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# COMPARATIVE STUDY OF FREE/OPEN SOURCE INTEGRATED LIBRARY MANAGEMENT SYSTEMS (FOSILMS) WITH REFERENCE TO KOHA, NEWGENLIB AND E-GRANTHALAYA

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## Abstract

*The paper aims to study the Free/Open source integrated library management systems like Koha, Newgenlib and e-Granthalaya. A thorough analysis of all the three software's has been done and listed the features available in all the three ILMS. Koha and Newgenlib has more advanced and varied features than e-Granthalaya. e-Granthalaya has simple interface with less options and easy to use and install. Overall Newgenlib has more enhanced features that are significant for library automation and it can be selected as ILMS.*

**KEYWORDS :**

Open Source software, Library Automation, Koha, Newgenlib, e-Granthalaya

## INTRODUCTION:

Due to the advancement of technology the libraries are forced to adopt new technology. The libraries adopted the technologies in Library automation, digital library, content management systems, journal publishing, information management, electronic resource management etc. The Free/open source movement has brought the revolution in the field of library science, the developers, contributors and open source software users have turned more and more to free/open source software (FOSS). The FOSS is hosting on cloud computing to overcome the challenges of technical support and other aspects of the security.

For open source software's the source code is free to edit, modify and redistribute to others but for Free software's the source code may not available for modify but software can be used for free and it can redistribute to any numbers. These FOSS are helping the libraries with financial crunches and the librarians to get the wider scope for their carrier. Here the detailed study of Free/open source integrated library management systems for library automation, it helps the librarians to select the best open source software for library automation.

## RESEARCH METHODOLOGY:

The Free/Open Source Integrated Library Management software's are installed on test bed and studied the related literature thoroughly and also consulted the users of the software like Newgenlib and e-Granthalaya and Koha studied practically. Listed the most common features that are available in ILMS and listed the available () and Non-available (X) items of the software's.

**Review of Literature:**

Cargile, Cathleen (2005) examines the potential of open source integrated library systems (OSILS) and their applications. He pays particular attention to four OSILS software's like Koha, Emilda, MyPhpLibrary, and Learning Access ILS. Brief notes are included relating to OS operating systems and programming languages.

Russo Gallo, Patricia (2007) describes the characteristics of the open source library management software, PMB, including licensing, requirements and functionality, then they analyses the features of the different modules and the OPAC. The author considers PMB to be appropriate for both large and small libraries and document centres, enumerating examples of existing applications in Catalan libraries.

Bissels, Gerhard (2008) describes the selection process and criteria of implementation of Koha 3.0 at the Complementary and Alternative Medicine Library and Information Service (CAMLIS), Royal London Homoeopathic Hospital. Koha 3.0 was selected because of the GNU license was considered more future-proof than proprietary products, and more open to customization to meet the special needs of the library.

Dalziel, Karin (2008) reveals the OSS solutions to meet the needs of library patrons and disadvantages of OSS in respect of support by vendors and volunteers. Today, libraries can choose open source and enjoy the benefits of full support and turnkey hosting for open source ILSs. In the US, libraries currently have two options: LibLime, which supports the open source products Koha and Evergreen, and Equinox supports Evergreen only. This paper takes a look at LibLime, primarily their Koha and Koha ZOOM offerings.

Helling, John (2010) compared the two leading open source library management system (LMS) packages and highlights the reasons behind a switch from one open source provider to another. It is based on practical experience. Koha and Evergreen ILMs are presented in terms of their current use as well as their future directions of development and opportunities. He compared the history of Koha and Evergreen. The former is criticized because of the recent "fork," i.e. commercial use of open source code. Problems with a local implementation of Koha are also discussed. Evergreen however, since it was developed by a library consortium, appeared the better choice for the Indiana Shared Library Catalog (ISLC), a consortium of different libraries in Indiana.

Sunil, M V & Harinarayana, N S (2011) reveals that the requirements of Indian college libraries in ILS products in general and Open Source Integrated Library Systems in particular. The requirements are analyzed for the housekeeping modules and viability indicators by direct questioning. The performance of the 9 OSILS Products ABCD, Emilda, Evergreen, Koha, NewGenLib, OPALS, OpenBiblio, PMBILS and PhpMyLibrary is evaluated against the listed requirements.

