DESIDOC Journal of Library & Information Technology, Vol. 35, No. 1, January 2015, pp. 30-40 DOI: 10.14429/djlit.35.1.7897

Adoption of Open Source Software in India

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ABSTRACT

The present paper is based on the survey conducted to assess the status of application of open source software (OSS) in India. The analysis of the study revealed that 91 institutions in India using OSS for library management and OPAC of these institutions are accessible in public domain. There are 96 open access repositories created by using OSS which are accessible in public domain. The study also discloses that 8 institutions in India have two open access digital repositories each which are created by OSS and 14 institutions are using OSS for library automation as well as for digital library.

Keywords: Open source software, institutional repository, library automation, digital library

1. INTRODUCTION

Open source software (OSS) is gaining popularity in the library profession nowadays and emerged as an alternative model of and revolutionised the software development. In the last decade, several attempts were made to develop software for libraries on open source platform and as a result, many open source library automation software, open source digital library software and other useful OSS for libraries drawing the attention of librarians. Avanti Library Systems grew out of a project started in 1998 by Peter Schlumpf to develop a simple low cost open source library system for small libraries. The Evergreen Project was initiated by the Georgia Public Library System in 2006. Greenstone software was originally released in 2000. E-print was developed at the University of Southampton, UK and its first version was released in 2000. The first version of DSpace was released in November 2002. KOHA that was originally developed by Katipo Communications Limited, New Zealand for the Horowhenua Library Trust in 1999 was released as free software under General Public License in 2000. On 9 January 2008, New GenLib was declared Open Source Software under GNU GPL License by Verus Solutions. VuFind was developed and maintained at Villanova University's Falvey Memorial Library and released in 2007. Open Journal Systems (OJS) is an online journal management and publishing platform that was first launched in 2002 as OSS.

The term OSS can be confusing at times. Typically, people associate OSS with software that you can download and install for free. This definition focuses solely on the cost aspect. However, some OSS can be downloaded and installed for free, cost really is not what OSS is about. As its core, OSS is about the freedom to adopt and customise software[1].

Open source software can be defined as computer software for which the human-readable source code is made available under a copyright license that meets the open source definition. This permits users to use, change, and improve the software, and to distribute it in modified or unmodified form. It is very often developed in a public, collaborative manner.

1.1 Open Source Software for Libraries

1.1.1 KOHA

KOHA is the first open-source integrated library system (ILS) that was originally developed by katipo communications limited, New Zealand for the Horowhenua Library Trust in 1999. KOHA was released as free software under general public license in 2000. It supports all modules of library applications as well as has support for Z39.50 server, multilingual support, supports library standards such as MARC-21/UNIMARC, OAI-PMH, ISO-2709 and also supports several next generation OPAC

Received 11 August 2014, Revised 16 Dcember 2014, online published 22 January 2015

features. KOHA community has been providing support through its mailing lists and IRC rooms. Software has detailed online manual and there are several power-point presentations available on various modules of KOHA on internet. Many commercial vendors provide support for KOHA. In India, OSS Labs, Mumbai,; Open LX, Anant Corporation, Mumbai, etc., are the main commercial players who provide support for KOHA. The software can handle millions of records and transactions[2].

1.1.2 NewGenLib

NewGenLib is an integrated library management system developed by Verus Solutions Pvt Ltd. Domain expertise is provided by Kesavan Institute of Information and Knowledge Management in Hyderabad, India. NewGenLib version 1.0 was released in March 2005. The software has been distributed under the traditional commercial license model since 2003. In January 2008, a decision was made to offer the system as OSS under the GNU GPL (General Public License). On 9 January 2008, NewGenLib was declared OSS under GNU GPL Licence by Verus Solutions. Functional modules of NewGenLib are completely web-based. NewGenLib complies with international metadata and interoperability standards: MARC-21, MARC-XML, Z39.50, SRU/W, OAI-PMH.

1.1.3 OpenBiblio

OpenBiblio[3], which is being developed by a small number of people, has been an off and on again project. Development activity peaked in 2006-2007 with the release of its 0.6.0 version. The latest version 0.7.1 has been released on 18 March 2012. This version 0.7.1. is recommended for new installations and for updating older versions of OpenBiblio, including all versions from openbiblio. de. The product includes cataloging, circulation, and patron access catalog modules. The programming languages are PHP and LAMP, and the operating system is Linux. UNIMARC is supported. There is an online demo and software can be downloaded. There is no reliable scalability information for LAMP. Openbilio runs under Linux or Windows, any web server, PHP, and MySQL.

1.1.4 DSpace

DSpace has been designed and developed by Massachusetts Institute of Technology (MIT) libraries and Hewlett-Packard (HP). DSpace was designed as an open source application so that institutions could run with relatively few resources. It is to support the long-term preservation of the digital material stored in the repository. It is also designed to make submission easy. DSpace supports submission, management, and access of digital contents. DSpace can be installed on Linux, Unix and windows. DSpace is freely available under BSD licence. It is a platform that allows users to capture items in any format–in text, video, audio, and data. It indexes work, so users can search and retrieve items. DSpace provides a way to manage research materials and publications in a professionally maintained repository to give them greater visibility and accessibility over time.

