortium	Through online tutorials	Through live CD/DVD Course materials	Nil
Installation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Migration of data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Configuration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training of staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Characteristics	Self	Outsourced to ILS vendor	Through another library	Through professional friends/community	Through library consortium	Through online tutorials	Through live CD/DVD Course materials	Nil
Hosting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Upgrading / Adding more features	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Customization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bug fixing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**29. Please Indicate Your Views On the Following Statements on OSILS Currently Being Used \***

Characteristics	Yes	No	Can't say
Supports all library services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supports customization display format depending on the requirement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supports storing and retrieval of records in local /other Indian scripts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supports indexing and searching of records in local /other Indian scripts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Characteristics	Yes	No	Can't say
Allows the end user to build queries in more than one script	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Allows creating interface in Multilanguage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Able to display text in more than one script	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**30. Do You Intend to Change / Migrate to Any Other Integrated Library System \***

- Yes
- No

**31. If Yes, Reason(s) of Dissatisfaction With the OSILS Currently Being Used**

- Found a software more suitable to the needs
- No current development activities
- Lack of technical support
- Difficulty in maintenance and upgradation
- Concerns about the existence of the software
- Other: \_\_\_\_\_

**32. Name the Software You Intend to Adopt or Migrate**

**33. Have You Encountered and Fixed Any Significant Bugs or Limitations of the Software Currently Being Used? Please Explain**

**34. Please Rate Your Level of Agreement With the Following Statements In the Indian Context \***

Characteristics	Strongly Agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
More libraries in India are switching to OSILS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Application of OSILS should be part of the academic curriculum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Support on OSILS has increased	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Characteristics	Strongly Agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
from both Library professional organizations and Government					
Library fraternity should involve in conducting training programs and workshop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Library professionals should have more opportunity to attend free awareness and training programs on OSILS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
High quality documentation on OSILS should be available on the public domain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OSILS provide significant economical and technological benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Application of OSILS in libraries leads to greater innovations and collaboration among the communities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Application of OSILS in libraries increases completion among service offerings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Application of OSILS in libraries facilitate efficient use of resources across the country	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OSILS are better choice for libraries to adopt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OSILS enhances the technical and technological expertise of library professionals and develop new skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adoption of OSILS helps sharing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Characteristics	Strongly Agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
of knowledge and skills					
OSILS are flexible and adaptable for all types of libraries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OSILS gives more control over the data and software	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OSILS are more suitable for long term services compared to proprietary systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Indian libraries should consider consortia model for wider adoption of OSILS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Indian Libraries should have Customized Versions of single OSILS for Any Type of Library	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Indian Libraries should have an OSILS to support various Indian scripts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**35. What Is the Best Thing About Adopting an OSILS \***

**36. What Is The Worst Thing About Adopting an OSILS \***

**37. Please Indicate Any Suggestions to Improve the Quality of OSILS**

**Currently Being Adopted in Your Library \***

Please elaborate your requirement of customization/modifications or any other suggestions to improve the quality of the OSILS being currently used in your library

## APPENDIX-III

### PART –III: Questions for Libraries Using Any Integrated Library System Other than Open Source

This section of the questionnaire is prepared to collect feedback from the library/IT/Computer professionals those who use any Integrated Library System (ILS) package other than 'Open Source' i.e. Commercial/Proprietary/In-house/Software developed by others.

#### 22. Rate Your Level of Satisfaction with the Following Features of Your Current ILS being Used \*

Characteristics	Extremely satisfied	Very satisfied	Moderately satisfied	Slightly satisfied	Not at all satisfied	Never used
Features and Functionalities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintenance and Backups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Customization and Integrations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vendor Support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
House Keeping and Report Generation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Managing Print Resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Managing Electronic Resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

#### 23. Rate Your Quality of Experiences With the Functional Modules of the ILS being Used Currently \*

Characteristics	Excellent	Very Good	Good	Fair	Poor	Never Experienced
Acquisition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cataloguing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Circulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Serials Management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Statistical	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Characteristics	Excellent	Very Good	Good	Fair	Poor	Never Experienced
Reports						
Patrons Details	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OPAC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
System Administration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stock Verification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**24. Is Your Library Planning to Adopt OSILS? \***

- Yes
- No
- Processing of switching to OSILS
- Other: \_\_\_\_\_

**25. If Yes, Please Indicate the Reason(s) Which Made You Consider Migrating to an OSILS?**

- Cost effectiveness
- Shrinking budget / pressure from the management
- Demand from users
- Easy to use and customize for local needs
- Technical/Community support
- Vendor support
- Flexibility
- Full control over the data and software
- Full control on the direction of development
- Other: \_\_\_\_\_

**26. If No, Please Specify the Reason(s) Why You Have Not Adopted Any OSILS**

Please select multiple answers if the reason is not pertained to a single reason

- Satisfied with the existing proprietary software
- Lack of major functionalities, features or modules
- Lack of support from vendors and community
- Lack of commercial support
- Lack of in-house technical expertise
- Complex installation procedures
- Lack of adequate library collection
- Difficulties in maintenance
- Lack of knowledge in open source technology

- Lack of experience and training
- Lack of proper documentation
- Lack of exploring options for migration
- Lack if IT infrastructure
- Lack of reliability
- Lack of motivation from the management / Organizational policies
- Lack of sufficient manpower
- Other: \_\_\_\_\_

## 27. Have You Ever Used/Trained in any Open Source Integrated Library System \*

Please indicate your answer if you ever tested or had a hands-on training or demonstration or attended workshop on OSILS

- Yes
- No

## 28. Which Software Do You Choose, If You Plan to Adopt Open Source ILS for Your Library? \*

- ABCD
- e-Granthalaya
- Evergreen
- Koha
- NewGenLib
- PhpMyLibrary
- Other: \_\_\_\_\_

## 29. Please Indicate Your Views on the Following Statements on OSILS in Comparison with the Proprietary/ In-house Software \*

Characteristics	Strongly Agree	Agree	Neither agree or disagree	Disagree	Strongly Disagree
OSILS requires more technical expertise than proprietary software	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OSILS are more expensive than anticipated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exhaustive training is required for implementing OSILS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OSILS lacks scalability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OSILS lack ability to meet current	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Characteristics	Strongly Agree	Agree	Neither agree or disagree	Disagree	Strongly Disagree
and future demands of the library					
OSILS has only fewer advanced features	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Entry of OSILS had a major effect on the proprietary ILS market?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OSILS increases the efficiency of the library services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OSILS gives financial advantages as compared to commercial ILS?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OSILS provides lower functionality than commercial software	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OSILS are less user-friendly than commercial ILS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OSILS lack high quality documentations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OSILS create more work for library staff interns of customization and maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**30.What Is the Best Thing About Adopting an OSILS? \***

**31. What Is the Worst Thing About Adopting an OSILS? \***

## APPENDIX-IV

### Direct / Telephonic Interview Schedule for Library Experts

Respected Sir/Madam

As part of my research work (which is in the final stage now) leading to PhD on the topic "OPEN SOURCE SOFTWARE FOR INTEGRATED LIBRARY SYSTEM: RELATIVE APPROPRIATENESS IN THE INDIA CONTEXT"

I wish to have suggestions/comments/recommendations from experienced people like you on the following aspects of OSILS (Open Source Integrated Library System) which also I wish to include in the dissertation:(No page restriction for expressing your comments)

1. Your views on sustainability of OSILS (Open Source Library Automation Software) in Indian libraries in the context of proprietary ILS being available?
2. In your opinion, which software under OSILS category would you suggest for a Indian library in the contemporary open source environment? and why?
3. Do you suggest any additional features or characteristics or customization required to be incorporated in the above mentioned OSILS in future?
4. In your opinion, what could be the reasons which hinder the adoption of OSILS in Indian libraries even though very powerful Open Source Library Automation packages have come into existence?
5. Your recommendations/suggestions to improve the rate of adoption of OSILS in Indian libraries
6. Your Name and Affiliation which I can refer in the dissertation if you kindly permit to quote you.

Sincerely

Gireesh Kumar

## APPENDIX-V

### FINAL LIST OF RESPONDED LIBRARIES FROM INDIA

SL NO	INSTITUTION	URL ADDRESS OF THE LIBRARY
01	Central Library, Modern College of Arts, Science and Commerce, Ganeshkhind, Pune, MAHARASHTRA-411 053	<a href="http://www.moderncollegegk.org/library.php">http://www.moderncollegegk.org/library.php</a>
02	Synthite Industries Ltd. Synthite Valley, Kolenchery, Ernakulam, KERALA-682 311	<a href="http://synthite.com/synthite.html">http://synthite.com/synthite.html</a>
03	Moualana Abussabah Library, Rouzathul Uloom Arabic College, Farook College, Calicut, KERALA-673 632	<a href="http://www.ruacollege.in/library.php">http://www.ruacollege.in/library.php</a>
04	Physiotherapy Library, Acharya Institutes of Health Science, No.51, Cholanagar, R.T. Nagar Post, Bengaluru, KARNATAKA - 560 032	<a href="http://www.aihs.ac.in/library.html">http://www.aihs.ac.in/library.html</a>
05	Library, Indian Institute of Science Education and Research (IISER) Mohali Library, Knowledge city, Sector 81, SAS, Manauli, PUNJAB-140306	<a href="http://14.139.227.197/">http://14.139.227.197/</a>
06	Library, Justice K S Hegde Institute of Management, Nitte, Karkala, Udupi, KARNATAKA - 574110	NA
07	Library, Sri. K.Puttaswamy First Grade College, High Tension Double Road, Mahadeswara Badavane, Gokulam 3rd Stage, Vijayanagar, Mysuru, KARNATAKA - 570016	NA
08	Library, Pandu College Library, Guwahati, ASSAM - 781 012	<a href="http://www.panducollege.org/index.php/library">http://www.panducollege.org/index.php/library</a>
09	Directorate of Management Information System and Technologies, DRDO HQrs, Technology Bhawan, New Mehrauli Road, NEW DELHI - 110 016	NA
10	Library, Institute of Distance and Open Learning (IODL), Gauhati University, Gopinath Bardoloi Nagar, Jalukbari, Guwahati, ASSAM-781014	<a href="http://www.idolgu.in/IDOL_library">http://www.idolgu.in/IDOL_library</a>
11	Kerala University of Fisheries and Ocean Sciences (KUFOs), Kannadi Kadu Service Rd, Panangad PO, Kochi, KERALA- 682 506	NA



12	Library, Bangalore University, Mysore Rd, Gnana Bharathi, Bengaluru, KARNATAKA- 560056	<a href="http://bangaloreuniversity.ac.in/facilities/library/">http://bangaloreuniversity.ac.in/facilities/library/</a>
13	Library, Tolani Maritime Institute, Talegaon Chakan Road, Induri, Talegaon, Pune, MAHARASHTRA-410 507	<a href="http://www.tolani.edu/tmi/index,97.html">http://www.tolani.edu/tmi/index,97.html</a>
14	Library, Centre for South Indian Studies (CSIS), A4, Ganga Nagar, Trivandrum, KERALA- 695 043	<a href="http://souparnika.org">souparnika.org</a>
15	Library, PES University (formerly PES Institute of Technology), 100 Feet Ring Road, BSK III Stage, Bangalore, KARNATAKA – 560085	<a href="http://library.pes.edu">http://library.pes.edu</a>
16	Library, College of Veterinary and Animal Sciences, Mannuthy Post, Thrissur, KERALA – 680 651	<a href="http://www.cvaslibrary.com">www.cvaslibrary.com</a>
17	BRIMS Library, Dr. V. N. Bedekar Institute of Management Studies, Building No. 4, Jnanadweep, Chendani Bunder Road, Thane (W) , MAHARASHTRA-400 601	<a href="http://www.vnbrims.org/management-institutes-thane-mumbai-research-publications-library.html">http://www.vnbrims.org/management-institutes-thane-mumbai-research-publications-library.html</a>
18	Dr.S.G.Desai Library, KLE University, Jawaharlal Nehru Medical College Campus, Nehru Nagar, Belagavi, KARNATAKA –590 010	<a href="http://www.jnmc.edu/library/drsgdesai-library">http://www.jnmc.edu/library/drsgdesai-library</a>
19	Library, Vartak College, Vasai Road (W), Palghar District, MAHARASHTRA – 401 202	<a href="http://www.vartaklibrary.co.nr">www.vartaklibrary.co.nr</a>
20	Biju Patnaik Central Library, National Institute of Technology (NIT), Rourkela, ODISHA – 769 008	<a href="http://library.nitrkl.ac.in/">http://library.nitrkl.ac.in/</a>
21	Mahatma Gandhi University (MGU) Library, Priyadarshini Hills P.O, Kottayam, KERALA – 686 560	<a href="http://library.mgu.ac.in">library.mgu.ac.in</a>
22	Library, Thiagarajar College Of Engineering (TCE), Madurai, TAMIL NADU - 625 015	<a href="http://tce.edu/library/">http://tce.edu/library/</a>
23	Library, Wadia Institute of Himalayan Geology (WIHG), 33, Gen. Mahadeo Singh Road, Dehra Dun, UTTARANCHAL-248 001	<a href="http://ns1.wihg.res.in/library.htm">http://ns1.wihg.res.in/library.htm</a>
24	IEC University Library, Atal Nagar, (Kallujhanda), Baddi, Dist. Solan, HIMACHAL PRADESH – 173 205	<a href="http://www.iecuniversity.com">www.iecuniversity.com</a>
25	Indira Gandhi Memorial (IGM) Library, University of Hyderabad, Hyderabad,	<a href="http://igmlnet.uohyd.ernet.in:8000">igmlnet.uohyd.ernet.in:8000</a>

	TELANGANA – 500 046	
26	Library, St.Xavier's College of Education (Autonomous), Palayamkottai , Tirunelveli, TAMIL NADU – 627 002	<a href="http://stxavierstn.edu.in/library.php">http://stxavierstn.edu.in/library.php</a>
27	Centaral Library, Joginpally BR Engineering College(JBREC), Bhaskar Nagar, Yenkapally, Hyderabad, TELANGANA – 500 075	<a href="http://jbrec.edu.in/facilities.php#Library">http://jbrec.edu.in/facilities.php#Library</a>
28	Library, Lekshmipuram College of Arts and Science,Manavalakurichi, Kalkulam, Neyyoor, Kanyakumari, TAMIL NADU – 629 802	<a href="http://www.lpc.org.in/college/library">http://www.lpc.org.in/college/library</a>
29	Hari Narain Knowledge Resource Centre (H.N.K.R.C.), CSIR-National Geophysical Research Institute (NGRI),Uppal Road, Hyderabad, TELANGANA –500007	<a href="http://www.ngri.org.in/library.html">http://www.ngri.org.in/library.html</a>
30	Library, Ashoka Trust for Research in Ecology and the Environment (ATREE), Royal Enclave, Srirampura,Jakkur Post, Banguluru, KARNATAKA – 560 064	<a href="http://www.atree.org/atree_library">http://www.atree.org/atree_library</a>
31	University Library, Cochin University of Science and Technology (CUSAT), Kalamassery, Ernakulum, KERALA – 682 022	<a href="http://library.cusat.ac.in/new/">http://library.cusat.ac.in/new/</a>
32	Library, Chinmaya Institute of Technology, Govindagiri, Chala,P.O Thottada, Kannur, KERALA - 670 007	<a href="http://chintech.org/infrastructure/library/#">http://chintech.org/infrastructure/library/#</a>
33	Library, Reva Institute of Technology & Management (REVA ITM), # 226 & 227, Kattigenahalli, Jala Hobli, Bagalur Cross, Yelahanka, Bangulure, KARNATAKA - 560064	<a href="http://113.193.227.250/webopac/Login.aspx">http://113.193.227.250/webopac/Login.aspx</a>
34	Central Library, Indian Institute of Science Education and Research-Thiruvananthapuram (IISER-TVM),Computer Science Building,College of Engineering Trivandrum Campus,Thiruvananthapuram, KERALA – 695016	<a href="http://www.iisertvm.ac.in/pages/iiser_tvm_library.php">http://www.iisertvm.ac.in/pages/iiser_tvm_library.php</a>
35	Library, Nalla Malla Reddy (NMR) Engineering College, 7-01, Divyanagar, Kachivani Singaram , Near Narapally, at 16th KM on Warangal Highway 202, Ghatkesar Mandal, Ranga Reddy	<a href="http://www.nmrec.edu.in/library.html">http://www.nmrec.edu.in/library.html</a>