Muller, Tristan (2011) seeks to present the results of an analysis of 20 free and open source ILS platforms offered to the library community. These software platforms were subjected to a three-step analysis, whereby the results aim to assist librarians and decision makers in selecting an open source ILS, based on objective criteria. More than 20 open source ILSs were tested, but only three passed all the steps: Evergreen, Koha, and PMB. The main goal is not to identify the best open source ILS, but rather to highlight from which, of the batch of dozens of open source ILSs, librarians and decision makers can choose without worrying about how perennial or sustainable each open or free project is, as well as understanding which ILS provides them with the functionalities to meet the needs of their institutions.

**Overview of Integrated Library Management Systems:**

Koha: It is developed in the year 1999 by Kaptio Communications for the Horowhenua Library Trust of New Zealand. Koha is web based open source integrated library system used world-wide by public libraries, special libraries and educational institutions. The catalogue data is stored in MARC format and accessible through Z39.50 servers. It has using Web 2.0 technology for tagging and to feed RSS. It also the Union cataloguing to unity the group of catalogues and also no vendor lock-in.

Newgenlib: It is an open source integrated Library Management system developed by Verus Solutions Pvt. Ltd. with Kesavan Institute of Information and Knowledge management, Hyderabad, India and released in the year 2005. It is web based software using JAVA and has multi-tier architecture. It is a compliant of MARC format and OAI-PMH and Z39.50. It has RFID integration and supports multi-user and multiple security levels. The latest versions are supporting the Android Mobiles and

tablets to find out the transactions of users of the Library.

e-Granthalaya: It is an free automation software from National Informatics centre, Department of Electronics and Information Technology, Ministry of communications and Information Technology, Government of India. The software is provided at Zero cost to the Ministries, Departments, Public Libraries, Academic Libraries and other public and private sector libraries. The support, training, maintenance, migration, etc are provided on payment basis. It is a web based and compliant of MARC and Z39.50 formats. It has also Unicode support for multilingual languages.

## ANALYSIS AND DISCUSSIONS:

To install the ILMS software one should know the essential technical knowledge of the different design and architectural components of the software. Table 1 depicts the essential technical specifications of the software for installation and to run on the platform.

Koha is written on Perl/Python/PHP can be installed on Linux, MAC OS and Windows platforms. To run the Koha YAZ, Zebra and Perl scripts can be installed. Perl scripts act as buffer between the application and database through web servers. The data can be stored in MySQL or Oralce database servers. Koha can be accessed through browser based clients no need of plug-in. Newgenlib is written on JAVA and can be installed on Windows and Linux platforms. J2SDK is needed to run the Newgenlib on application server and JAVA plug-in Java Runtime Environment is require to run the application on clients. Application server JBoss, web server like Tomcat and database like PostgreSQL need to be installed. E-Granthalaya is written on ASP.NET and can be installed only on Windows. .NET is required to run the application on both server and clients. Data can be stored in MS SQL server through Internet Information Server (IIS) web server and application server ODBC.

All three software has graphical user interface, Newgenlib, Koha and e-Granthalaya supports international and Indian languages. From the above analysis it can seen that the technology involved in design architecture of software is different from each other, whereas Koha is based on Perl, Newgenlib is completely based on Java and e-Granthalaya is based on ASP.NET. Koha and Newgenlib uses complex technology but e-Granthalaya uses simple technology, so it is easy to install. But e-Granthalaya uses only commercial software and run only on Windows platforms, that why cost involvement is there to run the application.