1.1.5 E-prints

E-prints was developed at the University of Southampton, UK with the first version of the software publicly released in 2000. As the first professional software platform for building high-quality OAI-compliant repositories, E-prints is already established as the easiest and fastest way to set up repositories of open access research literature, scientific data, theses, reports, and multimedia. E-prints 3 is a major leap forward in functionality, giving even more control and flexibility to repository managers, depositors, researchers and technical administrators. The latest version of E-prints: v3.3.10 is available for Debian/Ubuntu, Redhat/Fedora and Windows. In brief, E-prints requires Apache (with mod_perl), MySQL and Perl with some extra modules.

1.1.6 Greenstone

Greenstone[4] is a suite of software for building and distributing digital library collections. It provides a new way of organising information and publishing it on the internet. Greenstone is produced by the New Zealand Digital Library Project at the University of Waikato, and developed and distributed in cooperation with UNESCO and the Human Info NGO. It is open-source, multilingual software, issued under the terms of the GNU General Public License. The aim of software is to empower users, particularly in universities, libraries, and other public service institutions, to build their own digital libraries. Greenstone was originally released in 2000. Greenstone is mainly programmed in C++ and Perl and runs on all versions of Windows, and Unix/Linux, and Mac OS-X. The complete Greenstone interface and all documentation are available in English, French, Russian and Kazakh. Greenstone also has interface in many other languages.

2. LITERATURE REVIEW

Patra[5], *et al.,* in their paper discussed the management of institutional repository in India using DSpace and presented the status of the digitisation of IR in India. Jose[6] in his survey concluded that DSpace is the most widely used digital library software in India with 13 installations. E-prints and Greenstone are also used in India. However, digital libraries based on Fedora could not be found.

Sheeja[7] identified the extent of adoption of KOHA, an open source ILS in libraries around the world through a web-based study. The study found that only 212 libraries are currently registered themselves in KOHA user group. There may be some more libraries that are using KOHA but not registered themselves in the user group. The study revealed that out of 20 KOHA installations in India, the major groups of libraries belong to Kerala 6 (30 %), Karnataka 3 (15 %), and Tamil Nadu 3 (15 %).

Biswas & Paul[8] identified the extent of adoption of open source digital library software in various Institutions through online survey. They also compared the features of DSpace and Greenstone. In their web survey, it has found that 72 institutions have installation of the repository software in various parts of the world. DSpace with 42 installations seem to be the most popular choice among the digital library software packages and Greenstone has seven installations.

Kumar & Jasimudeen[9] provide a brief picture of KOHA software adoption and the users' perception about it in the Indian library scenario. They found that the software is popular among the southern states of India and the number of KOHA users in India is growing.

Roy[10], *et al*., conducted an analytical study of institutional repositories in India and found that open source digital library packages are gaining popularity nowadays. The different IRs use different types of OSS like DSpace, E-prints, Greenstone, Nitya, etc., Few IRs have not mentioned about type of software used. The study found that the DSpace software has the most installations 35 (59 %), followed by E-prints 20 (33 %). Greenstone is used by 2 (3 %) repository and ranks at 3rd position. Nitya is used by only 1 repository.

3. OBJECTIVES

The main objectives of the study are to:

(a) Assess the status of open source software in India

(b) Institutions using open source software for library automation and/or for institutional repositories in public domain?

(c) Distribution of open source software in various states.

(d) Institutions by their type using OSS for library automation and institutional repository in public domain.

4. METHODOLOGY

Various sources have been used to find out the users of OSS in India such as visiting users' list available on the website of respective OSS, consulting case studies and research papers on OSS, searching on internet and communication with library professionals through various mailing lists such as NMLIS, LIS-Forum, etc.

Many academic institutions claim that they are using OSS for library automation and digital library. According to the list of KOHA users which is worldwide maintained by KOHA project volunteers; 83 libraries in India are using KOHA. The Directory of Open Access Repositories (http://www.opendoar.org/) and Registry of Open Access Repositories listed many Indian institutions using OSS for their digital/ institutional repository but this study included only those institutions that could be verified by online accessing to their online library catalogue and digital/institutional repository as on April 2014. The data collected through various methods about institutions that are using OSS was analysed and presented.

5. RESULTS AND ANALYSIS

5.1 Distribution of Open Source Library Automation Software

Table 1 shows that 73 (80.22 %) Indian Institutions are using KOHA followed by 10 (10.99 %) Institutions that are using NewGenLib for library automation. Only 8 (8.79 %) institutions are using OpenBiblio. No users found for Evergreen, ABCD, Emilda, Avanti, and other open source library management software in India on public domain.

Table 1. Distribution of open source library automation software used in India

S. No.	Software	No of institutions (%)
1.	KOHA	73 (80.22)
2.	NewGenLib	10 (10.99)
3.	OpenBiblio	08 (08.79)
	Total	91 (100.00)

5.2 Online Accessible Repositories

Table 2 presents distribution of 96 indentified repositories created by three different open source digital library/repository software. The list of organisations is with IRs/DLs using OSS are given in Appendix-1. It reveals that the majority of repositories 67 (69.79 %) are using DSpace OSS whereas 26 (27.08 %) are using E-prints. Greenstone is used by only 3 (3.13 %) repositories and stands at 3rd position. Although many

Table 2. Online accessible repositories using open source software in India

S. No	Software	No. of repositories (%)
1.	DSpace	67 (69.79)
2.	E-prints	26 (27.08)
3.	Greenstone	03 (03.13)
	Total	96 (100.00)

institutions claim that they are using OSS for library automation and digital library but it is not possible to trace and collect data about all the institutions that are using OSS offline in their library.