	District- TELANGANA – 500 088	
36	University College of Arts Library, Tumkur University, Vishwavidyanilaya Karyalaya, B.H Road, Tumkur, KARNATAKA – 572103	<a href="http://tumkuruniversity.ac.in/index.php/university-college-of-arts-library/">http://tumkuruniversity.ac.in/index.php/university-college-of-arts-library/</a>
37	Central Library, Jawaharlal Nehru University (JNU), New Mehrauli Road, NEW DELHI – 110067.	<a href="http://lib.jnu.ac.in/">http://lib.jnu.ac.in/</a>
38	Library, National Power Training Institute (NPTI), Power Systems Training Institute (PSTI), P.B. No. 8201, Subramanyapura Road, Banasankari II Stage, Bangalore, KARNATAKA - 560 070	<a href="http://psti.kar.nic.in/wtxt_lib.htm">http://psti.kar.nic.in/wtxt_lib.htm</a>
39	Library, Warangal Institute of Technology and Science (WITS), Oorugonda (V), Gudepadu X Roads, Atmakur (M), Warangal, TELANGANA- 506342	<a href="http://wits.ac.in/generalinstructions.php">http://wits.ac.in/generalinstructions.php</a>
40	Library, Vijaya College Mulki, Kotekeri Road, Mulki, KARNATAKA - 574 154	<a href="http://www.vijayacollegemulki.org/library.html">http://www.vijayacollegemulki.org/library.html</a>
41	University Library, Mahatma Phule Krishi Vidyapeeth, Rahuri, Ahmednagar District, MAHARASHTRA – 413 722	<a href="http://mpkv.ac.in/University%20library.htm">http://mpkv.ac.in/University%20library.htm</a>
42	Jaswant S Kanwar Library, The International Crops Research Institute for the Semi-Arid-Tropics (ICRISAT), Patancheru, Hyderabad, TELANGANA - 502 324	<a href="http://elibrary.icrisat.org/JSK/nStartPage.htm">http://elibrary.icrisat.org/JSK/nStartPage.htm</a>
43	Library, School Of Legal Studies, Cochin University of Science and Technology(CUSAT), Kochi, KERALA - 682 022	<a href="http://sls.cusat.ac.in/#">http://sls.cusat.ac.in/#</a>
44	Central Library, Library, Documentation and Information Science Division, Indian Statistical Institute, 203 BT Road, Kolkata, WEST BENGAL – 700108	<a href="http://www.isical.ac.in/~library/">http://www.isical.ac.in/~library/</a>
45	Central Library, EIILM University, Malbassey, 8th Mile, Budang, West Sikkim, SIKKIM-737121	NA
46	Central Library, R V College of Engineering, R V Vidyanikethan Post, Mysore Road Banguluru, KARNATAKA - 560 059	<a href="http://www.rvce.edu.in/library.php">http://www.rvce.edu.in/library.php</a>

47	BrahMos Aerospace Knowledge Centre (BMKC), BrahMos Aerospace, Balapur, Hyderabad, TELANGANA -500 005	NA
48	Learning Resource Center (LRC), Jaypee University of Information Technology, Waknaghat, Solan, HIMACHAL PRADESH -173234	<a href="http://www.juit.ac.in/library">http://www.juit.ac.in/library</a>
49	Learning Resource Centre (Central Library), IMS Engineering College, NH-24, Adhyatmik Nagar, Near Dasna, Ghaziabad District, UTTAR PRADESH -201 009	<a href="http://www.imsec.ac.in/learning.htm">http://www.imsec.ac.in/learning.htm</a>
50	Central Library, Kannur University, Civil Station (P.O), Kannur, KERALA-670002	<a href="http://kannuruniversitylibrary.ac.in">kannuruniversitylibrary.ac.in</a>
51	Scientific Information Resource Division (SIRD), Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam, TAMIL NADU - 603 102	<a href="http://www.igcar.ernet.in/igc2004/sird/">http://www.igcar.ernet.in/igc2004/sird/</a>
52	Information Management & Dissemination Centre (IMDC), Knowledge Resource Centre, National Metallurgical Laboratory (NML), Burmah Mines, Jamshedpur, JHARKHAND - 831007	<a href="http://library.nmlindia.org/index.htm">http://library.nmlindia.org/index.htm</a>
53	Central Library, Maulana Azad National Urdu University (MANUU), Urdu University Road, Gachibowli, Hyderabad, TELANGANA - 500032	<a href="http://www.manuu.ac.in/central_library.php">http://www.manuu.ac.in/central_library.php</a>
54	Knowledge Centre (Library), Automotive Research Association of India (ARAI), Survey No. 102, Vetal Hill, Kothrud, Pune, MAHARASHTRA - 411 038	<a href="https://www.araiindia.com/services_education_n_training_knowledge_center.asp">https://www.araiindia.com/services_education_n_training_knowledge_center.asp</a>
55	Library, Dr. Reddys Laboratories, Global Medical Affairs, 6- 3-865, 3rd Floor, Madhupala Towers, Ameerpet, Hyderabad, TELANGANA - 500016	NA
56	University Library, Kalinga Institute of Industrial Technology (KIIT University), KIIT Rd, Patia, Bhubaneswar, ODISHA - 751024	<a href="http://www.kiit.ac.in/centrallibrary/index.html">http://www.kiit.ac.in/centrallibrary/index.html</a>
57	Moulana Rasool Shah Memorial (M.S.R.M) Library, The Islamia College of Science and Commerce, College Road Hawal, Srinagar, JAMMU & KASHMIR - 190 002	<a href="http://www.islamiacollege.edu.in/index.php/facilities/2014-12-06-18-50-17">http://www.islamiacollege.edu.in/index.php/facilities/2014-12-06-18-50-17</a>

58	Library, Amruta Institute of Engineering & Management Sciences (AleMS), Bidadi Industrial Town, Ramanagaram, Near Toyota Kirloskar Motors Road, Bengaluru, KARNATAKA – 562 109	<a href="http://www.aiems.in/facilities/library/">http://www.aiems.in/facilities/library/</a>
59	Library, South Asia Institute of Advanced Christian Studies (SAIACS), BOX 7747, Dodda Gubbi Cross Rd, Kothanur Post, Bengaluru, KARNATAKA -560 077	<a href="http://www.saiacs.org/Library.html">http://www.saiacs.org/Library.html</a>
60	Central Library, Priyadarshini Institute of Technology (PDIT), Ramachandrapuram, Tirupati, ANDHRA PRADESH – 517 561	<a href="http://www.pdittpt.com/library.html">http://www.pdittpt.com/library.html</a>
61	EXIM – Knowledge Centre, (Export-Import Bank of India), Floor 21, Centre One Building, World Trade Centre Complex, Cuffe Parade, Mumbai, MAHARASHTRA - 400 005	NA
62	Library, Satluj Public School, Senior Wing, Sector 4, Panchkula, CHANDIGARH -160012	NA
63	Library, National Institute of Science Education and Research (NISER), Institute of Physics Campus, PO: Sainik School, Bhubaneswar, ODISHA-751 005	<a href="http://www.niser.ac.in/library/">http://www.niser.ac.in/library/</a>
64	K N Raj Library, Centre for Development Studies(CDS), Prasanth Nagar, Medical College P.O, Ulloor, Thiruvananthapuram, KERALA - 695 011	<a href="http://www.cds.edu/support/kn-raj-library/">http://www.cds.edu/support/kn-raj-library/</a>
65	Central Library, Acharya Institute of Management and Sciences (AIMS), 1st Cross, 1st Stage, Peenya, Bengaluru, KARNATAKA – 560058	<a href="http://www.theaims.ac.in/aims-infrastructure.html">http://www.theaims.ac.in/aims-infrastructure.html</a>
66	Library, Dr. YSR National Institute of Tourism and Hospitality Management, Telecom Nagar, Gachibowli, Hyderabad, TELANGANA– 500032	<a href="http://www.nithm.ac.in/index.php?option=com_content&amp;view=article&amp;id=79&amp;Itemid=124">http://www.nithm.ac.in/index.php?option=com_content&amp;view=article&amp;id=79&amp;Itemid=124</a>
67	Library, Competition Commission of India (CCI), 3rd Floor, The Hindustan Times House, 18-20, Kasturba Gandhi Marg, Connaught Place, NEW DELHI – 110 001	NA
68	Technical Information Centre, Research and	NA

	Development Establishment (Engrs.) Dighi, Pune, MAHARASHTRA- 411 015	
69	Dr S.K.Chatterjee Library, National Institute of Occupational Health (NIOH) (Indian Council of Medical Research), Meghani Nagar, AHMEDABAD-380016	<a href="http://www.nioh.org/departments/library.html">http://www.nioh.org/departments/library.html</a>
70	Library & Information Services, State Council of Educational Research & Training (SCERT), (Vidyabhavan), Poojappura PO, Thiruvananthapuram, KERALA -695 012	<a href="http://www.scert.kerala.gov.in/index.php?option=com_content&amp;view=article&amp;id=77&amp;Itemid=72">http://www.scert.kerala.gov.in/index.php?option=com_content&amp;view=article&amp;id=77&amp;Itemid=72</a>
71	Library, Indian Institute of Geomagnetism (IIGM_, Mumbai Headquarter(Panvel campus), Plot 5, Sector 18, Near Kalamboli Highway, New Panvel (W),Navi Mumbai, MAHARASHTRA – 410218	<a href="http://library.iigm.res.in/">http://library.iigm.res.in/</a>
72	Library Resource Centre (LRC), Chandragupta Institute of Management, Phaneeshwar Nath Renu Hindi Bhawan, Frazer Road, Near Radio Station, Chajjubagh, Patna, BIHAR-800001	<a href="http://www.cimp.ac.in/library.aspx">http://www.cimp.ac.in/library.aspx</a>
73	Central Library, PEC University of Technology (Formerly Punjab Engineering College), Sector - 12, CHANDIGARH -160012	<a href="http://pec.ac.in/~pecac/new/library/">http://pec.ac.in/~pecac/new/library/</a>
74	Library & Information Centre, Government First Grade College for Women, Hunsur, Hunsur(T), Mysuru, KARNATAKA -571 105	NA
75	Central Library, Anil Neerukonda Institute of Technology & Sciences (ANITS), Bheemunipatnam (Municipality), Sangivalasa, Vishakapatnam, ANDHRA PRADESH – 531162	<a href="http://anits.edu.in/library.php">http://anits.edu.in/library.php</a>
76	Central Library, Karunya University, Karunya Nagar, Coimbatore, TAMIL NADU -641 114	<a href="http://www.karunya.edu/library/index.html">http://www.karunya.edu/library/index.html</a>
77	Learning & Information Resource Centre (LIRC), St. Francis Institute of Management and Research (SFIMAR), Gate No.5, NMt. Poincur, S.V.P Road, Borivali West, Mumbai, MAHARASHTRA-400103	<a href="http://www.sfimar.org/Infrastructure.php">http://www.sfimar.org/Infrastructure.php</a>
78	P K Kelkar Library, Indian Institute of Technology (IIT Kanpur), Kalyanpur, Kanpur,	<a href="http://pkklib.iitk.ac.in/">http://pkklib.iitk.ac.in/</a>

	UTTAR PRADESH -208016	
79	Knowledge Centre, Koshys Institute of Managment Studies (KIMS), Sy. No. 31/1,Kadusonnappana Halli, Hennur-Bengaluru Main Road, Kannur Post, Bengaluru, KARNATAKA – 562 149	NA
80	Library, SAI International School, Plot - 5A,Chandaka Industrial Estate, Infocity Road, Bhubaneshwar, ODISHA – 751031	<a href="http://www.saiinternationalschool.com/academics-more/senior-secondary-school/life-at-sai/library">http://www.saiinternationalschool.com/academics-more/senior-secondary-school/life-at-sai/library</a>
81	Division of Library & Information Services, Regional Cancer Centre (RCC), Medical College Campus, Post Bag No.2417, Thiruvananthapuram, KERALA – 695 011	<a href="http://www.rcctvm.org/Library_information.htm">http://www.rcctvm.org/Library_information.htm</a>
82	Central Library, Chaitanya Engineering College, Kommadi, Chaitanya Valley, Madhurawada, Visakhapatnam, ANDHRA PRADESH– 530 041	<a href="http://cec.ac.in/index.php?option=com_content&amp;view=article&amp;id=39&amp;Itemid=35">http://cec.ac.in/index.php?option=com_content&amp;view=article&amp;id=39&amp;Itemid=35</a>
83	The Library and Information Centre (LInC), Nagindas Khandwala College (NKC), Road No.1, Off S V Road, Bhadrnagar, Malad West,, Mumbai, MAHARASHTRA-400062	<a href="http://www.nkc.ac.in/DisplayPage.aspx?page=cmq&amp;ItemID=323">http://www.nkc.ac.in/DisplayPage.aspx?page=cmq&amp;ItemID=323</a>
84	Boothalingam Library, MS Swaminathan Research Foundation (MSSRF), Pillaiyarkuppam, Thondamanatham post, Vazhuthavoor road, Pudhucherry, TAMIL NADU -605502	<a href="http://www.mssrf.org/?q=content/library">http://www.mssrf.org/?q=content/library</a>
85	Central Library (SIBM-Library), Symbiosis International University, Lavale ,Mulshi, Pune, MAHARASHTRA-412115	<a href="http://siu.edu.in/students/library.php">http://siu.edu.in/students/library.php</a>
86	Library, Department of Library and Information Science, Colleges of Arts & Commerce, Andhra University, Visakhapatnam, ANDHRA PRADESH - 530 003	<a href="http://www.andhrauniversity.edu.in/arts/library/inf.html">http://www.andhrauniversity.edu.in/arts/library/inf.html</a>
87	Central Library, Maharajah's College of Pharmacy, Phoolbaugh, Vizianagaram, ANDHRA PRADESH-535002	<a href="http://www.mrpharmacy.in/CentralLibrary.html">http://www.mrpharmacy.in/CentralLibrary.html</a>
88	Library, Dept. of Library and Information Science, Alagappa University,Karaikudi, TAMIL NADU-630 003	<a href="http://alagappauniversity.ac.in/departments/aboutus.php?dept_id=23">http://alagappauniversity.ac.in/departments/aboutus.php?dept_id=23</a>

89	Library, Infosys, 44, Electronics City, Hosur Road, Bangalore, KARNATAKA-560100	NA
90	Library, St. Stephen's College, Uzhavoor P O, Kottayam,KERALA-686634	<a href="http://www.ststephenslibrary.com/">http://www.ststephenslibrary.com/</a>
91	Scientific Information Resource Division (SIRD), Bhabha Atomic Research Centre (BARC), Near Vikram Sarabai Bhawan, BARC Road, Trombay,, Mumbai, MAHARASHTRA-400085	<a href="http://barc.gov.in/kmg/sird/index.html">http://barc.gov.in/kmg/sird/index.html</a>
92	Central Library, Vellore Institute of Technology (VIT) University, Vellore Campus, Vellore, TAMIL NADU- 632 014	<a href="http://info.vit.ac.in/Library/Exceptional_Library.asp">http://info.vit.ac.in/Library/Exceptional_Library.asp</a>
93	Library, Pillai College of Arts, Commerce & Science, Dr. K. M. Vasudevan Pillai Campus, Plot No. 10, Sector 16, New Panvel,MAHARASHTRA - 410 206	<a href="http://library.pcacs.ac.in">http://library.pcacs.ac.in</a>
94	Dravidian University Central Library (Bishop Caldwell Dravidian e-Resources Centre), Dravidian University, Srinivasa Vanam, Chittoor Dist., Kuppam,ANDHRA PRADESH-517 425	<a href="http://www.dravidianuniversity.ac.in/central-library.php">http://www.dravidianuniversity.ac.in/central-library.php</a>
95	Central Library, Sanjay Memorial Institute of Technology (SMIT), Raghunathpur,Hill Patna, Berhampur (Ganjam), ODISHA- 761100	<a href="http://www.smitorissa.org/library.htm">http://www.smitorissa.org/library.htm</a>
96	Visva-Bharati Library Network, Central Library, Visva-Bharati, Santiniketan, WEST BENGAL- 731235	<a href="http://14.139.211.2/index1.html">http://14.139.211.2/index1.html</a>
97	Library, College of Horticulture, Kerala Agricultural University, Vellanikkara, KAU P.O., Thrissur, KERALA-680656	<a href="http://cohvka.kau.in/institution/college-library">http://cohvka.kau.in/institution/college-library</a>
98	Library and Information Center, JSS Academy of Technical Education, C-20/1, Sector 62, Noida, UTTAR PRADESH-201301	<a href="http://www.jssaten.ac.in/Library/Library.php">http://www.jssaten.ac.in/Library/Library.php</a>
99	Library, Homi Bhabha Centre For Science Education, (TIFR) V. N. Purav Marg, Mankhurd, Near Anushakti Nagar Bus Depot,Mumbai, MAHARASHTRA-400088	<a href="http://library.hbcse.tifr.res.in/">http://library.hbcse.tifr.res.in/</a>
100	Library, Gujarat National Law University (GNLU), Attalika Avenue, Knowledge Corridor, Koba, Gandhinagar,GUJARAT-382007	<a href="http://www.gnlu.ac.in/library.php">http://www.gnlu.ac.in/library.php</a>