**Table 1: Technical specification of the Software's**

| Sl. No. | Technical Specifications | Koha | Newgenlib | e-Granthalaya |
|---|---|---|---|---|
| 1 | Version | 3.0 | 3.0 | 3.0 (Network Edition), Rev.19 |
| 2 | Operating systems (Server and Client) | Linux/Windows | Linux/Windows | Windows |
| 3 | Programming language | Perl / PHP | JAVA | ASP.NET |
| 4 | Application server | Active state Perl Modules | JBoss | ODBC |
| 5 | Web server | Apache | JBoss Tomcat | Internet Information server (IIS ) |
| 6 | Database Server | MySQL, Oralce | PostgreSQL or MySQL | MS SQL Server 2000/2005 Standard edition |
| 7 | Client | Browser based | J2SE | .NET Framework 2.0 |
| 8 | Interface | GUI | GUI | GUI |

To automate various housekeeping operations of any library the various modules are required in the software. Table 2 shows the functional modules of the ILMS software's. All the three software's having all most all modules. Koha is not having the Modules like Micro documents, CAS/SDI and Newspaper clippings modules, Newgenlib not having the Micro documents and Newspaper clippings

modules, but e-Granthalaya is not having the Digital library module. e-Granthalaya is having all most all the modules but standards are not implemented in it and it is to use and install on machines.

**Table 2: Functional Modules**

| Sl No. | Functional Modules | Koha | Newgenlib | e-Granthalaya |
|---|---|---|---|---|
| 1 | Circulation | ✓ | ✓ | ✓ |
| 2 | Acquisitions | ✓ | ✓ | ✓ |
| 3 | Serials | ✓ | ✓ | ✓ |
| 4 | Cataloguing | ✓ | ✓ | ✓ |
| 5 | Reports | ✓ | ✓ | ✓ |
| 6 | Budget | ✓ | ✓ | ✓ |
| 7 | Micro Documents | **X** | **X** | ✓ |
| 8 | CAS/SDI | **X** | ✓ | ✓ |
| 9 | Accession Register | ✓ | ✓ | ✓ |
| 10 | Digital Library | ✓ | ✓ | **x** |
| 11 | News Paper Clippings | **X** | **X** | ✓ |
| Note: **Availability (✓) and non-availability (X) of element/item** | | | | |

There are many general features in all the three software's and which are studied and analysed on the basis of their capability and functioning. Table 3 shows various general features of the Koha, Newgenlib and e-Granthalaya.

There are common features in all the three ILMS but e-Granthalaya has less features then Koha and Newgenlib. One the main thing that is not available in e-Granthalaya is source code, RFID integration but they are working out in the version 4.0 and it is not compatible with the Linux operating system. Koha is also not supports the RFID but Newgenlib supports the RFID integration. Koha and Newgenlib support the Z39.50 client for federated searching and e-Granthalaya is not having this feature but all the three ILMS are supports the Z39.50 for copy catalog. Both Koha and Newgenlib are Library standards compliant and uses open source components but e-Granthalaya are not developed under the standards, it uses only few and they are trying to bring in the coming versions.

**Table 3: General features**

| Sl. No. | General Features | Koha | Newgenlib | e-Granthalaya |
|---|---|---|---|---|
| 1 | Authority file and controlled vocabulary | ✓ | ✓ | ✓ |
| 2 | Client server architect | ✓ | ✓ | ✓ |
| 3 | Source code | ✓ | ✓ | **X** |
| 4 | Binaries installation | ✓ | ✓ | ✓ |
| 5 | Report generation | ✓ | ✓ | ✓ |
| 6 | Z39.50 client for federated searching | **X** | ✓ | **X** |
| 7 | Z39.50 copy cataloguing | ✓ | ✓ | ✓ |
| 8 | Article indexing | **X** | ✓ | ✓ |
| 9 | Zebra search engine | ✓ | **X** | **X** |
| 10 | Scalable, manageable, high speed and efficient | ✓ | ✓ | ✓ |
| 11 | Union cataloguing | ✓ | ✓ | ✓ |
| 12 | RFID integration | **X** | ✓ | **X** |
| 13 | Linux compatible | ✓ | ✓ | **X** |
| 14 | Windows compatible | ✓ | ✓ | ✓ |
| 15 | Give technical support after installation | ✓ | ✓ | ✓ |

| | | | | |
|---|---|---|---|---|
| 16 | **Intranet support** | ✓ | ✓ | ✓ |
| 17 | Retro conversion | ✓ | ✓ | ✓ |
| 18 | Library standards compliant | ✓ | ✓ | **X** |
| 19 | Use of open source components | ✓ | ✓ | **X** |
| 20 | Web-based interfaces | ✓ | ✓ | ✓ |
| 21 | Compatibility with international metadata standards and interoperability standards | ✓ | ✓ | **X** |
| 22 | No vendor lock-in | ✓ | ✓ | ✓ |
| 23 | Customization or minimum change | ✓ | ✓ | **X** |
| 24 | Stock taking | **X** | ✓ | ✓ |
| 25 | Network and standalone | ✓ | ✓ | ✓ |
| 26 | Internet compatibility | ✓ | ✓ | ✓ |
| **Note: Availability (✓) and non-availability (X) of element/item** | | | | |