5.3 Type of Institutions using OSS

Table 3 shows the 166 institutions that are using OSS for library automation and digital repository in India at public domain. It is clear from table 5 that out of 166 institutions, 89 are academic institutions followed by 35 research institutions, 9 public libraries, 8 government organisations, 7 library consortium (union catalogues), 6 special libraries, 4 non-profit organisations, 2 schools and, 2 commercial organisations. 4 institutions are grouped in other category named National Institute of Science Communication and Information Resources (NISCAIR), Indian Academic of Sciences, National Informatics Centre (NIC) (Bibliographic Informatics Division) and INFLIBNET. Academic institutions are highest in number, which is 53.61 % of total number of institutions followed 21.08 % research institutions.

Table 3. Types of institutions using open source software

S. No.	Type of institutions	No. (%)
1.	Academic Institute	89 (53.61)
3.	Research Institute	35 (21.08)
4.	Public Library	9 (5.42)
7.	Government Organisation	8 (4.82)
5.	Library Consortium (Union Catalogue)	7 (4.22)
6.	Special Library	6 (3.61)
10.	Non-Profit Organisation	4 (2.41)
11.	Other	4 (2.41)
8.	School	2 (1.20)
9.	Commercial Organisation	2 (1.20)
	Total	166 (100)

Table 4 shows that 8 institutions in India developed two institutional repositories using OSS. Out of 8 institutions, 4 institutions named Cochin University of Science and Technology, Indian Institute of Technology (New Delhi), NISCAIR and INFLIBNET are using Dspace for their both repositories. Other 3 institutions named Indian Institute of Science (Bangalore), National Institute of Technology (Rourkela), and University of Mysore are using Dspace and E-print for their two different repositories. Indian Institute of Management (Kozhikode) is using Dspace and Greenstone for their two different repositories.

Table 5 shows that 14 institutions in India using OSS for both institutional repository as well as for library automation. Out of 14 institutions, 9 institutions, namely, Bose Institute, Cochin University of Science and Technology, Human Rights Law Network, IndraPrastha Institute of Information Technology, Indian Institute of Technology (Bombay), Jawaharlal Nehru Centre for Advanced Scientific Research, North-Eastern

Table 4. Institutions having two repositories using open source software

S. No.	Institutions	Software used
1.	Cochin University of Science and Technology	Dspace for both
2.	Indian Institute of Technology (New Delhi)	Dspace for both
3.	NISCAIR	Dspace for both
4.	INFLIBNET	Dspace for both
5.	Indian Institute of Management (Kozhikode)	Dspace and greenstone
6.	University of Mysore	Dspace and E-print
7.	Indian Institute of Science (Bangalore)	Dspace and E-print
8.	National Institute of Technology (Rourkela)	Dspace and E-print

Table 5. Institutions using open source software for library automation and digital repository

S. No.	Institutions	Software used
1.	Ashoka Trust for Research in Ecology and the Environment, Bangalore	KOHA & E-print
2.	Bose Institute, Kolkata	Dspace & KOHA
3.	Christ University Library, Bangalore	E-print & KOHA
4.	Cochin University of Science and Technology, Cochin	Dspace & KOHA
5.	Human Rights Law Network, New Delhi	Dspace & KOHA
6.	IndraPrastha Institute of Information Technology, New Delhi	Dspace & KOHA
7.	Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore	Dspace & KOHA
8.	North-Eastern Hill University, Shillong	Dspace & KOHA
9.	O.P. Jindal Global University, Sonipat	Dspace & KOHA
10.	S-VYASA University(Swami Vivekananda Yoga Anusandhana)	Dspace & KOHA
11.	University of Mysore, Mysore	Dspace, Epirnt & KOHA
12.	Indian Agricultural Research Institute, Delhi	Eprint & KOHA
13.	Osmania University, Hyderabad	Dspace & NewGenLib
14.	Indian Institute of Technology, Bombay	Dspace & KOHA

Hill University, O.P. Jindal Global University and S-VYASA University using Dspace and KOHA. Also 3 institutions, namely, Ashoka Trust for Research in Ecology and the Environment, Christ University Library and Indian Agricultural Research Institute using E-print and KOHA. The Osmania University using Dspace and NewGenLib and University of Mysore using Dspace, Eprint and KOHA as Mysore University having two repositories.

Table 6 shows that state-wise distribution of 166 Indian Institutions that are using open source digital library software. It is evident from the Table 7 that out of 166 institutions, majority of institutions i.e., 34 (20.48 %) are from Karnataka followed 25 (15.06 %) institutions from New Delhi, 20 (12.05 %) from Maharashtra, 15 (9.04 %) from Tamil Nadu, 12 (7.23 %) from West Bengal, 10 (6.02 %) institutions form Kerala, 8 (4.82) from Gujrat, 7 (4.22 %) from Uttar Pradesh and 5 (3.01 %) from Andhra Pradesh and Haryana respectively.