101	Library & Information Center, Anand College of Engineering & Management (ACEM), Sultanpur Road, Opp R.C.F, Kapurthala, PUNJAB-144 601	<a href="http://www.acemlibrary.in/">http://www.acemlibrary.in/</a>
102	Siva Sivani Institute of Management, Kompally, Secunderabad, Hyderabad, TELANGANA -500 014	<a href="http://www.ssim.ac.in/infrastructure-main.html">http://www.ssim.ac.in/infrastructure-main.html</a>
103	Library, PVDT College of Education, SNDT Women's University, Mumbai Churchgate Campus, Nathibai Thackersey Road, Mumbai, MAHARASHTRA-400020	<a href="http://sndt.ac.in/university-library/ul-intro.htm">http://sndt.ac.in/university-library/ul-intro.htm</a>
104	Learning Resource Centre (LRC), Indira Gandhi Delhi Technical University for Women (IGDTUW), Kashmere Gate, NEW DELHI-110006	<a href="http://igdtuw.ac.in/index.php?option=com_content&amp;view=article&amp;id=161&amp;Itemid=38">http://igdtuw.ac.in/index.php?option=com_content&amp;view=article&amp;id=161&amp;Itemid=38</a>
105	Library, Gurudas College, 1/1, Suren Sarkar Rd, Phoolbagan, Beliaghata, Kolkata, WEST BENGAL-700010	<a href="http://gurudacollege.edu.in/library">http://gurudacollege.edu.in/library</a>
106	CK Nair Library, Nehru Arts and Science College, Padnekat Post, Kanhangad, Kasaragod, KERALA-671314	<a href="http://nasc.ac.in/library">http://nasc.ac.in/library</a>
107	Library, Jaipuria Institute of Management, Shahid Path, Vineet Khand, Gomti Nagar, Lucknow, UTTAR PRADESH- 226010	<a href="http://library.jaipuria.ac.in">http://library.jaipuria.ac.in</a>
108	Library, Sri Krishna Institute of Technology (SKIT), No.29, Hesaraghatta Main Road, Chimney Hills, Chikkabanavara Post, Banguluru, KARNATAKA-560090	<a href="http://www.skit.org.in/facilities_library.html">http://www.skit.org.in/facilities_library.html</a>
109	Library, National Remote Sensing Centre (NRSC), CRF Colony, Balanagar, Hyderabad, ANDHRA PRADESH-500037	NA
110	Library, Pandu College, Pandu College, Guwahati, ASSAM-781 012	<a href="http://www.panducollege.org/index.php/library">http://www.panducollege.org/index.php/library</a>
111	Central Library, Sinhgad College of Engineering, 19/15, Smt Khilare Marg, Off Karve Road, Erandwane, Pune, MAHARASHTRA-411004	NA
112	Ananda Rangapillai Library, Pondicherry University, Bharat Ratna Dr. B.R.Ambedkar	<a href="http://210.212.230.223/">http://210.212.230.223/</a>

	Administrative Building, R.V.Nagar, Kalapet,Puducherry, TAMIL NADU – 605014	
113	Library & Resource Centre, SOT, Pandit Deendayal Petroleum University (PDPU), Gandhinagar, GUJARATH-382007	<a href="http://sptlib.pdpu.ac.in/">http://sptlib.pdpu.ac.in/</a>
114	Library, National Institute of Technology Goa (NIT, Goa), Farmagudi, Ponda, GOA-403 401	NA
115	Library, Department of Ship Technology, Cochin Science and Technology (CUSAT),Thrikkakara, South Kalamassery, Kochi, KERALA– 682022	<a href="http://172.16.4.5/">http://172.16.4.5/</a>
116	Library, PES Institute of Technology, Bangalore South Campus, Hosur Road Campus, (1 Km before Electronic City),Bengaluru, KARNATAKA-560 100	NA
117	Library, Bangalore Technological Institute (BTU), Kodathi, Off Bangalore - Sarjapur Road,Bangalore East Taluk, Bengaluru, KARNATAKA-560 035	<a href="http://www.btibangalore.org/library.html">http://www.btibangalore.org/library.html</a>
118	KSOU Library, Karnataka State Open University (KSOU) Library, Mukhtagangotri, Mysuru, KARNATAKA -570 006	<a href="http://karnatakastateopenuniversity.in/library-2">http://karnatakastateopenuniversity.in/library-2</a>
119	Central Library, Amrita Vishwa Vidyapeetham, Mysore Campus, #114, 7th Main Bogadi II Stage, Mysore, KARNATAKA-570026	<a href="https://www.amrita.edu/campus/mysore/infrastructure">https://www.amrita.edu/campus/mysore/infrastructure</a>
120	Central Library, P.E.S.College of Engineering, Mandya, KARNATAKA - 571 401	<a href="http://library.pes.edu">http://library.pes.edu</a>
121	Technical Information Centre (TIC), Defence Metallurgical Research Laboratory (DMRL), Kanchanbagh, Hyderabad, ANDHRA PRADESH-500 058	NA
122	Central Library, Krishna Kanta Handiqui State Open University (KKHSOU), Housefed Complex, Dispur, Guwahati, ASSAM– 781006	<a href="http://www.clkkhsou.org/">http://www.clkkhsou.org/</a>
123	Library, Central Manufacturing Technology Institute (CMIT), Tumkur Road, Bengaluru, KARNATAKA-560022	<a href="http://www.cmti-india.net/?q=E-Journal">http://www.cmti-india.net/?q=E-Journal</a>
124	Library, French Institute of Pondicherry,11, St.Louis Street,P.B. 33, Pondicherry, TAMIL	<a href="http://www.ifpindia.org/content/library">http://www.ifpindia.org/content/library</a>

	NADU-605 001	
125	Library, Lokmanya Tilak College of Engineering, Sector 4, Vikas Nagar, Koparkhairane, Mumbai, MAHARASHTRA-400709	<a href="http://www.ltce.ltjss.net/index.php/library">http://www.ltce.ltjss.net/index.php/library</a>
126	Library, Mar Baselios Institute of Technology and Science (MBITS), Nellimattom P.O, Kothamangalam, Ernakulam District, KERALA – 686693	<a href="http://www.mbits.edu.in/library.php">http://www.mbits.edu.in/library.php</a>
127	University Library, Gurukula Kangri Vishwavidyalaya, P.O Gurukula Kangri, Haridwar, UTTARAKHAND-249404	<a href="http://gkv.ac.in/?page_id=398">http://gkv.ac.in/?page_id=398</a>
128	Library, Mysore University, Manasagangotri, Mysore, KARNATAKA-570006	<a href="http://www.uni-mysore.ac.in/library/index.html">http://www.uni-mysore.ac.in/library/index.html</a>
129	Library, Aurora's Scientific and Technological & Research Academy (ASTRA) , Bandlaguda, Chandrayangutta, Hyderabad, TELANGANA-500005	<a href="http://www.astra.edu.in/library.html">http://www.astra.edu.in/library.html</a>
130	Library, Vidya Vikas Institute of Engineering & Technology (VVIET), #127-128, Mysuru - Bannur Road, Alanahally, Alanahally Post, Mysuru, KARNATAKA-570 028	NA
131	Library, Dhanwate National College, Congress Nagar, Near Ajni Railway Station, Ajni, Nagpur, MAHARASHTRA-440012	<a href="http://www.dhanwatanationalcollege.com/infrastructure/library">http://www.dhanwatanationalcollege.com/infrastructure/library</a>
132	Central Library, National Institute of Technology Delhi (NIT Delhi), Institute of Applied Manpower Research (IAMR Campus), A-7, Institutional Area, Near Satyawadi Raja Harish Chandra Hospital, Narela, NEW DELHI –110040	<a href="http://nitdelhi.ac.in/centralLibrary.php">http://nitdelhi.ac.in/centralLibrary.php</a>
133	Central Library, University Institute Of Technology, The University of Burdwan, Golapbag (North), Burdwan, WEST BENGAL - 713104	NA
134	Learning Resource Centre (LRC), Indian School of Business (ISB), Gachibowli, Hyderabad, TELANGANA - 500 032	<a href="http://www.isb.edu/faculty-research/lrc">http://www.isb.edu/faculty-research/lrc</a>
135	Library and Information Center, PES Science	NA

	College, MC Road, Mandya, KARNATAKA - 571401	
136	Library, Chaitanya Postgraduate College (Autonomous), Kishanpura, Hanamkonda, Warangal, TELANGANA -506001	<a href="http://www.chaitanyacolleges.com/index.php?p=Library_Chaitanya.php">http://www.chaitanyacolleges.com/index.php?p=Library_Chaitanya.php</a>
137	Library, Agasti Arts, Commerce & Dadasaheb Rupwate Science College, Akole A/p Tal – Akole, Ahmednagar, MAHARASHTRA-422601	<a href="http://agasticollege.com/AboutLibrary.aspx">http://agasticollege.com/AboutLibrary.aspx</a>
138	Library, Universal College of Engineering & Technology, Anbagam Campus, Radhapuram Road, Vallioor, Tirunelveli, TAMIL NADU-627 117	<a href="http://www.unienggtech.org/library.asp">http://www.unienggtech.org/library.asp</a>
139	Library, Archaeological Survey of India (ASI), Office of the Superintending Archaeologist, Kendriya Sadan, 3rd Floor, 2nd Block, Sultan Bazar, Koti, Hyderabad, ANDHRA PRADESH -	NA
140	Library, O.P. Jindal Global University, Sonipat Narela Road, Near Jagdishpur, village Sonipat, HARYANA-131001	<a href="http://www.jgu.edu.in/library/">http://www.jgu.edu.in/library/</a>
141	Central Library, Sayaji Rao Gaekwad Library, Banaras Hindu University Campus, Varanasi, UTTAR PRADESH-221005	<a href="http://www.bhu.ac.in/bhulibrary/index.html">http://www.bhu.ac.in/bhulibrary/index.html</a>
142	Library, Rane Polytechnic Technical Campus, No.82 Sethurapatti Fatima Nagar P.O. (behind Fatima Hospital), Tiruchirappalli, TAMIL NADU-620 012	<a href="http://www.ranepolytechnic.edu.in/infralib.html">http://www.ranepolytechnic.edu.in/infralib.html</a>
143	Library, Swami Devi Dyal Hospital & Dental College, Golpura, Barwala, Panchkula, HARYANA-134009	<a href="http://swamidevidyal.ac.in/Facilities.aspx">http://swamidevidyal.ac.in/Facilities.aspx</a>
144	Library & Information Centre, JSS College of Pharmacy, Onslows Rd, Bombay Castle, Davisdale, Ooty, TAMIL NADU-643001	<a href="http://www.jsscpooty.org/library-information-centre">http://www.jsscpooty.org/library-information-centre</a>
145	Sukham Memorial Central Library, Bhai Gurdas Institute of Engineering and Technology (BGiet), Sangrur, PUNJAB-148001	<a href="http://www.bgiet.ac.in/library.aspx">http://www.bgiet.ac.in/library.aspx</a>
146	Knowledge Services, Advinus Therapeutics Ltd., 21 & 22, Phase 2, Peenya Industrial Area, Bengaluru, KARNATAKA-560058	NA

147	Central Library, Sudharsan Engineering College (SEC), Sathiyamangalam, Pudukkottai, TAMIL NADU – 622501	<a href="http://www.sec.ac.in/central-library.php?catID=9">http://www.sec.ac.in/central-library.php?catID=9</a>
148	Library, Govt. First Grade college, M.G.Road, Chikkaballapur, KARNATAKA-562 101	NA
149	Library, Acharya Shrimannarayan Polytechnic, Arvi Road, Pipri, Wardha, MAHARASHTRA-442001	<a href="http://asp.shikshamandal.org/?page_id=2452">http://asp.shikshamandal.org/?page_id=2452</a>
150	Central Library, Central University, Amrita Vishwa Vidyapeetham University, Amritapuri, Clappana P. O.Kollam, KERALA-690525	<a href="https://www.amrita.edu/department/library">https://www.amrita.edu/department/library</a>
151	Library and Information Centre, Vaishnavi School of Architecture and Planning Survey No. 48/A, Guttala Begumpet, Kavuri Hills, Lane Opp: IGNOU Regional Centre Hyderabad, TELANGANA - 500 033	<a href="http://www.ves.edu.in/library.html">http://www.ves.edu.in/library.html</a>
152	Library, Fluid Control Research Institute (FCRI), Kanjikode West, Palakkad, KERALA – 678 623	NA
153	Central Library, Guru Nanak Dev Engineering College (GNDEC), Gill Park, Ludhiana, PUNJAB-141006	<a href="http://gndec.ac.in/library/">http://gndec.ac.in/library/</a>
154	Library, The LNM Institute of Information Technology (LNMIIT), Rupa ki Nangal, Post-Sumel, Via-Jamdoli, Jaipur, RAJASTHAN-302031	<a href="http://www.lnmiit.ac.in/Library/index.html">http://www.lnmiit.ac.in/Library/index.html</a>
155	Library, Vijnan Institute of Science and Technology (VISAT), Vinjyan Nagar, Nelloorupara, Mutholapuram P O, Elenji Piravom, Ernakulam Dist, KERALA-686665	<a href="http://visat.in/pages/library">http://visat.in/pages/library</a>
156	Central Library, TKM College of Engineering (TKMCE), Karicode, Kollam, KERALA-691005	<a href="http://www.tkmce.ac.in/html/library.html">http://www.tkmce.ac.in/html/library.html</a>
157	University Library, JECRC, Plot No. IS-2036 to 2039, Sitapura Industrial Area Extn, Near Mahatma Gandhi Hospital, Ramchandrapura, Jaipur, RAJASTHAN-303905	<a href="http://jecrcuniversity.edu.in/infrastructure/index/4">http://jecrcuniversity.edu.in/infrastructure/index/4</a>
158	University Library, Kerala University Library, Palayam, University Post, Thiruvananthapuram, KERALA-695034	<a href="http://www.kulib.in/">http://www.kulib.in/</a>

159	Library, Asian School of Business (ASB), Technocity, Pallipuram, Thiruvananthapuram, KERALA-695316	<a href="http://asbindia.in/library.php">http://asbindia.in/library.php</a>
160	RGNUL Library, Rajiv Gandhi National University of Law (RGNUL) Punjab, Sidhuwal, Bhadson Road, Patiala, PUNJAB-147004	<a href="http://rgnul.ac.in/Library/default.aspx">http://rgnul.ac.in/Library/default.aspx</a>
161	Library, Surat Municipal Institute of Medical Education and Research (SMIMER), Near Sahara Darwaja, Opp. Bombay Market, Umarwada, Surat, GUJARATH-395010	<a href="http://smimer.suratmunicipal.gov.in/content/facilities/library.shtml">http://smimer.suratmunicipal.gov.in/content/facilities/library.shtml</a>
162	Library, India International Centre (IIC), 40, Max Mueller Marg, NEW DELHI-110003	<a href="http://www.iicdelhi.nic.in/User_Panel/UserView.aspx?TypeID=1067">http://www.iicdelhi.nic.in/User_Panel/UserView.aspx?TypeID=1067</a>
163	Library, Rajiv Gandhi University (RGU), Rono Hills, Doimukh, ARUNACHAL PRADESH -791112	<a href="http://www.rgu.ac.in/facilities/library.html">http://www.rgu.ac.in/facilities/library.html</a>
164	Library, Sarah Tucker College (STC), Perumalpuram, Vasantha Nager, Tirunelveli-TAMIL NADU – 627002	<a href="http://www.sarahtuckercollege.in/lib.aspx">http://www.sarahtuckercollege.in/lib.aspx</a>
165	Library, Shri Parshwanath Ummed Jain (S.P.U. (P.G.)) College, Post Box No. - 15, Falna, Pali (District), RAJASTHAN-306116	<a href="http://www.spucollegefalna.com/library.htm">http://www.spucollegefalna.com/library.htm</a>
166	Library, The Institute for Defence Studies and Analyses, 1, Development Enclave, (near USI) Rao Tula Ram Marg, NEW DELHI - 110 010	<a href="http://idsa.in/library.html">http://idsa.in/library.html</a>
167	Smt. Hansa Mehta Library, University Library, The Maharaja Sayajirao University of Baroda, Station Road, Vadodara, GUJARATH-390 002	<a href="http://www.hmlibrary.ac.in">www.hmlibrary.ac.in</a>
168	Learning Resource Center, Advance Institute of Management (AIM),NH-24, Delhi Hapur Bye Pass Road, Ghaziabad, UTTAR PRADESH - 201001	NA
169	Central Library, Library, Barrackpore Rastraguru Surendranath College, 6, Riverside Road & 85, Middle Road, Barrackpore, North 24 Parganas, WEST BENGAL-700120	<a href="http://www.brsnc.org/library_home.asp">http://www.brsnc.org/library_home.asp</a>
170	Learning Centre, Indian Institute of Management Indore (IIM Indore), Prabandh Shikhar, Rau-Pithampur Road, Indore, MADHYA PRADESH-	<a href="http://www.iimdr.ac.in/iimi/index.php/facilities/library">http://www.iimdr.ac.in/iimi/index.php/facilities/library</a>