5.4 Implementation of OS Library Management Software

It was observed from the web OPAC of each institution and received responses that out of 91 installations of open source library management software in India (Appendix-2), 42 (46.15 %) installations of open source library management software were done by software companies, 10 (10.99 %) installations by library staff and 8 (8.79 %) installations were done by IT staff. The installation sources of 31 institutions not traced, as they have not given any information on their OPAC.

Table 8 shows that out of 42 installations of open source library management software from software company in India, highest installations 30 (71.43 %) were done by Nucsoft OSS Labs followed by 7(16.67 %) installations from OpenLX Technologies Pvt. Ltd. and 3 (7.14 %) installations from First Ray Consulting in India.Only one installation was found from Mahiti Infotech and Ximerono respectively.

Table 6. State-wise distribution of institutions using open source digital library software

S. No.	State	No. of institutions (%)
1.	Karnataka	34 (20.48)
2.	New Delhi	25 (15.06)
3.	Maharashtra	20 (12.05)
4.	Tamil Nadu	15 (9.04)
5.	West Bengal	12 (7.23)
6.	Kerala	10 (6.02)
7.	Gujrat	8 (4.82)
8.	Uttar Pradesh	7 (4.22)
9.	Andhra Pradesh	5 (3.01)
10.	Haryana	5 (3.01)
11.	Madhya Pradesh	4 (2.41)
12.	Punjab	4 (2.41)
13.	Goa	3 (1.81)
14.	Uttarakhand	3 (1.81)
15.	Himachal Pradesh	2 (1.20)
16.	Meghalaya	1 (0.60)
17.	Orrisa	2 (1.20)
18.	Rajasthan	2 (1.20)
19.	Chhattisgarh	1 (0.60)
20.	J & K	1 (0.60)
21.	Jharkhand	1 (0.60)
22.	Puducherry	1 (0.60)
	Total	166 (100)

Table 7. Implementation of open source library management software

S. No.	Implementors	No. of installations (%)
1.	Software Company	42 (46.15)
2.	Library Staff	10 (10.99)
3.	IT Staff	8 (08.79)
4.	Not Traced	31 (34.07)
	Total	91 (100)

Table 8. Implementation of open source library management software by software company

S. No.	Software Company	No of installations (%)
1.	Nucsoft OSS Labs	30 (71.43)
2.	OpenLX Technologies Pvt. Ltd.	7 (16.67)
3.	First Ray Consulting	3 (7.14)
4.	Mahiti Infotech	1 (2.38)
5.	Ximerono	1 (2.38)
	Total	42 (100)

6. CONCLUSIONS

Information technology has important role in rural, industrial, cultural and research development of any country. It is virtually impossible to carry out any meaningful educational activities without the help of libraries and information services. There are many OSS applications available for every educational activities including library automation, content management system, instituional repository, learning management, and digital library. OSS can offer cheap and advanced solutions to Indian libraries. The library professionals of India awareness, perceptions and intentions to adopt OSS in libraries but most of library professionals in India still lack of required technical knowledge and facilities for

successfull implementation of OSS in libraries. However, adoptions of OSS in Indian libraries is increasing day by day but at slow speed. While a number of open source library management software users reported in India but the numbers of OPACs that are operational and available in public domain are fewer. It is clear from the study that only 91 institutions in India using open source library management software with their OPAC in public domain. Out of 91 institutions, 73 institutions are using KOHA, 10 organisation using NewGenLib and 8 institutions using OpenBiblio. There are no users found in India for other open source library management software such as Evergreen, Avanti, E-mail, GNU library management system etc. It also clear from table 2 that total 96 open access repositories created by OSS are accessible in India on public domain. Out of 96 repositories, 67 are created by using Dspace, 26 created by using E-print and 3 repositories created by using Greenstone.

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Appendix - I

List of organisations with institutional repository/digital library using OSS in public domain