	453 556	
171	Library, Dr. D. Veerendra Heggade Institute of Management Studies and Research (DVHIMSR), Vidyagiri, Dharwad, KARNATAKA-580 004	<a href="http://jssdvhimsr.com/library/">http://jssdvhimsr.com/library/</a>
172	Central Library, Tezpur University, Napam, Tezpur, Sonitpur, ASSAM-784 028	<a href="http://www.tezu.ernet.in/Library">www.tezu.ernet.in/Library</a>
173	Central Library, PBR Visvodaya Institute of Technology and Science (PBRVITS), Visvodaya Campus, Udayagiri Road, Kavali, S.P.S.R, Nellore, ANDHRA PRADESH-524 201	<a href="http://vitskavali.in/library/">http://vitskavali.in/library/</a>
174	Guindy Campus Library, University Of Madras, Guindy (Opp. Gandhi Mandapam), Chennai, TAMIL NADU-600 025	<a href="http://libgc.unom.ac.in/">http://libgc.unom.ac.in/</a>
175	Library, National Law School of India University (NLS), P.O. Bag 7201, Nagarbhavi, Bangalore, KARNATAKA - 560 072	<a href="https://www.nls.ac.in/index.php?option=com_content&amp;view=article&amp;id=146&amp;Itemid=7">https://www.nls.ac.in/index.php?option=com_content&amp;view=article&amp;id=146&amp;Itemid=7</a>
176	Swami Ramanand Teerth Marathwada University (SRTMU) Library, Vishnupuri, Nanded, MAHARASHTRA - 431 606	<a href="http://www.srtmun.ac.in/Library.aspx">www.srtmun.ac.in/Library.aspx</a>
177	Library, Mahatma Gandhi State Institute of Public Administration, Punjab (MGSIPAP), Institutional Area, Sector-26, CHANDIGARH-160019	<a href="http://www.mgsipap.org/index.php/library">http://www.mgsipap.org/index.php/library</a>
178	Learning Resource Center (LRC), Jaypee University of Information Technology (JUIT), Waknaghat Rd, Waknaghat, HIMACHAL PRADESH - 173234	<a href="http://www.juit.ac.in/lrc/home.php">http://www.juit.ac.in/lrc/home.php</a>
179	Tagore Library, Chitkara University, Pinjore-Barotiwala National Highway (NH-21A), HIMACHAL PRADESH - 174 103	<a href="http://library.chitkarauniversity.edu.in">http://library.chitkarauniversity.edu.in</a>
180	Library, New Law Academy, 2390-B, K.B. Hidaytullah Road, Azam Campus, Camp, Pune, MAHARASHTRA - 411001	<a href="http://www.nlapune.org/library.html">http://www.nlapune.org/library.html</a>
181	Central Library, Scholar's Institute of Technology and Management (SITM), Garchuk, Guwahati, ASSAM-35	<a href="http://sitmguwahati.org/?com=article&amp;id=18">http://sitmguwahati.org/?com=article&amp;id=18</a>
182	Library, Vimal Jyothi Engineering College (VJEC),	<a href="http://www.vjec.ac.in/on-">http://www.vjec.ac.in/on-</a>

	Jyothi Nagar, Chemperi (PO), Kannur, KERALA– 670632	<a href="#">campus/central-facilities/library/</a>
183	Library and Documentation Centre, National University of Educational Planning and Administration (NUEPA), 17-B,Sri Aurobindo Marg, NEW DELHI-110016	<a href="http://www.nuepa.org/libdoc/doccenter.html">http://www.nuepa.org/libdoc/doccenter.html</a>
184	Library and Information Service, Indian cardamom Research Institute (Spices Board), Mailadumpara, Parathode, Munnar-Kumily Highway, Mailadumpara, KERALA – 685554	NA
185	Library, Chetana's Ramprasad Khandelwal Institute of Management and Research (CRKIMR), Survey No. 341, Govt. Colony,Bandra - East, Mumbai, MAHARASHTRA - 400 051	<a href="http://www.crkimr.in/infrastructure.htm">http://www.crkimr.in/infrastructure.htm</a>
186	Central Library, Indian Institute of Technology Mandi (IIT Mandi), Kamand Campus, Kamand P.O., Sadar, Mandi, HIMACHAL PRADESH – 175005	<a href="http://library.iitmandi.ac.in/">http://library.iitmandi.ac.in/</a>
187	Library (Knowledge Management Center), Insurance Institute of India, G Block, Plot No.C-46, Bandra-Kurla Complex, Mumbai, MAHARASHTRA– 400 051	<a href="http://www.coi.org.in/web/guest/lib_revised;jsessionid=2B32B8351B5210479BE0D25BB2948544.jvm2">http://www.coi.org.in/web/guest/lib_revised;jsessionid=2B32B8351B5210479BE0D25BB2948544.jvm2</a>
188	Sirohi District Institute Library, Azim Premji Foundation,Sirohi District Institute, Sirohi Basantkunj, Near Govt. Labour Office, Bhatkada Chouraha, Sirohi, RAJASTHAN – 307 001	<a href="http://azimpremjifoundation.org/library/sirohi">http://azimpremjifoundation.org/library/sirohi</a>
189	Library, Siksha 'O' Anusandhan University (SOA University), Khandagiri Square, Bhubaneswar, ODISHA -	NA
190	H. T. Parekh Library, Institute for Financial Management and Research (IFMR), # 5655, Central Express Way, Sector 24, Sri City, Changambakkam Village, Satyavedu, Chittoor (Dist), ANDHRA PRADESH – 517 541	<a href="http://ifmr.ac.in/library/">http://ifmr.ac.in/library/</a>
191	BB Dikshit Library, All India Institute of Medical Sciences (AIIMS), Gautam Nagar, Ansari Nagar East, New Delhi, NEW DELHI – 110029	<a href="http://www.aiims.edu/aiims/library/library.htm">http://www.aiims.edu/aiims/library/library.htm</a>
192	Library and Information Sciences, Biological	NA



	Sciences, Indian Institute of Science, Bengaluru, KARNATAKA – 560012	
193	British Library, 5-9-22 Sarovar Centre, Secretariat Road, Hyderabad, TELANGANA – 500063	<a href="http://www.britishcouncil.in/programmes/libraries/our-libraries/hyderabad-library">http://www.britishcouncil.in/programmes/libraries/our-libraries/hyderabad-library</a>
194	Library, Indian Institute of Space Science and Technology (IIST), Thiruvananthapuram, KERALA	<a href="http://www.iist.ac.in/facilities/library">http://www.iist.ac.in/facilities/library</a>
195	Knowledge Management Centre, National Institute of Design (NID), Opp Tagore Hall, Paldi, Ahmedabad, GUJARAT – 380007	<a href="http://www.nid.edu/education/knowledge-management-centre/kmc-eresources">http://www.nid.edu/education/knowledge-management-centre/kmc-eresources</a>
196	Lakshminath Bezbaroa Central Library, Indian Institute of Technology Guwahati (IIT Guwahati), Guwahati, ASSAM - 39.	<a href="http://www.iitg.ac.in/lib/">http://www.iitg.ac.in/lib/</a>
197	Library, MAEER's MIT Institute of Design, Rajbag Loni Kalbhore, Next to Hadapasar, Pune, Maharashtra 412201	<a href="http://mitid.edu.in/library.html">http://mitid.edu.in/library.html</a>
198	Library, C.S.I.Institute of Technology (CSIIT) Opp. Anand Theatre, 145, McIntyre Road Secunderabad, TELANGANA	NA
199	Vikram Sarabhai Library, Indian Institute of Management (IIM Ahmedabad), Vastrapur, Ahmedabad, GUJARAT– 380 015	<a href="http://www.iimahd.ernet.in/library/">http://www.iimahd.ernet.in/library/</a>
200	Library & Information Center, Gogte Institute of Technology (GIT), Jnana Ganga, Khanapur Road, Udyambag, Belagavi, KARNATAKA -590008	<a href="http://library.git.edu">http://library.git.edu</a>
201	Learning Resource Centre (LRC), KPR School of Business (KPRSB), Arasur, Coimbatore, TAMIL NADU – 641407	<a href="http://www.kprsb.ac.in/library.html">http://www.kprsb.ac.in/library.html</a>
202	Central Library, Central University of Gujarat, Sector-30, Gandhinagar, GUJARAT – 382030	<a href="http://14.139.122.36/">http://14.139.122.36/</a>
203	Documentation Centre, DLF Ltd., DLF, Building 10B, 2nd Floor, Phase-II, DLF-Cyber City, Gurgaon, HARYANA-122002	NA
204	Library, Institute of Pharmacy, Nirma University, AHMEDABAD – 382481	<a href="http://www.nirmauni.ac.in/IPLib">http://www.nirmauni.ac.in/IPLib</a>
205	Library, Vidyasagar College, 39, Sankar Ghosh Lane, Kolkata, WEST BENGAL-700006	<a href="http://www.vidyasagarcollege.edu.in/contact.html">http://www.vidyasagarcollege.edu.in/contact.html</a>

206	Central Library, BIT Mesra Campus, Birla Institute of Technology, Mesra, Ranchi, JHARKHAND – 835215	<a href="https://bitmesra.ac.in/cms.aspx?this=1&amp;mid=658">https://bitmesra.ac.in/cms.aspx?this=1&amp;mid=658</a>
207	Information Centre for Aerospace Science and Technology (ICAST), CSIR-National Aerospace Laboratories (CSIR-NAL), PB 1779, Bangalore KARNATAKA - 560 017	<a href="http://www.icast.org.in">http://www.icast.org.in</a>
208	Bhai Kahn Singh Nabha Library (BKS N Library), Punjabi University, Patiala, PUNJAB -147002	<a href="http://punjabiversity.ac.in/pbiuniweb/pages/library.html">http://punjabiversity.ac.in/pbiuniweb/pages/library.html</a>
209	Library and Information Resource Center, ITM University, HUDA Sector 23-A Gurgaon, HARYANA- 122017	<a href="http://itmindia.edu/index.php/itm/library/#">http://itmindia.edu/index.php/itm/library/#</a>
210	Library, Environmental Management and Policy Research Institute (EMPRI), Dept. of F.E.E, Government of Karnataka, "Hasiru Bhavana", Forest Campus, Doresanipalya, Vinayakanagara Circle, J.P. Nagar 5th Phase, Bangalore, KARNATAKA - 560 078	NA
211	Library, Kendriya Vidyalaya Kanjikode, Kanjikode West, Palakkad, KERALA - 678 623	<a href="http://kvklibrary.in">http://kvklibrary.in</a>
212	Library, Christ Junior College, Hosur Road, Bangaluru, KARNATAKA -560029	<a href="http://cjc.christcollege.edu/academic-s-library.html">http://cjc.christcollege.edu/academic-s-library.html</a>
213	Anna Centenary Library, Gandhi Mandapam Road, Kottupuram, Chennai, TAMIL NADU-600025	NA
214	Library, Justice Basheer Ahmed Sayeed College For Women (JBAS), No. 56, K B Dasan Road, Teynampet, Chennai, TAMIL NADU – 600018	<a href="http://www.jbascollege.edu.in/library.html">http://www.jbascollege.edu.in/library.html</a>
215	A. C. Joshi Library, Panjab University, Sector 14, CHANDIGARH – 160014	<a href="http://library.puchd.ac.in/">http://library.puchd.ac.in/</a>
216	Central Library, Ajay Kumar Garg Engineering College (AKGEC), 27th Km Milestone, Delhi - Hapur Bypass Road, P.O. Adhyatmik Nagar Ghaziabad, UTTAR PRADESH- 201009	<a href="http://akgec.in/Central-Library/Library.html">http://akgec.in/Central-Library/Library.html</a>
217	Library, IPS Academy Indore, A.B Road, Rajendra Nagar, Indore, MADHYA PRADESH - 452012	<a href="http://www.ipsacademy.org/library.php">http://www.ipsacademy.org/library.php</a>
218	Library, Birla Institute of Technology and Science, Pilani Campsu (BITS-Pilani), Vidya	<a href="http://universe.bits-pilani.ac.in:12354/">http://universe.bits-pilani.ac.in:12354/</a>

	Vihar, Pilani, RAJASTHAN – 333031	
219	Central Library, Anand Institute of Higher Technology (AIHT), Kalasalingam Nagar, Kazhipattur, Kazhipathur, TAMIL NADU-603103	<a href="http://www.aiht.ac.in/AboutLibrary.html">http://www.aiht.ac.in/AboutLibrary.html</a>
220	Library, College of Technology and Engineering, Maharana Pratap University of Agriculture and Technology (MPUAT), University Rd, Ganesh Nagar, Udaipur, RAJASTHAN – 313001	<a href="http://www.ctae.ac.in/index.php?id=5&amp;type=DP">http://www.ctae.ac.in/index.php?id=5&amp;type=DP</a>
221	Knowledge Centre, Angadi Institute of Technology and Management (AITM), Savagaon Road, Belgaum, KARNATAKA -590 009	<a href="http://www.aitmbgm.ac.in/library-information-centre/">http://www.aitmbgm.ac.in/library-information-centre/</a>
222	Library knowledge Centre, Ansal Institute of Technology, Golf Course Road, Sector 55, Gurgaon, HARYANA – 122003	NA
223	Library, Institute for Plasma Research (IPR), Bhat, Near Indira Bridge, Gandhinagar, GUJARAT - 382 428	<a href="http://www.ipr.res.in/~library/aboutlib/lprlib.html">http://www.ipr.res.in/~library/aboutlib/lprlib.html</a>
224	Central Library, Dr. Daulatrao Aher College of Engineering Karad (DACOE), Vidyanagar Extn. Banawadi, Karad, Satara District, MAHARASHTRA – 415124	<a href="http://www.dacoe.ac.in/facilities.php?library=facility">http://www.dacoe.ac.in/facilities.php?library=facility</a>
225	Sir Jehangir Gandhi Library, C. H. Area (East), Jamshedpur, JHARKHAND– 831001	<a href="http://www.xlri.ac.in/resources/resources-overview.aspx">http://www.xlri.ac.in/resources/resources-overview.aspx</a>
226	Library & Information Center (LIS), Federal Institute of Science and Technology (FISAT), Hormis Nagar, Mookkannoor P.O. Angamaly, Ernakulam, KERALA – 683577	<a href="http://www.fisat.ac.in/php/showData.php?linkid=154&amp;headid=9&amp;headtype=Y">http://www.fisat.ac.in/php/showData.php?linkid=154&amp;headid=9&amp;headtype=Y</a>
227	Central Library, Krishna Institute of Engineering and Technology (KIET), 13 KM Milestone, Delhi Meerut Road, Meerut Highway NH-58, Ghaziabad, UTTAR PRADESH- 201206	<a href="http://www.kiet.edu/lib.php?id=lib">http://www.kiet.edu/lib.php?id=lib</a>
228	Maharaja Surajmal Central Library, C-4, Janak Puri, NEW DELHI – 110058	<a href="http://www.msit.in/index.php/2013-01-16-19-04-11/library">http://www.msit.in/index.php/2013-01-16-19-04-11/library</a>
229	Library, Kurukshetra University, Kurukshetra, HARYANA - 136119	<a href="http://www.kuk.ac.in/information.php?m=dg==&amp;L01_id=NjE=&amp;L01_direction=H">http://www.kuk.ac.in/information.php?m=dg==&amp;L01_id=NjE=&amp;L01_direction=H</a>

230	Central Digital Library (CDL), Shree Ganpati Institute of Technology (SGIT), Opp. Jindal Pipes Ltd, NH-24, Jindal Nagar, Ghaziabad, UTTAR PRADESH -201302	<a href="http://www.sgit.ac.in/library.php">http://www.sgit.ac.in/library.php</a>
231	Library, Mahakal Institute of Technology (MIT), Behind Air Strip, Dewas Road, Ujjain, MADHYA PRADESH -456664	<a href="http://www.mitujain.ac.in/Facilities/library.html">http://www.mitujain.ac.in/Facilities/library.html</a>
232	Central Library, United Institute of Technology (UIT)Path to Main Block, G. Koundampalayam, Periyanaickenpalayam, Coimbatore, TAMIL NADU -641020	<a href="http://uit.ac.in/library.html">http://uit.ac.in/library.html</a>
233	Library, Kendriya Vidyalaya Khammam, Polepalli (Village), Opposite Karunagiri, Sai Temple Road, Khammam, ANDHRA PRADESH-507003	NA
234	Learning Resource Centre (LRC), Indian School of Business (ISB), Knowledge City, Sector 81, SAS Nagar, Mohali, PUNJAB -140 306	NA
235	Library, Narayana Hrudayalaya Hospitals, Narayana Multispeciality Hospital,CAH/1, 3rd Phase, Devanur, Mysouru, KARNATAKA -570 019	NA
236	Library, Ganga Institute of Technology and Management (GITAM), 4/12, East Punjabi Bagh, NEW DELHI -26	<a href="http://gangainstitute.com/library/">http://gangainstitute.com/library/</a>
237	Library, Sri Sarada College for Women, Sarada Nagar, Ariakulam, Tirunelveli, TAMIL NADU - 627011	<a href="http://srisaradacollege.org/library.php">http://srisaradacollege.org/library.php</a>
238	Library, Jankidevi Bajaj College of Science, Jamnalal Bajaj Marg,Civil Lines, MIDC, Wardha, MAHARASHTRA - 442001	NA
239	Central Library, Kalasalingam University,Anand Nagar, Krishnankoil, TAMIL NADU - 626 126	<a href="http://kalasalingam.ac.in/site/academics-2/library/">http://kalasalingam.ac.in/site/academics-2/library/</a>
240	C. H. Mohammed Koya Library, University of Calicut, Calicut University P.O., Malappuram, KERALA - 673635	<a href="http://library.universityofcalicut.info/">http://library.universityofcalicut.info/</a>
241	Library, Indian Institute of Astrophysics (IIAP), II Block, Koramangala, Bengaluru, KARNATAKA -	<a href="http://www.iiap.res.in/facilities/library">http://www.iiap.res.in/facilities/library</a>

	560 034	
242	Library, Department of Mathematics, University of Calicut, Calicut University P.O., Malappuram, KERALA – 673635	NA
243	Central Library, Maharashtra Institute of Medical Sciences and Research (MIMSR), Medical College and Yeshwantrao Chavan Rural Hospital, Vishwanathpuram, Ambajogai Road, Latur, MAHARASHTRA - 413 531	<a href="http://mimsr.ac.in/index.php?option=com_content&amp;view=article&amp;id=239&amp;Itemid=278">http://mimsr.ac.in/index.php?option=com_content&amp;view=article&amp;id=239&amp;Itemid=278</a>
244	Library, CSIR-National Institute of Science, Technology and Development Studies (NISTADS), Dr KS Krishnan Marg, New Rajinder Nagar, NEW DELHI -	<a href="http://www.nistads.res.in/index.php/library">http://www.nistads.res.in/index.php/library</a>
245	Library, Pondicherry Engineering College (PEC), Pillaichavadi, Puducherry, TAMIL NADU - 605 014	NA
246	Annamalai University Library, Annamalai Nagar, Chidambaram, TAMIL NADU – 608002	<a href="http://annamalaiuniversity.ac.in/mainlib.php">http://annamalaiuniversity.ac.in/mainlib.php</a>
247	Library, Kohinoor Business School, Kohinoor Education Complex, Kohinoor City, Kirod Road, Kurla (W), Mumbai, MAHARASHTRA -	<a href="http://library.kohinoor.edu.in/">http://library.kohinoor.edu.in/</a>
248	Library, Vallabhbhai Patel Chest Institute (VPCI), University of Delhi, NEW DELHI– 110007	<a href="http://vpcl.org.in/pageLevel.php?id=8&amp;cat=implinks&amp;subid=63&amp;subcat=implinks_sublinks">http://vpcl.org.in/pageLevel.php?id=8&amp;cat=implinks&amp;subid=63&amp;subcat=implinks_sublinks</a>
249	Library, Archaeological Survey of India (ASI), Chennai Circle, Fort St George, Chennai, TAMIL NADU – 600009	NA
250	Library, Department of Library and Information Science, Dravidian University, Srinivasa Vanam, Chittoor Dist., Kuppam, ANDHRA PRADESH - 517 425	<a href="http://www.dravidianuniversity.ac.in/dept-library.php">http://www.dravidianuniversity.ac.in/dept-library.php</a>
251	Library, Institute of Technology, Nirma University, Sarkhej-Gandhinagar Highway, Chandlodia Post, Gota, Ahmedabad, GUJARAT – 382481	<a href="http://www.nirmauni.ac.in/itlib">http://www.nirmauni.ac.in/itlib</a>
252	Library, Bineswar Brahma Engineering College (BBEC), Bijuleebari, Chandrapara, ASSAM -	NA

	783370	
253	Central Library, Fr. C. Rodrigues Institute of Technology, Agnel Technical Education Complex, Sector 9-A, Vashi, Navi Mumbai, MAHARASHTRA -400703	<a href="http://www.fcrit.ac.in/infrastructure/">http://www.fcrit.ac.in/infrastructure / -</a>
254	Central Library, Dharmaram Vidya Kshetram (DVK), Bengaluru, KARNATAKA -560 029	<a href="http://dvk.in/centrallibrary.aspx">http://dvk.in/centrallibrary.aspx</a>
255	Library, Shri Dharmasthala Manjunatheshwara Institute for Management Development (SDMIMD Library), Siddharthanagar, Mysuru, KARNATAKA -	<a href="http://www.sdmimd.ac.in/library">http://www.sdmimd.ac.in/library</a>
256	Library, Information and Library Network (INFLIBNET), Inflibnet Centre Rd, Infocity, Gandhinagar, GUJARAT- 382007	<a href="http://inflibnet.ac.in/library/">http://inflibnet.ac.in/library/</a>
257	Central Library, Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur, CHHATTISGARH-495009	<a href="http://www.ggu.ac.in/central_library.html">http://www.ggu.ac.in/central_library.html</a>
258	Central Library, Maharaj Vijayaram Gajapati Raj College of Engineering (MVGR College of Engineering), Vijayaram Nagar Campus, Chintalavalasa, ANDHRA PRADESH – 535005	<a href="http://www.mvgrce.edu.in/">http://www.mvgrce.edu.in/</a>
259	Learning Resource Centre (LRC), Suamandeep Vidyapeeth University, Pipariya, Waghodia, Vadodara, GUJARAT – 391760	<a href="http://sumandeepuniversity.co.in/index.php?option=com_content&amp;view=article&amp;id=130&amp;Itemid=1109&amp;lang=en">http://sumandeepuniversity.co.in/index.php?option=com_content&amp;view=article&amp;id=130&amp;Itemid=1109&amp;lang=en</a>
260	Central Library, University of Agricultural Sciences Raichur (UAS Raichur), Post Box No: 329, UAS Campus, Lingsugur Road, Raichur, KARNATAKA -584 102	<a href="http://www.uasraichur.edu.in/uasrmmain.php?mainpage=studentpage&amp;subpage=facilities#">http://www.uasraichur.edu.in/uasrmmain.php?mainpage=studentpage&amp;subpage=facilities#</a>
261	Library & Information Centre, College of Engineering Vadakara (Formerly Co-operative Institute of Technology), Mandarathur P.O, Vadakara, Kozhikode, KERALA - 673 105	<a href="http://citv.ac.in/Infra.htm">http://citv.ac.in/Infra.htm</a>
262	Justice T.P.S. Chawla Library, National Law University Delhi, Sector-14, Dwarka, NEW DELHI -110078	<a href="http://justicetpschawlalibrary.webs.com/">http://justicetpschawlalibrary.webs.com/</a>
263	Central Library, Yenepoya University, University	<a href="http://www.yenepoya.edu.in/colleges">http://www.yenepoya.edu.in/colleges</a>

	Road, Deralakatte, Mangalore, KARNATAKA – 575018	<a href="#">.php?id=44&amp;org=center</a>
264	National Library of India, Belvedere Rd, Alipore, Kolkata, WEST BENGAL – 700027	<a href="http://www.nationallibrary.gov.in/">http://www.nationallibrary.gov.in/</a>
265	HCE Library, Harkamaya College of Education, Samdur, Tadong, Gangtok, SIKKIM – 737102	<a href="http://www.hcesikkim.org/facilities.html">http://www.hcesikkim.org/facilities.html</a>
266	Central Library, Vidya Academy of Science & Technology, P.O. Thalakkottukara, Thrissur, KERALA -680 501	<a href="http://www.vidyaacademy.ac.in/content/central-library">http://www.vidyaacademy.ac.in/content/central-library</a>
267	Library, Bhusawal Arts, Science and P.O. Nahata Commerce College Library, Jalgaon, MAHARASHTRA	<a href="http://basponccollege.org/Library/Library_HomePage.aspx">http://basponccollege.org/Library/Library_HomePage.aspx</a>
268	Central Library, Central University of Rajasthan, NH-8, Bandar Sindri, Ajmer District, RAJASTHAN – 305817	<a href="http://curaj.ac.in/Default.aspx?PageId=90">http://curaj.ac.in/Default.aspx?PageId=90</a>
269	Library, Gujarat vidyapith, Nr. Income Tax Office, Ashram Road, Ahmedabad, GUJARAT – 380014	<a href="http://gujaratvidyapith.org/centrallibrary.htm">http://gujaratvidyapith.org/centrallibrary.htm</a>
270	Library, Vignana Bharathi Institute of Technology (VBIT), Aushapur, Ghatkesar, RR. District, Near HPCL, Hyderabad, TELANGANA – 501301	<a href="http://vbithyd.ac.in/library/library-over-view/">http://vbithyd.ac.in/library/library-over-view/</a>
271	Library, Tolani College of Commerce, 150-151, Tolani Naka, Sher E Punjab Society, Guru Gobind Singh Marg, Andheri East, Mumbai, MAHARASHTRA – 400093	<a href="http://www.tolani.edu/tcc/index,92.html#Library">http://www.tolani.edu/tcc/index,92.html#Library</a>
272	Library and Resource Centre, GD Goenka University Gurgaon Sohna, Sohna-Gurgaon Road, Gurgaon, HARYANA – 122103	NA
273	Central Library, Amity University, Gomti Nagar, Viraj Khand, Lucknow, UTTAR PRADESH – 226001	<a href="http://www.amity.edu/admission/photo_library.asp">http://www.amity.edu/admission/photo_library.asp</a>
274	Library, International Institute for Population Sciences (IIPS), Govandi Station Road, Deonar, Mumbai, MAHARASHTRA - 400 088	<a href="http://iipsindia.org/library.htm">http://iipsindia.org/library.htm</a>
275	Library, Chandmal Tarachand Bora College (C.T. Bora College), Pune-Nagar Highway, Shirur (Ghodnadi), Pune, MAHARASHTRA – 412210	<a href="http://www.ctboracollege.edu.in/index.php/library">http://www.ctboracollege.edu.in/index.php/library</a>

276	Central Library, Indian Institute of Technology Jodhpur (IIT Jodhpur), Old Residency Road, Ratanada, Jodhpur, RAJASTHAN- 342011	<a href="http://library.iitj.ac.in">http://library.iitj.ac.in</a>
277	Chettinad TECh Central Library, NH-67, Karur - Trichy Highways, Puliyur CF, Karur, TAMIL NADU - 639114	<a href="http://www.chettinadtech.ac.in/lib">www.chettinadtech.ac.in/lib</a>
278	SRKVCOE Libray , Sri Ramakrishna Mission Vidyalaya, College of Education, SRKV Post, Coimbatore, TAMIL NADU - 641020	<a href="http://srkvcoe.org/Library.htm">http://srkvcoe.org/Library.htm</a>
279	Dr. V K R V Rao Library, Institute for Social and Economic Change (ISEC), Dr. V K R V Rao Road, Nagarabhavi PO, Bengaluru, KARNATAKA -560 072	<a href="http://www.isec.ac.in/librarymain.htm">http://www.isec.ac.in/librarymain.htm</a>
280	Library, Mata Sundri College for Women, University of Delhi, Mata Sundri Lane, NEW DELHI -110002	<a href="http://ms.du.ac.in/library1.htm">http://ms.du.ac.in/library1.htm</a>
281	Library, Inter-University Centre for Astronomy and Astrophysics (IUCAA), Post Bag 4, Ganeshkhind, Pune University Campus, Pune, MAHARASHTRA - 411 007	<a href="http://www.iucaa.ernet.in/~library/">http://www.iucaa.ernet.in/~library/</a>
282	Central Library, Government Engineering College (GEC), Mananthavady, Wayanad, KERALA - 670644	<a href="http://www.gecwyd.ac.in/index.php/facility/library">http://www.gecwyd.ac.in/index.php/facility/library</a>
283	Prof. G. K. Chadha Library (South Asian University Library-SAU Library), Akbar Bhawan (Ground Floor), Chanakyapuri, NEW DELHI - 110021	<a href="http://library.sau.ac.in">http://library.sau.ac.in</a>
284	Dhananjayarao Gadgil Library, Gokhale Institute of Politics and Economics (GIPE), 846, Shivaji Nagar, BMCC Rd, Deccan Gymkhana, Pune, MAHARASHTRA - 411004	<a href="http://www.gipe.ac.in/library">http://www.gipe.ac.in/library</a>
285	Library, Haryana Institute of Engineering & Technology, Ambala Road, Kaithal, HARYANA- 136027	<a href="http://www.hietkaithal.com/dlib.html">http://www.hietkaithal.com/dlib.html</a>
286	Library, Lala Lajpatrai Institute of Management, Lala Lajpatrai Marg, Mahalaxmi, Mumbai, MAHARASHTRA -400 034	<a href="http://www.llim.edu/Library.asp">http://www.llim.edu/Library.asp</a>



287	University Library, Central University of Kerala, Tejaswini Hills Campus, Periyar, Bekal Fort Via, Kasaragod, KERALA – 671316	<a href="http://cukerala.ac.in/index.php?option=com_content&amp;view=article&amp;id=112&amp;Itemid=182&amp;lang=en">http://cukerala.ac.in/index.php?option=com_content&amp;view=article&amp;id=112&amp;Itemid=182&amp;lang=en</a>
288	Central Library, Mizoram University, Tanhril, P.O Box No. 190, Aizawl, MIZORAM – 796009	<a href="http://www.mzu.edu.in/index.php/facilities/central-library">http://www.mzu.edu.in/index.php/facilities/central-library</a>
289	Library, Muthoot Institute of Technology and Science (MITS), Kochi-Madurai-Tondi Point Highway, Varikoli P.o, Puthencruz, Ernakulam, KERALA – 682308	<a href="http://mgmits.com/facilities.html">http://mgmits.com/facilities.html</a>
290	Library, Matigara Harasundar High School, Matigara, Siliguri, WEST BENGAL – 734010	NA
291	Rabindra Library (Central Library), Assam University, Silchar, ASSAM - 788 011	<a href="http://www.aus.ac.in/library.html">http://www.aus.ac.in/library.html</a>
292	Sant Dhyaneswar Library, Law College, Vidya Nagar, Tambri Vibhag, Osmanabad, MAHARASHTRA – 413501	<a href="https://sites.google.com/site/lawcollegelibraryosmanabad/home">https://sites.google.com/site/lawcollegelibraryosmanabad/home</a>
293	Dr.T.P.M.Library, Madurai Kamaraj University, Palkalai Nagar, Madurai, TAMIL NADU – 625021	<a href="http://www.mkulibrary.org/">http://www.mkulibrary.org/</a>
294	Sir Dorabji Tata Memorial Library, Tata Institute of Social Sciences (TISS), V. N. Purav Marg, P.B.No.8313, Deonar, Mumbai, MAHARASHTRA -400 088	<a href="http://library.tiss.edu/">http://library.tiss.edu/</a>
295	Library, Azim Premji Foundation, Udham Singh Nagar District Institute, Rudrapur, Above State Bank Of India, Sidcul Branch, D1, D2 Civil Lines, Nainital Road, Rudrapur, Udham Singh Nagar, UTTARAKHAND -26315	<a href="http://azimpremjifoundation.org/library/usnagar">http://azimpremjifoundation.org/library/usnagar</a>
296	Library Information Centre (Sri T.N. Kempahonnaiah Library), Siddaganga Institute of Technology (SIT), B. H. Road, Tumakuru, KARNATAKA – 572103	<a href="http://www.sit.ac.in/departments/lib/lib.html">http://www.sit.ac.in/departments/lib/lib.html</a>
297	Library, AISSMS College of Engineering (AISSMS-All India Shri Shivaji Memorial Society), 1, Kennedy Road, Pune, MAHARASHTRA – 411001	<a href="http://www.aiissmscoe.com/library.htm">http://www.aiissmscoe.com/library.htm</a>
298	Library, Government First Grade College, Ramdurg, Belgam, KARNATAKA -591 123	NA

299	Library (Readers Paradise), Gujarat Power Engineering and Research Institute (GPRI), Near Toll Booth, Ahmedabad-Mehsana Expressway, Mewad, Mehsana, GUJARAT – 382710	<a href="http://gperi.ac.in/library.html">http://gperi.ac.in/library.html</a>
300	Central Library, Dr. B. R. Ambedkar University, Paliwal Park, Agra, UTTAR PRADESH – 282004	<a href="http://www.dbrau.ac.in/library.html">http://www.dbrau.ac.in/library.html</a>
301	Library, The National Institute Of Engineering (NIE), Mananthody Road, Mysuru, KARNATAKA – 570008	<a href="http://www.nie.ac.in/library/">http://www.nie.ac.in/library/</a>
302	Library, Administrative Training Institute (ATI), Lalitha Mahal Road, Mysuru, KARNATAKA -570 011	<a href="http://atilibrary/atilib/">http://atilibrary/atilib/</a>
303	Library, Kuvempu Institute of Kannada Studies, University of Mysore, Manasa Gangothiri, Mysuru, KARNATAKA -	NA
304	Library, Raman Research Institute (RRI), C. V. Raman Avenue, Sadashivanagar, Bangalore, KARNATAKA - 560 080	<a href="http://www.rri.res.in/library.html">http://www.rri.res.in/library.html</a>
305	J N Libray, University of Mumbai, Vidyangari, Kalina, Santacruz (E), Mumbai, MAHARASHTRA -400 092	<a href="http://www.mu.ac.in/Library/index.html">http://www.mu.ac.in/Library/index.html</a>
306	Library, Acharya Institutes, Acharya Dr. Sarvepalli Radhakrishnan Road, Acharya Post Office, Bengaluru, KARNATAKA -560 107	NA
307	Sarah Chakko Memorial Library, Isabella Thoburn College (ITC), 7, Faizabad Road, Lucknow, UTTAR PRADESH – 226007	<a href="http://itcollege.ac.in/library-2/">http://itcollege.ac.in/library-2/</a>
308	Library & Information Centre, Maharaja Institute of Technology (MIT), Belawadi, Srirangapatna Tq, Mandya, KARNATAKA – 571438	<a href="http://www.mitmysore.in/Library_MIT.html">http://www.mitmysore.in/Library_MIT.html</a>
309	Library, H R College of Commerce & Economics, 123, Dinshaw Wachha Road, Churchgate, Mumbai, MAHARASHTRA – 400020	<a href="http://www.hrcollege.edu/web/library_web.php">http://www.hrcollege.edu/web/library_web.php</a>
310	Library, Maharaja's College, University of Mysore, Mysore, KARNATAKA – 570006	NA
311	Resource Centre, National Institute of Fashion Technology (NIFT), Opp-Hitech City, Madhapur, Hyderabad, TELANGANA-500081	<a href="http://nift.ac.in/hyderabad/rc.html">http://nift.ac.in/hyderabad/rc.html</a>