	Name of organisation	URL	OSS
1.	Advanced Materials and Processes Research Institute, Bhopal	http://E-prints.ampri.res.in/	E-print
2.	Aryabhatta Research Institute of Observational Sciences, Nainital	http://210.212.91.105:8080/jspui/	Dspace
3.	Ashoka Trust for Research in Ecology and the Environment, Bangalore	http://E-prints.atree.org/	E-print
4.	Bose Institute, Kolkata	http://resources.boseinst.ernet.in:8080/jspui/	Dspace
5.	Central Building Research Institute, Roorkee	http://www.krc.cbri.res.in/dspace/	Dspace
6.	Central Drug Research Institute, Lucknow	http://dkr.cdri.res.in:8080/dspace/index.jsp	Dspace
7.	Central Food Technological Research Institute	http://ir.cftri.com/	E-print
8.	Central Institute of Medicinal and Aromatic Plants,Lucknow	http://kr.cimap.res.in/index.jsp	Dspace
9.	Central Institute of Plastic Engineering & Technology, Chennai	http://www.cipetlibrary.gov.in/jspui/	Dspace
10.	Central Marine Fisheries Research Institute, Cochin	http://E-prints.cmfri.org.in	E-print
11.	Centre for Good Governance, Hyderabad	http://dspace.cgg.gov.in/dspace/	Dspace
12.	Christ University	http://repository.christuniversity.in/	E-print
13.	CMR Institute of Technology, Bangalore	http://www.cmrlibrary.in/	Dspace
14.	Cochin University of Science and Technology, Cochin	http://dyuthi.cusat.ac.in/xmlui/	Dspace
15.	Cochin University of Science and Technology, Cochin	http://dspace.cusat.ac.in/jspui/	Dspace
16.	CSIR Unit for Research and Development of Information Products, Pune	http://E-prints.csirexplorations.com/	E-print
17.	CSIR-Institute of Microbial Technology, Chandigarh	http://crdd.osdd.net/open/	E-print
18.	CSIR-The National Physical Laboratory (NPL)	http://npl.csircentral.net/	E-print
19.	Delhi Technological Univeristy	http://61.16.156.122/	Dspace
20.	Dr. Mohan's Diabetes Specialities Centre,Diabetes, Chennai	http://mdrf-E-prints.in/	E-print
21.	Gokhale Institute of Politics and Economics (Dhananjayarao Gadgil Library),Pune	http://dspace.gipe.ac.in/jspui/	Dspace
22.	Guru Gobind Singh Indraprastha University, Delhi	http://dspace.ipu.edu:8080/xmlui	Dspace
23.	High Court of Karnataka	http://judgmenthck.kar.nic.in/judgments/	Dspace
24.	Human Rights Law Network, New Delhi	http://109.74.198.40:8087/jspui/	Dspace
25.	Indian Academy of Sciences, Bangalore	http://repository.ias.ac.in/	E-print
26.	Indian Agricultural Research Institute, Delhi	http://E-prints.iari.res.in/	E-print
27.	Indian Association for the Cultivation of the Science, Kolkata	http://arxiv.iacs.res.in:8080/jspui/	Dspace
28.	Indian ETD Repository @ INFLIBNET	http://shodhganga.inflibnet.ac.in/	Dspace
29.	Indian Institute of Advanced Studies, Shimla	http://library.iias.ac.in/dspace	Dspace
30.	Indian Institute of Astrophysics, Bangalore	http://prints.iiap.res.in/	Dspace
31.	Indian Institute of Chemical Biology (IICB), Kolkata	http://www.E-prints.iicb.res.in/	E-print
32.	Indian Institute of Horticultural Research, Bengaluru	http://www.erepo.iihr.ernet.in/	Dspace
33.	Indian Institute of Management, Kozhikode	http://dspace.iimk.ac.in/	Dspace
34.	Indian Institute of Management, Kozhikode	http://www.iimk.ac.in/gsdl/cgi-bin/library	Greenstone
35.	Indian Institute of Science, Bangalore	http://etd.ncsi.iisc.ernet.in/	Dspace
36.	Indian Institute of Science, Bangalore	http://E-prints.iisc.ernet.in/	E-print
37.	Indian Institute of Spices Research, Kozhikode	http://220.227.138.214:8080/dspace/index.jsp	Dspace
38.	Indian Institute of Technlogy, Roorkee,	http://bhagirathi.iitr.ac.in/dspace/	Dspace
39.	Indian Institute of Technology, Bombay	http://dspace.library.iitb.ac.in/jspui/	Dspace
40.	Indian Institute of Technology, Kharagpur	http://anwesan.iitkgp.ernet.in:8080/jspui/	Dspace

41.	Indian Institute of Technology, New Delhi	http://eprint.iitd.ac.in/dspace/	Dspace
42.	Indian Institute of Technology, New Delhi	http://eprint.iitd.ac.in/seed/	Dspace
43.	Indian Statistical Institute, Kolkata	http://library.isical.ac.in/jspui/	Dspace
44.	Indira Gandhi Institute of Development Research, Mumbai	http://oii.igidr.ac.in:8080/jspui/	Dspace
45.	Indira Gandhi National Open University, New Delhi	http://www.egyankosh.ac.in/	Dspace
46.	Indraprastha Institute of Information Technology	https://repository.iiitd.edu.in/jspui/	Dspace
47.	INFLIBNET's Institutional Repository	http://ir.inflibnet.ac.in/	Dspace
48.	Institute of Mathematical Sciences, Chennai	http://www.imsc.res.in/xmlui	Dspace
49.	Institute of Minerals and Materials Technology, Bhubaneswar	http://E-prints.immt.res.in/	E-print
50.	International Crops Research Institute for the Semi-Arid-Tropics (ICRISAT)	http://oar.icrisat.org/	E-print
51.	Inter-University Centre for Astronomy and Astrophysics, Pune	http://www.iucaa.ernet.in:8080/jspui/	Dspace
52.	Jadavpur University, Kolkata	http://dspace.jdvu.ac.in/	Dspace
53.	Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR),Bangalore	http://lib.jncasr.ac.in:6060/jspui/	Dspace
54.	KLE University,Belgaum	http://182.48.228.18:8080/jspui/	Dspace
55.	LDL: Librarian's Digital Library (DRTC)	http://drtc.isibang.ac.in/xmlui/	Dspace
56.	Maharaja Sayajirao University of Baroda	http://14.139.121.106:8080/jspui/	Dspace
57.	Manipal University	http://E-prints.manipal.edu/	E-print
58.	Ministry of Earth Sciences,Government of India	http://moesE-prints.incois.gov.in/	E-print
59.	National Aerospace Laboratories, Banglore	http://nal-ir.nal.res.in/	E-print
60.	National Center for Catalysis Research, IIT Madras	http://catalysis.E-prints.iitm.ac.in/	E-print
61.	National Centre for Antarctic and Ocean Research (NCAOR), Goa	http://dspace.ncaor.org:8080/dspace/index.jsp	Dspace
62.	National Centre for Radio Astrophysics, Pune	http://ncralib1.ncra.tifr.res.in:8080/jspui/	Dspace
63.	National Chemical Laboratory, Pune	http://ncl.csircentral.net/	E-print
64.	National Informatics Centre (Bibliographic Informatics Division)	http://openmed.nic.in/	E-print
65.	National Institute of Oceanography (NIO), Goa	http://drs.nio.org/drs/index.jsp	Dspace
66.	National Institute of Science Communication and Information Services, New Delhi	http://nopr.niscair.res.in/	Dspace
67.	National Institute of Science Communication and Information Services, New Delhi	http://nsdl.niscair.res.in/	Dspace
68.	National Institute of Technology Rourkela	http://ethesis.nitrkl.ac.in/	E-print
69.	National Institute of Technology, Rourkela (NITR)	http://dspace.nitrkl.ac.in/dspace/	Dspace
70.	National Metallurgical Laboratory, Jamshedpur	http://E-prints.nmlindia.org/	E-print
71.	National Tuberculosis Institute (NTI), Bangalore	http://tbresearch.ntiindia.org.in/	E-print
72.	North-Eastern Hill University, Shillong	http://dspace.nehu.ac.in/	Dspace
73.	O P Jindal Global University, Sonipat	http://dspace.jgu.edu.in:8080/dspace/	Dspace
74.	Osmania University,Hyderabad	http://oudl.osmania.ac.in/	Dspace
75.	Pandit Deendayal Petroleum Univeristy, Gandhinagar	http://library.pdpu.ac.in:8080/xmlui/	Dspace
76.	Parliament of India, Official Debates of Rajya Sabha	http://rsdebate.nic.in/	Dspace
77.	Physical Research Laboratory, Ahmedabad	http://www.prl.res.in/~library/	Greenstone
78.	Pondicherry University	http://dspace.pondiuni.edu.in/jspui/	Dspace
79.	Rajiv Gandhi University of Health Sciences, Bangalore	http://119.82.96.198:8080/jspui/	Dspace
80.	Raman Research Institute, Bangalore	http://dspace.rri.res.in/	Dspace
81.	S.D.M College of Engineering & Technology, Dharwad	http://210.212.198.149:8080/jspui/	Dspace
82.	Saurashtra University, Rajkot	http://etheses.saurashtrauniversity.edu/	E-print
83.	Shree Narayana Gurukulm College of Engineering, Kadayiruppu	http://dspace.sngce.ac.in/	Dspace

84.	Society for Participatory Research in Asia (PRIA's Digital Library)	http://digitallibrary.pria.in/cgi-bin/library?a=p&p=home&l=en&w=utf-8	Greenstone
85.	Sree Chitra Tirunal Institute for Medical Sciences & Technology, Triruvanthapuram	http://dspace.sctimst.ac.in/jspui/	Dspace
86.	SRM University,Chennai	http://digitallibrary.srmuniv.ac.in/dspace/	Dspace
87.	St.Joseph's College, Trichy	http://despace.sjctni.edu:8080/jspui/	Dspace
88.	S-VYASA University (Swami Vivekananda Yoga Anusandhana Samsthana), Bangalore	http://www.libraryofyoga.com/	Dspace
89.	Thapar University, Patiala	http://dspace.thapar.edu:8080/dspace/	Dspace
90.	University of Delhi	http://dspace.dce.edu/	Dspace
91.	University of Kashmir, Srinagar	http://dspaces.uok.edu.in:8080/jspui/	Dspace
92.	University of Mysore	http://dspace.vidyanidhi.org.in:8080/dspace/	Dspace
93.	University of Mysore	http://E-prints.uni-mysore.ac.in/	E-print
94.	Vidya Prasarak Mandal, Thane	http://dspace.vpmthane.org:8080/jspui/index.jsp	Dspace
95.	West Bengal Public Library Network	http://dspace.wbpublibnet.gov.in:8080/jspui/	Dspace
96.	WHO Institutional Repository (India)	http://whoindia.healthrepository.org/	Dspace

Appendix – II

List of organisations using open source library management software with their online OPAC