312	Library & Information Systems & Services, Indian Institute of Information Technology and Management-Kerala (IITM-Kerala), IITM-K Building, Techno park Campus, Thiruvananthapuram, KERALA - 695 581	<a href="http://iiitmk.ac.in/iiitmk-services/library-services">http://iiitmk.ac.in/iiitmk-services/library-services</a>
313	Library, P.B. College of Engineering, Irungkattukottai, Sriperumbudur Taluk, Kanchipuram, TAMIL NADU – 602105	NA
314	Library, Government First Grade College (GFGC), Kushal Nagar, Mullusoge, KARNATAKA - 571234	NA
315	Library, Ram Lal Anand College (RLA), Benito Juarez Road, NEW DELHI - 110 021	NA
316	Laxmiben Thackersey Library, Sir Vithaldas Thackersey College of Home Science, S. N. D. T. , Women's University, Juhu, Mumbai, MAHARASHTRA – 400049	<a href="http://www.svt.edu.in/htm/library.html">http://www.svt.edu.in/htm/library.html</a>
317	V.M.Rao Memorial Library, A. G. & S. G. Siddhartha Degree College of Arts & Science, College Road, Vuyyuru, Krishna District, Vuyyuru, ANDHRA PRADESH-521165	<a href="http://www.agsgsc.edu.in/facilities/library">http://www.agsgsc.edu.in/facilities/library</a>
318	Central Library, Alliance University, Chikkahagade Cross, Chandapura - Anekal Main Road, Anekal, Bengaluru, KARNATAKA - 562106	<a href="http://www.alliance.edu.in/au/library.php">http://www.alliance.edu.in/au/library.php</a>
319	Library & Information Centre (LIC), Indian Institute of Management Kozhikode (IIMK), IIMK Campus P. O., Kozhikode, KERALA -673 570	<a href="http://www.iimk.ac.in/libportal/">http://www.iimk.ac.in/libportal/</a>
320	Sahitya Akademi Library, Rabindra Bhavan, 35, Ferozeshah Road, NEW DELHI – 110001	<a href="http://sahitya-akademi.gov.in/sahitya-akademi/library/library.jsp">http://sahitya-akademi.gov.in/sahitya-akademi/library/library.jsp</a>
321	Library, Malabar Cancer Centre, Moozhikkara, Kodyeri, Thalassery, Kannur, KERALA -670103	NA
322	Central Library, B. S. Abdur Rahman University, G.S.T Road, Vandalur, Chennai, TAMIL NADU – 600 048	<a href="https://librarybsau.wordpress.com/">https://librarybsau.wordpress.com/</a>

323	Library, International Institute of Health Management Research (IIHMR), Plot no. 3, HAF Pocket, Sector 18A, Phase-II, Dwarka, Near Veer Awas/Kargil Apartment Sector- 12 Metro Stations, NEW DELHI – 110075	<a href="http://iihmrdelhi.org/library2/index.html">http://iihmrdelhi.org/library2/index.html</a>
324	Library, Maharashtra Animal & Fishery Sciences University (MAFSU), Futala Lake Road, Nagpur, MAHARASHTRA - 440 001	<a href="http://www.mafsu.in/Services_Library.aspx">http://www.mafsu.in/Services_Library.aspx</a>
325	Library, National Institute of Oceanography (NIO),Regional Centre,Dr Salim Ali Road, Post Box No. 1913,Kochi, KERALA - 682 018	<a href="http://www.nio.org/nicmas/Nicmas.jsp">http://www.nio.org/nicmas/Nicmas.jsp</a>
326	B. C. Roy Memorial Library, Indian Institute of Management calcutta(IIM Calcutta), Diamond Harbour Road, Joka, Kolkata, WEST BENGAL – 700104	<a href="http://library.iimcal.ac.in/">http://library.iimcal.ac.in/</a>
327	Central Secretariat Library (CSL), MOC, Shastri Bhawan, NEW DELHI – 110001	<a href="http://www.csl.nic.in">www.csl.nic.in</a>
328	Library, Park Global School of Business Excellence (PGSBE), Greams Lane, Thousand Lights, Chennai, TAMIL NADU – 600006	NA
329	Library, Sanskar Sarjan Education Society's Dhirajlal Talakchand Sankalchand Shah College of Commerce & Science & P.D. Turakhia Junior College of Commerce & Science (DTSS Library), Kurar, Malad (E),Mumbai, MAHARASHTRA – 400097	<a href="http://www.sanskarsarjan.org/departments-LIBRARY.html">http://www.sanskarsarjan.org/departments-LIBRARY.html</a>
330	Central Library, Tecnia Group of Institutions, 3, PSP, Institutional Area, Madhuban Chowk, Rohini, NEW DELHI -110085	NA
331	Library, National Institute of Epidemiology (NIE) (ICMR),Second Main Road,Tamil Nadu Housing Board,Ayapakkam, Near Ambattur, Chennai, TAMIL NADU - 600 077	<a href="http://www.nie.gov.in/leftcontent.php?lmid=Mw==&amp;lcont_id=MTM=">http://www.nie.gov.in/leftcontent.php?lmid=Mw==&amp;lcont_id=MTM=</a>
332	Ajit Gulabchand Central Library,Walchand College of Engineering, Vishrambag, Sangli, MAHARASHTRA – 416 415	<a href="http://www.walchandsangli.ac.in/SupportDepartments/Library.asp">http://www.walchandsangli.ac.in/SupportDepartments/Library.asp</a>
333	Central Library, Trident Group of Institutions,NH-58, Delhi Meerut Road, Near	<a href="http://www.trident.edu.in/central%20_library.html">http://www.trident.edu.in/central%20_library.html</a>

	Manan Dham Temple, Ghaziabad, UTTAR PRADESH – 201003	
334	Mukta Library, Whistling Woods International, 4th Floor, Film City Complex, Goregaon East, Mumbai, MAHARASHTRA – 400065	<a href="http://www.thelibrary.net.in/">http://www.thelibrary.net.in/</a>
335	Central Library, IFET College of Engineering, IFET Nagar, Gangarampalayam, Valavanur Post, Villupuram, TAMIL NADU -605 108	<a href="http://www.ifet.ac.in/campus-facilities-library.php">http://www.ifet.ac.in/campus-facilities-library.php</a>
336	Learning Resource Centre (LRC), Tech Mahindra Limited, Sharda Centre Off Karve Road, Pune, MAHARASHTRA – 411004	NA
337	Central library, Gulbarga University, Gulbarga, KARNATAKA – 585106	<a href="http://www.guglibrary.net">www.guglibrary.net</a>
338	Rosa Mystica Library, Fatima College, Mary Land, Madurai, TAMIL NADU - 625 018	<a href="http://www.fatimacollegemdu.org/menu_pg.php?id=69&amp;s_id=381">http://www.fatimacollegemdu.org/menu_pg.php?id=69&amp;s_id=381</a>
339	Library, Medanta Hospital, Global Health Private, Ltd, Sector 38, CH Bakhtawar Singh Road, Islampur Colony, Near Rajiv Chowk, Gurgaon, HARYANA -122 001	NA
340	Library, K.S. School of Business Management, Gujarat University, Navrangpura, Ahmedabad, GUJARAT – 380009	<a href="http://ksschool.org.in/about-ks/infrastructure.php">http://ksschool.org.in/about-ks/infrastructure.php</a>
341	Library, Udayanath Autonomous College of Science and Technology, Prachi Jnanapitha, Adaspur, Cuttack, ODISHA – 754011	<a href="http://udayanathcollege.org.in/?page_id=60">http://udayanathcollege.org.in/?page_id=60</a>
342	Learning Resource Center, Government First Grade College (GFGC), Church Road, Sirsi, Uttara Kannada, KARNATAKA - 581 401	NA
343	Central Library, Indian Institute of Science Education and Research (IISER) Bhopal, Indore By-pass Road, Bhauri, Bhopal, MADHYA PRADESH – 462066	<a href="https://www.iiserb.ac.in/page.php?page=Central%20Library&amp;pid=54">https://www.iiserb.ac.in/page.php?page=Central%20Library&amp;pid=54</a>
344	Library, Kingston Engineering College, Chittoor Main Road, Katpadi, Vellore, TAMIL NADU - 632 059	<a href="http://kingston.ac.in/file/library.php">http://kingston.ac.in/file/library.php</a>
345	RCBS Libraries, Rajagiri Centre for Business Studies (RCBS), Rajagiri Valley P.O. Kakkanad, Kochi, Ernakulam, KERALA -682 039	<a href="http://rsom.weebly.com/">http://rsom.weebly.com/</a>

346	Knowledge Resource Center, Central Leather Research Institute (CLRI), Adyar, Chennai, TAMIL NADU – 600020	<a href="http://www.clri.org/Departments.aspx?id=2">http://www.clri.org/Departments.aspx?id=2</a>
347	Knowledge Resource Centre Publication (KRC), CSIR-Central Institute of Medicinal and Aromatic Plants (CIMAP),P.O-CIMAP,Near Kukrail Picnic Spot, Lucknow, UTTAR PRADESH – 226015	NA
348	Library, The Indian Public School DP Library, No. 1, Nehru Nagar,1st Main Road, Perungudi,Chennai, TAMIL NADU –600 096	<a href="http://www.theindianpublicschool.org/library.html">http://www.theindianpublicschool.org/library.html</a>
349	Library, Advanced Data Processing Research Institute (ADRIN), 203, Akbar Road, Tarbundi, Manovikasnagar P.O, Secunderabad, TELANGANA -500 009	Not available as a security measure
350	Library, Indian Institute of Science Education and Research (IISER),Pune, Pashan Rd, Pashan, Pune, MAHARASHTRA – 411008	<a href="http://www.iiserpune.ac.in/~library/">http://www.iiserpune.ac.in/~library/</a>
351	Library and Documentation Division (Central Library), Devi Ahilya Vishwavidyalaya (DAVV), Khandwa Road, Indore, MADHYA PRADESH - 452017	NA
352	Library and Documentation Division (LDD), Liquid Propulsion Systems Centre, Indian Space Research Organisation, Valiamala, Thiruvananthapuram, KERALA -695 547	NA
353	Central Reference Library, Government of India, Department of Culture, Belvedere, Kolkata, WEST BENGAL - 700 027	<a href="http://crlindia.gov.in/">http://crlindia.gov.in/</a>
354	Central Library, Indian Institute of Technology Gandhinagar (IIT Gandhinagar), V G E Complex Chandkheda, Visat-Gandhinagar Highway,Ahmedabad, GUJARAT -382 424	<a href="http://www.iitgn.ac.in/library.htm">http://www.iitgn.ac.in/library.htm</a>
355	Central Library, National Institute of Technology,Kurukshetra (NIT Kurukshetra), Kurukshetra, HARYANA– 136119	<a href="http://www.nitkkr.ac.in/pagesUI/homePage.jsf?pageEvent=50&amp;page=content&amp;language=2">http://www.nitkkr.ac.in/pagesUI/homePage.jsf?pageEvent=50&amp;page=content&amp;language=2</a>
356	Library, Reserve Bank of India (RBI) , Shahid Bhagat Singh Rd, Fort, Mumbai, MAHARASHTRA	<a href="https://library.rbi.org.in/">https://library.rbi.org.in/</a>

	- 400001	
357	Library & Information Centre, Vivekananda Institute of Technology (VKIT), Gudimavu, Kumbalagodu Post, Kengeri Hobli, Bengaluru, KARNATAKA – 560055	<a href="http://www.vkitlibrary.com">www.vkitlibrary.com</a>
358	Library, Indira Gandhi Institute of Physical Education & Sports Sciences (IGIPES), B-Block, Vikaspuri, NEW DELHI – 110018	NA
359	Knowledge Resource Centre (KRC), Central Electrochemical Research Institute (CERI), Karaikudi, TAMIL NADU – 630006	<a href="http://krc.cecri.res.in/imp.html">http://krc.cecri.res.in/imp.html</a>
360	Learning Resource Centre, Kendriya Vidyalaya (KVS) Karimganj, Nilmani Road, Karimganj, ASSAM – 788710	NA
361	Library, Gujarat Institute of Development Research (GIDR), Gota, Ahmedabad, GUJARAT – 380060	<a href="http://www.gidr.ac.in/library.php">http://www.gidr.ac.in/library.php</a>
362	South Delhi Campus Library, Benito Juarez Road, University of Delhi, NEW DELHI - 110 021	<a href="http://crl.du.ac.in/sdcl/">http://crl.du.ac.in/sdcl/</a>
363	Library, Central Institute of Plastics Engineering & Technology (CIPET), Plot No. 630, Phase-IV, GIDC, Vatva, Ahmedabad, GUJARAT – 382445	<a href="http://www.cipet.gov.in/academic/library.html">http://www.cipet.gov.in/academic/library.html</a>
364	Library and Information Centre, Basaveshwara Engineering College, Vidaygiri, Bagalkote, KARNATAKA – 587102	<a href="http://www.becbgk.edu/library.php">http://www.becbgk.edu/library.php</a>
365	Library, Indian Institute of Management Ranchi (IIM Ranchi), Suchana Bhawan, 5th Floor, Audrey House Campus, Meur's Road, Ranchi, JHARKHAND – 834 008	<a href="http://www.iimranchi.ac.in/?page_id=195">http://www.iimranchi.ac.in/?page_id=195</a>
366	Library, Teegala Krishna Reddy Engineering College (TKR Engineering College), Medbowli, Meerpet, Saroornagar, Hyderabad, TELANAGANA -500 097	<a href="http://tkrec.ac.in/library.html">http://tkrec.ac.in/library.html</a>
367	Learning Resource Centre (LRC), Thakur College of Science and Commerce, Thakur Village, Kandivli (E), Mumbai, MAHARASHTRA – 400101	<a href="https://tcsclibrary.wordpress.com/">https://tcsclibrary.wordpress.com/</a>

368	Library, Aryanet Institute of Technology, Velikkad, Mundur, Palakkad, KERALA – 678592	NA
369	Library, Mount Tabor Training College, Pathanapuram, Kollam, KERALA -689 695	<a href="http://www.mounttaborcollege.edu.in/library.html">http://www.mounttaborcollege.edu.in/library.html</a>
370	Library, Alard Institute of Management Sciences (AIMS), S.No. 50, Marunje, Rajiv Gandhi Infotech Park, Pune, MAHARASHTRA – 411001	<a href="http://www.alardinstitutespune.com/about/Infrastructure.php">http://www.alardinstitutespune.com/about/Infrastructure.php</a>
371	Knowledge Resource Center, (Central Library), Charotar University of Science and Technology (CHARUSAT), Chandubhai S Patel Institute of Technology, Changa Post, Petlad, Anand District, GUJARAT -388 421	<a href="http://www.charusat.ac.in/CITC_UI/Content.aspx?ID=4&amp;pOpen=0">http://www.charusat.ac.in/CITC_UI/Content.aspx?ID=4&amp;pOpen=0</a>
372	Central Library, Cape Institute of Technology, Levengipuram, Near Azhagappapuram, PO-Rajakrishnapuram, Tirunelveli, TAMIL NADU - 627114	NA
373	J.M.Patel College Library, Sanskardham Kelavani Mandal Jashbhai Maganbhai Patel College of Commerce, Off: M.G Road, Near Aazad Maidan, Goregaon (w), Mumbai, MAHARASHTRA – 90	<a href="http://www.jmpcollege.org/library.asp">http://www.jmpcollege.org/library.asp</a>
374	Dr.Raja Ramanna Centre for Knowledge Resources, Don Bosco Institute of Technology, Bengaluru, KARNATAKA – 560060	<a href="http://www.dbit.co.in/library_information.html">http://www.dbit.co.in/library_information.html</a>
375	Central Library, Aditya Institute of Technology & Management (AITAM), K.Kotturu Village, Tekkali, Srikakulam, ANDHRA PRADESH - 532201	<a href="http://www.adityatekkali.edu.in/library.php">http://www.adityatekkali.edu.in/library.php</a>
376	Central Library (Gaya Campus), Central University of Bihar, House No - 16/13, Ward No – 9A, New 38 Area, Bisar, Gaya, BIHAR – 823 001	<a href="http://cub.ac.in/index.php?option=com_content&amp;view=article&amp;id=28&amp;Itemid=228">http://cub.ac.in/index.php?option=com_content&amp;view=article&amp;id=28&amp;Itemid=228</a>
377	Library, Aditya Engineering College, Surampalem, Peddapuram, East Godavari District, ANDHRA PRADESH -	NA
378	Osianama Library of Art & Culture, G-2B, Nariman Bhavan, Nariman Point, Mumbai, MAHARASHTRA - 400 021	NA