S. No	Name of organisation	Web-OPAC	OSS
1.	AJ Institute of Management, Mangalore	http://aj-koha.osslabs.biz/	Koha
2.	All India Institute of Speech and Hearing, Mysore	http://aiishmysore.in/openbiblio/opac/index.php(E-book collection) http://aiishmysore.in/openbibliocdrom/opac/index.php(book CD-ROM)	OpenBiblio
3.	Alliance University, Bangalore	http://library.alliance.edu.in/	Koha
4.	Altersoft Library, Cochin	http://library.altersoft.co/opac/index.php	OpenBiblio
5.	Amity International Schools, Delhi	http://amity-libcat.osslabs.biz/	Koha
6.	Amity Univerity Library, Noida	http://library.amizone.net/ or http://202.12.103.54/	Koha
7.	Amity University, Gurgaon (Manesar)	http://27.124.12.187/	Koha
8.	Amity University, Gwalior	http://182.19.64.94/	Koha
9.	Anveshi Research Centre for Women's Studies, Hyderabad	http://www.anveshi.org.in/library/catalogue/	OpenBiblio
10.	Archives and Access, Bangalore	http://publicarchives.org/catalogue-search.html	Koha
11.	Ashoka Trust for Research in Ecology and the Environment, Bangalore	http://opac.atree.org/	Koha
12.	Azim Premji University, Bangalore	http://library.azimpremjiuniversity.edu.in/cgi-bin/koha/opac-search.pl	Koha
13.	Bhaktivedanta Research Centre, Kolkata	http://koha.brcindia.com/	Koha
14.	Bhavans College, Mumbai	http://bhavans-koha.osslabs.biz/	Koha
15.	Birla Instittue of Management Technology	http://210.212.115.113:8080/newgenlibctxt/Opac2_0.jsp	NewGenLib
16.	Bose Institutue,Kolkata	http://resources.boseinst.ernet.in:8007/cgi-bin/koha/opac-shelves.pl?display=privateshelves	Koha
17.	British Council Libraries, India	http://www.library.britishcouncil.org.in/	Koha
18.	C Abdul Hakeem College of Engineering and Technology,Melvisharam	http://opac-ccl.cahcet.in/	Koha
19.	CCS Haryana Agricultural University, Hisar	http://202.141.47.7/	Koha
20.	Central University of Kerala, Vidyanagar	http://117.211.90.250/cgi-bin/koha/opac-search.pl	Koha

21.	Chennai Mathematical Institute,Kelambakkam	http://61.12.114.66:8000/	Koha
22.	Chitkara Central Library ,Patiala	http://library.chitkara.edu.in/	Koha
23.	Choe Khor Sum Ling (CKSL) ,Bangalore	http://www.cksl.in/library.html	Koha
24.	Christ University Library, Bangalore	http://library.christuniversity.in/	Koha
25.	Cochin University of Science and Technology, Chochin	http://opac.cusat.ac.in/	Koha
26.	Connemara Public Library	http://connemara.tnopac.gov.in/	Koha
27.	DC School of Management and Technology, Vagamon	http://opac.dcschool.net/cgi-bin/koha/opac-main.pl	Koha
28.	Delhi Public Library, Delhi	http://59.176.17.111/	Koha
29.	Dombivali Public Library, Mumbai	http://catalog.dombivali-granthalaya.org/	Koha
30.	Don Bosco Institute of Technology, Mumbai	http://opac.dbit.in/	Koha
31.	Filiko Books, Hyderabad	http://www.filikobooks.com/cgi-bin/koha/opac-user.pl	Koha
32.	Fountainhead School , Surat	http://koha.fountainheadschools.org/	Koha
33.	Goa University	http://libcat.unigoa.ac.in/	Koha
34.	Gogte Institute of Technology, Belgaum	http://library.git.edu/	Koha
35.	Human Rights Law Network, Delhi	http://koha.hrln.org/	Koha
36.	Independent Library Consortium, Bangalore	http://www.ilc-bengaluru.org/	Koha
37.	Indian Agricultural Research Institute, New Delhi	http://14.139.56.71/	Koha
38.	Indian Institute of Management, Ahmedabad	http://vslopac.iimahd.ernet.in/	Koha
39.	Indian Institute of Science Education and Research, Mohali	http://115.119.172.69/	Koha
40.	Indian Institute of Technology, Bombay	http://opac.library.iitb.ac.in/cgi-bin/koha/opac-user.pl	Koha
41.	Indian Institute of Technology, Mandi	http://14.139.34.4/cgi-bin/koha/opac-main.pl	Koha
42.	Indian Institute Technology, Jodhpur	http://172.16.100.55:8081/newgenlibctxt/	NewGenLib
43.	Indian Social Institute, Delhi	http://isi-koha.osslabs.biz/	Koha
44.	Indian Sylvestrine Benedictine Libraries, India	http://www.isblibraries.org/	Koha
45.	Indira Gandhi Delhi Technical University for Women, New Delhi	http://202.159.218.126:8080/newgenlibctxt/	NewGenLib
46.	Indira Gandhi Krishi Vishwavidyalya, Raipur	http://igkvkohaopac.firstray.in/	Koha
47.	IndraPrastha Institute of Information Technology, New Delhi	http://library.iiitd.edu.in/	Koha
48.	Institute for Financial Management and Research, Chennai	http://library.ifmr.ac.in/cgi-bin/koha/opac-user.pl	Koha
49.	Institute of Advanced Management and Researech, New Delhi	http://27.124.19.188:8080/newgenlibctxt/Home?Id=1	NewGenLib
50.	International Commission on Irrigation and Drainage (ICID), New Delhi	http://www.icid.org/members_only/openbiblio/opac/index.php	OpenBiblio
51.	Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore	http://lib.jncasr.ac.in:8081/	Koha
52.	Joint Library Committee, Bangalore	http://jlc-koha.osslabs.biz/	Koha
53.	Kalpataru Recreation Libraries Pvt.Ltd., Pune	opac.kalibindia.com	Koha
54.	Karnataka Legislature e-Library	http://164.100.133.227:8080/newgenlibctxt/Home?Id=1	NewGenLib
55.	Kodaikanal International School, Kodaikanal	http://koha.kis.in//	Koha
56.	Madras Club, Chennai	http://library.madrasclub.org/	Koha
57.	Marwadi Education Foundation's Group of Institutions, Rajkot	http://119.160.199.88/	Koha
58.	Matru Kripa Jyothish Gurukula Library	http://www.mkjg.org/lms/opac/index.php	OpenBiblio
59.	MIG Cricket Club, Mumbai	http://mig-koha.osslabs.biz/	Koha
60.	National Dairy Research Institute, Karnal	http://library.ndri.res.in/	Koha