379	Central Library (Patna Campus), Central University of Bihar, BIT Campus, P.O.- B. V. College, Patna, BIHAR - 800 014	<a href="http://cub.ac.in/index.php?option=com_content&amp;view=article&amp;id=28&amp;Itemid=228">http://cub.ac.in/index.php?option=com_content&amp;view=article&amp;id=28&amp;Itemid=228</a>
380	Library & Information Centre, Cambridge Institute of Technology, Krishnarajapura, Bengaluru, KARNATAKA - 560036	<a href="http://citech.edu.in/library/">http://citech.edu.in/library/</a>
381	Library and Information Centre, Amrita Vishwa Vidyapeetham-University, Bangalore Campus, Kasavanahalli, Off- Sarjapura Road, Carmelaram Post, Bengaluru, KARNATAKA - 560 035	<a href="https://www.amrita.edu/campus/bengaluru/resource/library">https://www.amrita.edu/campus/bengaluru/resource/library</a>
382	Learning Resource Centre, Silvassa College, Dadra and Nagar Haveli Ucchha Shikshya Samiti, Silvassa, Naroli, GUJARAT-396 235	NA
383	Central Library, Vasireddy Venkatadri Institute of Technology (VVIT), Nambur, Pedakakani, Guntur, ANDHRA PRADESH - 522508	<a href="http://www.vvitguntur.com/library.php">http://www.vvitguntur.com/library.php</a>
384	Maharaja Jiwajirao Library(Central Library), Vikram University, Ujjain, MADHYA PRADESH - 456010	<a href="http://www.vikramuniv.net/Library.html">http://www.vikramuniv.net/Library.html</a>
385	Central Library, Sri Krishna Arts and Science College, ugunapuram, Kuniamuthur P.O.,Coimbatore, TAMIL NADU -641 008	<a href="http://www.skasc.ac.in/index.php/library">http://www.skasc.ac.in/index.php/library</a>
386	Library, Mohanlal Sukhadia University (MLSU), Udaipur, RAJASTHAN - 313001	<a href="http://www.mlsu.ac.in/category.php?catid=16&amp;pageid=346&amp;page=Library">http://www.mlsu.ac.in/category.php?catid=16&amp;pageid=346&amp;page=Library</a>
387	Library, Neotech Institute of Technology Vadodara, At Virod, Harni-Virod Road, Vadodara, GUJARAT -390 022	<a href="http://www.neotech.ac.in/infrastructure.aspx?pg=in#1">http://www.neotech.ac.in/infrastructure.aspx?pg=in#1</a>
388	Dr. B.R. Ambedkar Memorial Library, Acharya Nagarjuna Univeristy, Nagrjunanagar, ANDHRA PRADESH -522 510	<a href="http://anu.ac.in/library.php">http://anu.ac.in/library.php</a>
389	Library, International Institute of Information Technology(I2IT), Hinjewadi Rajiv Gandhi Infotech Park, Hinjawadi, Pune, MAHARASHTRA - 411057	<a href="http://www.isquareit.edu.in/index.php?option=com_content&amp;view=category&amp;id=53&amp;Itemid=143">http://www.isquareit.edu.in/index.php?option=com_content&amp;view=category&amp;id=53&amp;Itemid=143</a>
390	Library, Peet Memorial Training College, P.B.No.10,Mavelikara, Alleppy, KERALA - 690 101	NA

391	Library, Allana Institute of Management Sciences (AIMS), 2390 / B - K. B. Hidayatullah Road, New Modikhana, Azam Campus, Camp, Pune, MAHARASHTRA – 411 001	<a href="http://aimspune.org/library.htm">http://aimspune.org/library.htm</a>
392	Library & Documentation Division (Knowledge Resource Center), National Environmental Engineering Research Institute (CSIR-NEERI), Nehru Marg, Nagpur, MAHARASHTRA – 440020	<a href="http://www.neeri.res.in/nlw/index.htm">http://www.neeri.res.in/nlw/index.htm</a>
393	Nava Nalanda Central Library, Thapar University, P.O. Box 32, Bhadson Road, Patiala, PUNJAB – 147004	<a href="http://cl.thapar.edu/">http://cl.thapar.edu/</a>
394	Fatima Matha National College Library (FMNC Library), Fatima Matha National College, P.B. No. 511, Kollam, KERALA– 691001	<a href="http://fmnclibrary.wordpress.com">http://fmnclibrary.wordpress.com</a>
395	University Information Resources Centre (UIRC), (Library), Guru Gobind Singh Indraprastha University, Dwarka, Sector 16-C, NEW DELHI – 110078	<a href="http://www.ipu.ac.in/urc/digital.htm">www.ipu.ac.in/urc/digital.htm</a>
396	Library, Loyola College, Vettavalam, Tiruvannamalai District, TAMIL NADU - 606 754	<a href="http://lcv.edu.in/Library.aspx">http://lcv.edu.in/Library.aspx</a>
397	Central Library (Knowledge Center), RK University, Bhavnagar Highway, Kasturbadham, Rajkot, GUJARAT – 360020	<a href="http://27.54.180.75/opac">http://27.54.180.75/opac</a>
398	Library, Educational Multimedia Research Centre (EMMRC), Anna University, Chennai, TAMIL NADU – 600025	NA
399	University Library, Osmania University, Main Rd, Hyderabad, TELANGANA– 500007	<a href="http://www.osmania.ac.in">www.osmania.ac.in</a>
400	Knowledge Resource Centre, Defence Scientific Information and Documentation Centre (DESIDOC), Metcalfe House, NEW DELHI– 110054	<a href="http://www.drdo.gov.in/drdo/labs/DESIDOC/English/index.jsp?pg=homebody.jsp">http://www.drdo.gov.in/drdo/labs/DESIDOC/English/index.jsp?pg=homebody.jsp</a>
401	Library, Community Institute of Management Studies, 9th Main, 9th Cross, 2nd Block, Jayanagar, Opp BBMP Office, Bengaluru, KARNATAKA -560011	<a href="http://www.cimsbschool.org/page.php?page_name=facilities">http://www.cimsbschool.org/page.php?page_name=facilities</a>

402	Central Library, Baba Ghulam Shah Badshah (BGSB) University, Rajouri, JAMMU & KASHMIR- 185131	<a href="http://www.bgsbuniversity.org/central_library.htm">http://www.bgsbuniversity.org/central_library.htm</a>
403	Library, College of Horticulture (Kolar), University of Horticultural Sciences, Sector - 60, Navanagar, Bagalkot, KARNATAKA – 587102	<a href="http://uhsbagalkot.edu.in/Home/Library">http://uhsbagalkot.edu.in/Home/Library</a>
404	J.N.Medical College Library (Jawaharlal Nehru Medical College Library), AMU Campus, Aligarh, UTTAR PRADESH – 202002	<a href="http://www.amu.ac.in/jnmclib.jsp?did=10068">http://www.amu.ac.in/jnmclib.jsp?did=10068</a>
405	Library, Management Development Institute (MDI), Mehrauli Road, Sukhrali, Gurgaon, HARYANA – 122 001	<a href="http://mdi.ac.in/infrastructure/library.html">http://mdi.ac.in/infrastructure/library.html</a>
406	Knowledge Center & Information Services, JK Business School, Gurgaon-Sohna Expressway, Damdama Lake Road Bhondsi, Gurgaon, HARYANA – 122102	<a href="http://jkbschool.org/knowledge-center-and-information-services.html">http://jkbschool.org/knowledge-center-and-information-services.html</a>
407	Library, Administrative Staff College of India (ASCI), Bella Vista, Raj Bhavan Road, Khairatabad, Hyderabad, TELANGANA - 500 082	<a href="http://www.asci.org.in/Information.aspx">http://www.asci.org.in/Information.aspx</a>
408	Central Library, Sree Chaitanya Institute of Technological Sciences, L.M.D Colony, Thimapoor, Karimnagar, TELANGANA – 505001	<a href="http://scit.ac.in/Librarywebsite/index.html">http://scit.ac.in/Librarywebsite/index.html</a>
409	Library, Khandesh College Education Society's Moolji Jaitha College (M.J.College), Ramanand Nagar, Jalgaon, MAHARASHTRA – 425001	<a href="http://mjcollege.kces.in/Library/Default.aspx">http://mjcollege.kces.in/Library/Default.aspx</a>
410	L.N.B.Library (Lakshminath Bezbaroa Library) Dibrugarh University, Dibrugarh, ASSAM – 786004	<a href="http://www.dibru.ac.in/library">www.dibru.ac.in/library</a>
411	Central Library, CMR College of Engineering, Kandlakoya (V), Medchal Road, Hyderabad, ANDHRA PRADESH -501 401	<a href="http://www.cmrgroup.org/library.html">http://www.cmrgroup.org/library.html</a>
412	Library, Ministry of Earth Sciences, Government of India, Prithvi Bhavan, Opp. India Habitat Centre, Lodhi Road, NEW DELHI – 110003	<a href="http://librarymoes.nic.in/welcome.asp">http://librarymoes.nic.in/welcome.asp</a>
413	University Library, Goa University, Taleigao Plateau, GOA -403 206	<a href="http://library.unigoa.ac.in/">http://library.unigoa.ac.in/</a>
414	Kilachand Library, The Doon School, Mall Road, Dehradun, UTTARAKHAND -248001	<a href="http://www.doonschool.com/the-school-and-">http://www.doonschool.com/the-school-and-</a>

		<a href="#">campus/facilities/library</a>
415	Technical Information Resource Centre (TIRC), Armament Research & Development Establishment (ARDE), Pune, MAHARASHTRA – 411021	<a href="http://drdo.gov.in/drdo/labs/ARDE/English/index.jsp?pg=facility.jsp">http://drdo.gov.in/drdo/labs/ARDE/English/index.jsp?pg=facility.jsp</a>
416	Library & Information Centre (LIC), Central Council for Research in Unani Medicine, 61-65, Institutional Area, Opp. D-Block, Janakpuri, NEW DELHI –110 058	<a href="http://www.ccrum.net/library/about-lic/">http://www.ccrum.net/library/about-lic/</a>
417	Library, The Janardan Bhagat Shikshan Prasarak Sanstha's (JBSPS-B.S.P. Sanstha's Changu Kana Thakur ACS College)Changu Kana Thakur Arts, Commerce and Science College, Plot No.-01, Sector-11, Khanda Colony,New Panvel (W), Raigad District, MAHARASHTRA -	<a href="http://www.ckthakurcollege.net/index.php?body_page=content.php&amp;&amp;enc_cid=d96409bf894217686ba124d7356686c9#">http://www.ckthakurcollege.net/index.php?body_page=content.php&amp;&amp;enc_cid=d96409bf894217686ba124d7356686c9#</a>
418	Central Library, Vishwakarma Institute Of Information Technology (VIIT), Survey No. 2/3/4, Kondhwa (Budruk), Pune, MAHARASHTRA – 411048	<a href="http://www.viit.ac.in/central-library.html">http://www.viit.ac.in/central-library.html</a>
419	Library, Govt. Post Graduate College, I-1, Sector-39, Noida, UTTAR PRADESH – 201303	<a href="http://www.gpgcnoida.org/Library.aspx">http://www.gpgcnoida.org/Library.aspx</a>
420	Library, Gopal Chandra Memorial (G.C.M) College Of Education, BT College Rd, Chittaranjan Para, New Barrakpur, Kolkata, WEST BENGAL – 700133	NA
421	Library, R.G.Sapkal College of Pharmacy, 'Kalyani Hills', Anjaneri-Wadholi, Trimbakeshwar Road, Nashik, MAHARASHTRA –422213	<a href="http://www.sapkalknowledgehub.org/rgscop/library.php">http://www.sapkalknowledgehub.org/rgscop/library.php</a>
422	University Branch Library, Juhu campus - Mumbai, SNDT Women's University Branch library, Thackersey Vidya Vihar, Juhu Road, Santacruz (W),Mumbai, MAHARASHTRA -400 049	NA
423	Library, S.R.T.M. University Nanded, Sub-Centre, Latur, Post Box No- 131, Ausa Road, Peth, Latur, MAHARASHTRA – 413531	<a href="http://srtmun.ac.in/Subcentre/Library.aspx">http://srtmun.ac.in/Subcentre/Library.aspx</a>

424	Library, PES Law College, NM Kale Marg, Gokhale Road, Purandare Wadi, Dadar West, Mumbai, MAHARASHTRA – 400028	<a href="http://www.peslawcollege.com/index.php/admissions">http://www.peslawcollege.com/index.php/admissions</a>
425	Central Library, K. J. Somaiya College of Engineering (KJSCE), Vidyanagar, Vidyavihar(E), Mumbai, MAHARASHTRA – 400077	<a href="https://www.somaiya.edu/kjsce/academics/library">https://www.somaiya.edu/kjsce/academics/library</a>
426	Library, Guru Nanak College of Education and Research, Shivaji Talav, Tank Road, Bhandup (W), Mumbai, MAHARASHTRA – 400078	<a href="http://www.gncer.org/?Facilities/Library">http://www.gncer.org/?Facilities/Library</a>
427	Library and Documentation Unit, Karmveer Vidhyapeeth Makhanlal Chaturvedi Rahtriya Patrakarita National University of Journalism, B-38 Vikas Bhawan, Opp Dak Bhawan, Press Complex, Zone-1 M.P. Nagar, Bhopal, MADHYA PRADESH – 462011	NA
428	Central Library, Paavai College of Engineering, Paavai Institutions, Paavai Nagar, NH-7, Pachal, Namakkal, TAMIL NADU -637 018	<a href="http://pce.paavai.edu.in/facilities/Library.aspx">http://pce.paavai.edu.in/facilities/Library.aspx</a>
429	Library, EPW Research Foundation (EPWRF), C-212, Akurli Industrial Estate, Akurli Road, Kandivli (East), Mumbai, MAHARASHTRA -400 101	NA
430	Library, Podar International School (IB & CIE) – Secondary Section, Ramee Emerald Building, Near Shamrao Vitthal Bank, S. V. Road, Khar (West), Mumbai, MAHARASHTRA– 400052	<a href="http://www.podarinternationalschool.com/facilitybox_library.html">http://www.podarinternationalschool.com/facilitybox_library.html</a>
431	Learning Resource Center(LRC), (LRC of We School), Prin.L.N. Welingkar Institute of Management Development & Research, L.Napoo Road, Matunga (Central), Mumbai, MAHARASHTRA -400 019	<a href="https://elearn.welingkar.org/infowe/">https://elearn.welingkar.org/infowe/</a>
432	Library, MATS Law School, Mats University, Raipur, CHHATTISGARH -	NA
433	Library Resource Center, NCRD'S Sterling Institute Of Pharmacy, Plot No. 93, Sector - 19, Nerul(E), Opposite to Seawood Rly.Station, Navi Mumbai, MAHARASHTRA – 400706	<a href="http://www.ncrdsip.com/infrastructure.html">http://www.ncrdsip.com/infrastructure.html</a>
434	University Library, Tumkur University,	<a href="http://tumkuruniversity.ac.in/index">http://tumkuruniversity.ac.in/index</a>

	Vishwavidyanilaya Karyalaya, B.H Road, Tumkur, KARNATAKA – 572103	<a href="http://www.vishwavidyanilaya.org/php/university-library/">http://www.vishwavidyanilaya.org/php/university-library/</a>
435	Computer Library, Khandesh College Education Society's (KCES's) Institute of Management & Research, IMR Campus, Behind DIC, NH - 06, Jalgaon, MAHARASHTRA – 425001	<a href="http://www.imr.ac.in/02_campus/library.aspx">http://www.imr.ac.in/02_campus/library.aspx</a>
436	Central Library, Indian Institute of Technology Ropar, (IIT Ropar) Nangal Road, Rupnagar, PUNJAB – 140001	<a href="http://iitrpr.ac.in/library">http://iitrpr.ac.in/library</a>
437	Library, Archaeological Survey of India (ASI), Bangalore Circle, 5th Floor, F Wing, Kendriya Sadan, 17th Main Road, Koramangala, Bengaluru, KARNATAKA – 560034	NA
438	Central Library, Government Polytechnic Mumbai, 49, Kherwadi, A.Y. Jung Marg, Bandra (East), Mumbai, MAHARASHTRA – 400051	<a href="http://www.gpmumbai.ac.in/CentralLibrary.aspx">http://www.gpmumbai.ac.in/CentralLibrary.aspx</a>
439	Central Library, Bharati Vidyapeeth Deemed University (BVDU), Medical College and Hospital, SangliSangli- Miraj Road, Sangli, MAHARASHTRA – 416416	<a href="http://mchsangli.bharativedyapeeth.edu/Infrastructure/Library/default.aspx">http://mchsangli.bharativedyapeeth.edu/Infrastructure/Library/default.aspx</a>
440	Library, Kamla Nehru Mahavidyalaya, Kamla Nagar, Kotra Sultanabad, Bhopal, MADHYA PRADESH – 462003	<a href="http://kamlanehru-college.org/info.php?show=13">http://kamlanehru-college.org/info.php?show=13</a>
441	Library, National Institute of Bank Management Pune (NIBM, Pune), NIBM Post Office, Kondhwa Khurd, Pune, MAHARASHTRA -411 048	<a href="http://www.nibmindia.org/library.php">http://www.nibmindia.org/library.php</a>
442	Library, JSS College of Arts Commerce and Science, Ooty Road, Chamundipuram, Mysuru, KARNATAKA – 570025	<a href="http://www.jsscacs.edu.in/library">http://www.jsscacs.edu.in/library</a>
443	Library, Dr. Harvansh Singh Judge Institute of Dental Sciences & Hospital (Dr.HSJIDS), South UIET, Panjab University, Sector 25, CHANDIGARH -160014	NA
444	Library, Shankar Narayan College of Arts and Commerce, Mahavydyalaya Marg, Navghar Gaon, Bhayandar (E) Thane, MAHARASHTRA– 401105	<a href="http://sncollege.com/library.html">http://sncollege.com/library.html</a>