61.	National Film Archive of India ,Pune	http://nfai.libry.in/	Koha
62.	National Institute of Abiotic Stress Management, Pune	http://117.239.43.84:8000/	Koha
63.	National Institute of Siddha, Chennai	http://www.nischennai.org/nislib/opac/index.php	OpenBiblio
64.	National Law Institute University, Gyan Mandir Library, Bhopal	http://210.212.145.132/cgi-bin/koha/opac-shelves.pl	Koha
65.	National Library Automation & Resource Sharing Network	http://n-larn.ac.in/libmis/?q=node/3	Koha
66.	Nehru Centre Library, Mumbai	http://nehrucen-koha.informindia.co.in/	Koha
67.	North-Eastern Hill University, Shillong	http://library.nehu.ac.in/	Koha
68.	O. P. Jindal Global University Library, Sonepat, Haryana	http://koha.jgu.edu.in/	Koha
69.	Osmania University Library, Hyderbad	http://14.139.82.46:8080/newgenlibctxt/	NewGenLib
70.	Pillai Group of Institutions, Mumbai	http://pillai-koha.osslabs.biz/	Koha
71.	Power Grid Corporation of India Limited, Gurgaon	http://203.122.7.158/cgi-bin/koha/opac-main.pl	Koha
72.	Public Archives, India, Bangalore	http://pubarch-koha.osslabs.biz/	Koha
73.	Punjabrao Deshmukh Krishi Vidyapeeth, Akola	http://pdkvopac.firstray.in/	Koha
74.	Rishiraj Institute of Technology, Indore	http://122.168.192.132:8080/newgenlibctxt/Home?Id=1	NewGenLib
75.	Roja Muthiah Research Library, Chennai	http://www.rmrl.in:8000/	Koha
76.	Sacred Heart College, Kochi	http://shcollege.in/cgi-bin/koha/opac-user.pl	Koha
77.	Sadharan Brahmo Samaj Library, Kolkata	http://library.thesadharanbrahmosamaj.org/catalogue/opac/index.php	OpenBiblio
78.	Sandip Institute of Technology and Research Center, Nashik	http://117.239.187.197/cgi-bin/koha/opac-main.pl	Koha
79.	SDM Institute for Management Development, Mysore	http://118.151.209.34:8080/newgenlibctxt/Opac2_0.jsp	NewGenLib
80.	Shiv Nadar University,Dadri	http://210.212.85.104/	Koha
81.	Siddaganga Institute of Technology, Tumkur, Karnataka	http://opac.sit.ac.in:8080/newgenlibctxt/Home?Id=1	NewGenLib
82.	South Asian University Library, New Delhi	http://library.sau.ac.in/	Koha
83.	SRM University Delhi-NCR Campus Central Library, Ghaziabad	http://117.239.12.74:8080/newgenlibctxt/Home?Id=1	NewGenLib
84.	SVYASA Yoga University (SARASWATI CENTRAL LIBRARY),Bengaluru	http://catalog.libraryofyoga.com/	Koha
85.	Tailor Bird Children's Library, Bangalore	http://library.thetailorbird.com/	Koha
86.	Universal Training Solutions, Mumbai	http://uts-koha.osslabs.biz/	Koha
87.	University of Agricultural Sciences, Bangalore	http://uasb.agrilibindia.org/	Koha
88.	University of Mysore, Mysore	http://libcat.mysore-univ.org/	Koha
89.	Urban Health Resource Centre (UHRC)	http://uhrc.in/library/home/index.php	OpenBiblio
90.	West Bengal Pollution Control Board (WBPCB)	http://library.wbpcb.gov.in/cgi-bin/koha/opac-main.pl	Koha
91.	West Bengal Universtiy of Technology	http://opac.wbut.ac.in/cgi-bin/koha/opac-main.pl	Koha