445	Library, Dr.Ambedkar College of Education, Pipeline Road, J.C.Nagar, Mahalakshmpuram Post, West of Chord Road, Bengaluru, KARNATAKA - 560 086	<a href="http://www.dracebangalore.org.in/index.php?option=com_content&amp;view=article&amp;id=49&amp;Itemid=57">http://www.dracebangalore.org.in/index.php?option=com_content&amp;view=article&amp;id=49&amp;Itemid=57</a>
446	Central Library, Genba Sopanrao Moze College of Engineering (GSMCOE),25/1/3, Balewadi, Haveli, Pune, MAHARASHTRA - 411 045	<a href="http://gsmozecoe.org/infrastructure.php">http://gsmozecoe.org/infrastructure.php</a>
447	Learning Resource Centre (LRC), Indian Institute of Management Tiruchirappalli (IIM Trichy), NIT Campus (Post), Thanjavore Main Road, Thuvakudi, Tiruchirappalli, TAMIL NADU - 620 015	<a href="http://library.iimtrichy.ac.in/">http://library.iimtrichy.ac.in/</a>
448	Knowledge and Information Center, National Institute of Technology (NIT) Sikkim, Barfung Block Ravangla Sub-Division South, SIKKIM - 737 139	<a href="http://www.nitsikkim.ac.in/campuslife/library.php">http://www.nitsikkim.ac.in/campuslife/library.php</a>
449	Library, S.N. Bose National Centre for Basic Sciences (SNB Library), JD Block, Sector-III, Salt Lake City, Kolkata, WEST BENGAL- 700 098	<a href="http://bose.res.in/~library/">http://bose.res.in/~library/</a>
450	Library, Vellore Institute of Technology (VIT) University, Chennai Campus, Vandalur - Kelambakkam Road, Chennai, TAMIL NADU - 600 127	<a href="http://chennai.vit.ac.in/exceptional-library">http://chennai.vit.ac.in/exceptional-library</a>
451	Information Centre, The Printers(Mysore)Private Ltd., M.G Road, Bengaluru, KARNATAKA - 560001	NA
452	Dr. O.P. Bhalla Central Library, Manav Rachna International University (MRIU), Aravalli Campus, Sector - 43, Delhi - Surajkund Road, Faridabad, HARYANA - 121004	<a href="http://central-library.mriu.edu.in/">http://central-library.mriu.edu.in/</a>
453	Library, Model College,P-32, MIDC, Residential Area, Dombivli (East) , Mumbai, MAHARASHTRA - 421 203	<a href="http://www.mcdlibrary.bugs3.com/">http://www.mcdlibrary.bugs3.com/</a>
454	Library, Sai Nath Group of Education, Opposite kamayani hospital,Sikandra, Agra, UTTAR PRADESH - 282007	NA
455	Library, V.K. Krishna Menon College of Commerce, & Economics & Science, Opp.	NA

	Bhandup Railway Station, Vir Savarkar Marg, Bhandup mumbai, MAHARASHTRA – 400042	
456	Central Library, MANJARA Charitable Trust's Rajiv Gandhi Institute of Technology, Juhu Versova Link Road, Behind HDFC Bank Versova, Andheri(West), Mumbai, MAHARASHTRA - 400 053	<a href="http://www.mctrigit.ac.in/library.php">http://www.mctrigit.ac.in/library.php</a>
457	Library, Central Institute of Medical Sciences (CIIMS), Bajaj Nagar, Nagpur, MAHARASHTRA – 440010	NA
458	Library, Nashik District Maratha Vidya Prasarak Samaj's, Karmaveer Adv. Baburao Ganpatrao Thakare College of Engineering, Nashik, MAHARASHTRA -13	NA
459	Library, Singad College of Arts, Science & Commerce, (SCOASC Library), 19/15, Smt Khilare Marg, Off Karve Road, Erandwane, Pune. MAHARASHTRA – 411004	NA
460	Asmita College Library, Kannamwar Nagar 2, Vikhroli (E), Mumbai, MAHARASHTRA - 83	<a href="http://www.asmitacollege.org/campus-lib.html">http://www.asmitacollege.org/campus-lib.html</a>
461	Library, E-Books Digital , Multimedia Library, Pune, MAHARASHTRA	NA
462	Library, Government First Grade College (GFGC) , Huliya Raod, Bukkapatna, Sira, Tumkur District, KARNATAKA – 572115	<a href="http://www.gfgcbukkipatna.org/lib.php">http://www.gfgcbukkipatna.org/lib.php</a>
463	Library, St. Joseph's College of Engineering and Technology (SJCT), Palai, Choondacherry P.O, Palai, Kottayam, KERALA -686 579	<a href="http://www.sjcetpalai.ac.in/college-library/">http://www.sjcetpalai.ac.in/college-library/</a>
464	Central Library, Nagaland University, Lumami, Zunheboto District, NAGALAND - 798 627	<a href="http://nagauniv.org.in/index.php/facilities/libraries/library-lumami">http://nagauniv.org.in/index.php/facilities/libraries/library-lumami</a>
465	KES Shroff College Library, Mumbai, MAHARASHTRA	<a href="http://www.kesshroffcollege.com/library.html">http://www.kesshroffcollege.com/library.html</a>
466	Allama Iqbal Library, The University of Kashmir, Hazratbal, Srinagar, JAMMU & KASHMIR - 190006	<a href="http://ail.uok.edu.in/">http://ail.uok.edu.in/</a>
467	Library, St Ann's P G College For Women, Annapurna Colony, Mallapur, Mallapur, Hyderabad, ANDHRA PRADESH – 500076	NA



468	Library, Sapthagiri College of Engineering Library, #14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru, KARNATAKA - 560057	<a href="http://www.sapthagiri.edu.in/facilities/library/">http://www.sapthagiri.edu.in/facilities/library/</a>
469	Library, Kendriya Vidyalaya Umroi Cantt. (KVUC Library), K. V. Umroi Cantt., P. O. Barapai, Distt. Ri-Bhoi, Shillong, MEGHALAYA – 793103	<a href="http://www.kvuclibrary.wordpress.com">www.kvuclibrary.wordpress.com</a>
470	Library, Rajapalayam Rajus' College (RRC Library), Mudangiar Road, Rajapalayam TAMIL NADU - 626 117	<a href="http://rrc1973.org.in/">http://rrc1973.org.in/</a>
471	Knowledge Resource Centre, National Institute for Interdisciplinary Science and Technology (NIIST), Industrial Estate Po, Epabx, M G Road, M G Road, Thiruvananthapuram, KERALA - 695001	<a href="http://www.niist.res.in/english/research-areas/knowledge-research-center/about-krc.html">http://www.niist.res.in/english/research-areas/knowledge-research-center/about-krc.html</a>
472	Library, Sri Guru Gobind Singh College of Commerce (SGGSCC), Netaji Subhash Palace, Guru Govind Singh College, Pitampura, New Delhi, NEW DELHI- 110034	<a href="http://www.sggsc.ac.in/Facilities.jsp#Library">http://www.sggsc.ac.in/Facilities.jsp#Library</a>
473	Central Library, Mangalayatan University, Extended NCR, 33rd Milestone, Mathura-Aligarh Highway, Beswan Aligarh-202145	<a href="http://www.mangalayatan.in/life-at-mu/library">http://www.mangalayatan.in/life-at-mu/library</a>
474	D J Resource Center, D J Academy of Design, Coimbatore – Pollachi Highway, Othakkalmandapam Post, Coimbatore, TAMIL NADU – 641 032	<a href="http://www.djad.in/campus/academic-resources/">http://www.djad.in/campus/academic-resources/</a>
475	Library, The Institute of Chartered Accountants of India, ICAI Bhawan, 122, Mahatma Gandhi Road, Post Box No. 3314, Numgambakkam, Chennai, TAMIL NADU -600 034	NA
476	Library, Centre for the Study of Social Exclusion and Inclusive Policy (CSSEIP), University of Rajasthan, JLN Marg, Jaipur, RAJASTHAN – 302004	NA
477	Library, National Institute of Immunohaematology (NIIH), Indian Council of Medical Research (ICMR), 13th Floor, New Multistoreyed Building, KEM HOSP. Campus, Parel, Mumbai, MAHARASHTRA – 400012	<a href="http://www.niih.org.in/infrastructure/library/library.htm">www.niih.org.in/infrastructure/library/library.htm</a>

478	Central Library, University of Kota, Swami Vivekananda Nagar, Kota, RAJASTHAN – 324010	<a href="http://uok.ac.in/library_website/home.html">http://uok.ac.in/library_website/home.html</a>
479	Mukeshbhai Patel Central Library, SVKM's NMIMS ( Deemed to be University) V.L.Mehta Road, Vile Parle (W), Mumbai, MAHARASHTRA – 400056	<a href="http://www.nmims.edu/about/">http://www.nmims.edu/about/</a>
480	Library, Capgemini (Consulting, Technology, and Outsourcing Services), 1, ISB Rd, Financial District, Gachibowli, Hyderabad, TELANGANA – 500032	NA
481	Central Library, Pushpagiri Institute of Medical Sciences & Research Centre (PIMSRC), Tiruvalla, KERALA - 689 101	NA
482	Central Library, Parvatibai Genba Moze College of Engineering (PGMCOE), Gate No. 2181, Pune Nagar Highway, Wagholi, Pune, MAHARASHTRA – 412207	<a href="https://sites.google.com/site/pgmcoelibrary/">https://sites.google.com/site/pgmcoelibrary/</a>
483	Central Library, International Institute of Information Technology (IIIT-H), Gachibowli, Hyderabad, TELANGANA - 500 032	NA
484	Library, Bombay Natural History Society, Hornbill House, Opp.Lion Gate, Shaheed Bhagat Singh Road, Mumbai, MAHARASHTRA - 400 001	<a href="http://bnhs.org/bnhs/library">http://bnhs.org/bnhs/library</a>
485	Institute of Management Studies' Learning Resource Centre, Station Road, Ahmednagar, MAHARASHTRA – 414001	<a href="http://library.imscdr.in/">http://library.imscdr.in/</a>
486	Library, SelaQui International School (SIS), Chakrata Road, Dehradun, UTTARAKHAND - 248 197	NA
487	Central Library, SVS College of Engineering, J P Nagar, Arasampalayam, Myleripalayam, Coimbatore, TAMIL NADU	<a href="http://svslibrary.pbworks.com/">http://svslibrary.pbworks.com/</a>
488	Library and Information Centre, D.S.B.G.Government First Grade College, Mudigere, Chikamangalur, KARNATAKA – 577132	NA

489	Central Library, Sri Venkateswara University, Tirupati, ANDHRA PRADESH - 517 502	<a href="http://lib.svuniversity.ac.in/">http://lib.svuniversity.ac.in/</a>
490	Library, SNT Global Academy of Management Studies and Technology (SNTGAMSAT), Near L&T Bye Pass Junction on NH 47, Chettipalayam Pirivu, Marapalam, Madukkarai, Coimbatore, TAMIL NADU – 641105	<a href="http://sntgamsat.in/facility.html">http://sntgamsat.in/facility.html</a>
491	Central Library, National Institute of Technology Karnataka, Surathkal, Mangalore, KARNATAKA - 575 025	<a href="http://library.nitk.ac.in">http://library.nitk.ac.in</a>
492	Central Library, Padre Conceicao College of Engineering (PCCE), Opposite Agnel Ashram, Next to Hotel Leonaras, Verna, Goa, MAHARASHTRA – 403722	<a href="http://www.pccegoa.org/Library/index.html">http://www.pccegoa.org/Library/index.html</a>
493	Knowledge Resource Centre (KRC), Abdul Razzak Kalsekar Polytechnic (ARKP), Plot # 2 & 3, Near Thana Naka, Khanda Gaon, New Panvel, Navi Mumbai, MAHARASHTRA – 410206	<a href="http://www.arkp.org/library.aspx">http://www.arkp.org/library.aspx</a>
494	Central Library, Rajiv Gandhi University of Knowledge Technologies, IIIT-H Campus, Gachibowli, Hyderabad, TELANGANA– 500032	<a href="http://www.rgukt.in/library-index.html">http://www.rgukt.in/library-index.html</a>
495	Library, Maharshi Dayanand College, Maharshi Dayanand College of Arts, Sc. & Commerce, Parel, Mumbai, MAHARASHTRA -12	<a href="http://www.mdcollegelibrary.in">www.mdcollegelibrary.in</a>
496	PIBM Library, Pune Institute of Business Management, S. No. 499, Paud Road, Bhugaon, Near Manas Resort,, Pune, MAHARASHTRA – 412115	NA
497	Library and Information Services, Space Applications Centre (SAC), Indian Space Research Organization (ISRO), Jodhpur Village, Ahmedabad, GUJARAT – 380015	<a href="http://www.sac.gov.in/SACSITE/asac-anoverview.html">http://www.sac.gov.in/SACSITE/asac-anoverview.html</a>
498	Library, Jyoti Nivas College Autonomous, Hosur Road, Bengaluru, KARNATAKA– 560095	<a href="http://www.jyotinivas.org/cam_Library.html">http://www.jyotinivas.org/cam_Library.html</a>
499	Library, USM-KLE International Medical Programme (USM-KLE IMP), District Stadium Road, Nehru Nagar, Belgaum, KARNATAKA - 590010	<a href="http://www.usmkle.edu.in/library.html">http://www.usmkle.edu.in/library.html</a>

500	Central Library, Central University of Karnataka, Kadaganchi, Aland Road, Kalaburgi, KARNATAKA - 585 311	<a href="http://cuklibrary.ac.in">cuklibrary.ac.in</a>
501	College Library, PES Institute of Technology and Management, NH 206, Sagar Road, Shivamogga, KARNATAKA – 577 204	<a href="http://pestrust.edu.in/pesitm/library/">http://pestrust.edu.in/pesitm/library/</a>
502	Library, Parikrama College of Engineering, Hon. Shree. Babanrao Pachpute Vichardhara Trust's Group of Institutes, Kashti, Shrigonda, Ahmednagar, MAHARASHTRA	NA
503	Raksha Shakti University Library, Raksha Shakti University, New Mental Corner, Meghaninagar, Ahmedabad, GUJARAT -	<a href="http://rakshashaktiuniversity.edu.in/facilities/library.aspx">http://rakshashaktiuniversity.edu.in/facilities/library.aspx</a>
504	Central Library, Royal Group of Institutions, National Highway 37 Road, Opposite Tirupati Balaji Temple/ISBT, Betkuchi, AHOM GAON, Guwahati, ASSAM – 781035	NA
505	Bhogawati Mahavidyalaya Library, Kurukali kolhapur, MAHARASHTRA	<a href="http://www.bhogawaticollege.com/cms1.php?page_id=25">http://www.bhogawaticollege.com/cms1.php?page_id=25</a>
506	Central Library, Dev Sanskrit Vishwavidyalaya, Gayatri kunj-Shantikunj, Haridwar, UTTARAKHAND – 249411	<a href="http://www.dsvv.ac.in/central-library/">http://www.dsvv.ac.in/central-library/</a>
507	Central Library, Jadavpur University, 188, Raja S.C. Mallick Rd, Kolkata, WEST BENGAL – 700032	<a href="http://www.jaduniv.edu.in/htdocs/newindex.htm#">http://www.jaduniv.edu.in/htdocs/newindex.htm#</a>
508	Library, National Institute of Virology, 20-a, Dr Babasaheb Ambedkar Road, Pune, MAHARASHTRA – 411001	NA
509	Diwan G. J. Advani Law Library, Gopaldas Jhamatmal Advani Law College (GJALC), 32nd Road, Linking Road, National College Campus, Bandra (W), Mumbai, MAHARASHTRA - 400 050	<a href="http://www.advanilaw.in/Library.htm">http://www.advanilaw.in/Library.htm</a>
510	Library, Bharathiya Vidhya Bhavan Vidhyashram (BVBV), K M Munshi Marg, Opposite Ots, Jaipur, RAJASTHAN – 302015	<a href="https://apitara.wordpress.com/library-2/">https://apitara.wordpress.com/library-2/</a>
511	Library, Govt Degree College, Gabhana, Aligarh, UTTAR PRADESH -	NA

512	Cetral library, PDM College of Engineering, Sector-3A, Sarai Aurangabad , Bahadurgarh, HARYANA – 124507	<a href="http://www.pdmce.ac.in/lib/">http://www.pdmce.ac.in/lib/</a>
513	Library, The Indian Law Institute (ILI), Opp. Supreme Court of India, Bhagwan Das Road, NEW DELHI – 110001	<a href="http://ili.ac.in/library.htm">http://ili.ac.in/library.htm</a>
514	Library, Indian Institute of Information Technology, Design & Manufacturing (IIITD&M) Kancheepuram, Melakottaiyur Village, Off Vandalur-Kelambakkam Road, Nellikuppam Road, Chennai, TAMIL NADU - 600 127	<a href="http://www.iiitdm.ac.in/Library.html">http://www.iiitdm.ac.in/Library.html</a>
515	The Shantarakshita Library, Central University of Tibetan Studies, Sarnath, Varanasi, UTTAR PRADESH – 221007	<a href="http://www.cuts.ac.in/GuestSection/overview.html#">http://www.cuts.ac.in/GuestSection/overview.html#</a>
516	H. K. Commerce College, Nehru Bridge Near Kamal Restaurant Nr. Chinubhai Tower Nehru Bridge Ahmedabad, GUJARAT - 380 009	NA
517	A.J. Institute of Medical Sciences & Research Centre, Kuntikana, NH -66, Mangalore, KARNATAKA - 575 004	NA
518	Central Library, B.V. Bhoomaraddi College of Engineering & Technology, Vidyanagar, Hubli, KARNATAKA – 580031	NA
519	Central Library, Dr L H Hiranandani Hospital, Hill Side Avenue, Hiranandani Gardens, Powai, Mumbai, MAHARASHTRA- 400 076	NA
520	Dr Zakir Husain Library(Central Library), Jamia Millia Islamia, Jamia Nagar, NEW DELHI – 110025	<a href="http://jmi.ac.in/zhlibrary">http://jmi.ac.in/zhlibrary</a>

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