Database is the one important feature of any automated system because it should meet the transaction load of any library. Table 4 reveals the database features of the three ILMS.

All the three software's allows for the data entry as per their needs but Koha uses duel database design so it can handle any transaction load (ASCII & RDBMS) but Newgenlib and e-Granthalaya is not having duel database design and they uses RDBMS for storing the data. Koha and Newgenlib do not have restriction on number of records but e-Granthalaya having restriction on number of records because it uses MS SQL server free edition if you purchase the enterprise edition then there is no restriction on number of records. All the three software's allows importing of MARC records from other sources. In e-Granthalaya data can be exported to text file, MS Access file, MARC 21 display format (Picture 1), MARC 21 communication format, MARCXML format (Picture 2), ISO:2709 format and to Microsoft Excel. In Koha and Newgenlib data can be exported to MARC format. In all the three ILMS data can be taken as backup but in Koha it is little bit complicated.

**Table 4: Database design**

| Sl. No. | Features | Koha | Newgenlib | e-Granthalaya |
|---|---|---|---|---|
| 1 | Data Entry | ✓ | ✓ | ✓ |
| 2 | Database Design (Dual) | ✓ | **X** | **X** |
| 3 | Restrictions on number of records | **X** | **X** | ✓ |
| 4 | Data import/export | ✓ | ✓ | ✓ |
| 5 | Data backup | ✓ | ✓ | ✓ |
| 6 | Database searchable | ✓ | ✓ | ✓ |
| Note: **Availability (✓) and non-availability (X) of element/item** | | | | |

Acquisition is the one of the important house-keeping operation of any automated system. This module should contain all most all the essential features, table 5 detailed about the acquisition module functions.

All the three ILMS are having very simple and straight options in acquisition administration and all the three having the almost all the features of acquisition functionalities. It is simpler in e-Granthalaya than the other two; it is very simple and free flow of process like process request, processing of supplies, ordering of items, accessioning and processing of payments. The acquisition module is little complicated in Newgenlib and Koha having simple and user friendly acquisition system.

**Table 5: Acquisition Module functions**

| Sl. No. | Acquisition functions | Koha | Newgenlib | e-Granthalaya |
|---|---|---|---|---|
| 1 | Acquisitions administration | ✓ | ✓ | ✓ |
| 2 | Configurations of Acquisitions | ✓ | ✓ | ✓ |
| 3 | Process request | ✓ | ✓ | ✓ |
| 4 | Processing of on approval supplies | ✓ | ✓ | ✓ |
| 5 | Firm orders | ✓ | ✓ | ✓ |
| 6 | Receive orders | ✓ | ✓ | ✓ |
| 7 | Delete invoices | ✓ | ✓ | ✓ |
| 8 | Processing of gifts | ✓ | ✓ | ✓ |
| 9 | Accessioning | ✓ | ✓ | ✓ |
| 10 | Delete accession number | ✓ | ✓ | ✓ |
| 11 | Processing of payments of invoices | ✓ | ✓ | ✓ |
| 12 | Payment details | ✓ | ✓ | ✓ |
| 13 | Claims of unsupplied items | ✓ | ✓ | ✓ |
| **Note:** Availability (✓) and non-availability (**X**) of element/item | | | | |

Cataloguing module is the mirror image of any library, it can reveals the holding of the library with a bibliographic details of an item. Table 6 shows the cataloguing administration in Koha contains MARC bibliographic framework and Newgenlib contains a classification number imported from catalogue record and e-Granthalaya also having the MARC framework for creating the bibliographic records. All the three software's process items ready for technical processing and also allows copy the catalogue records. The original cataloguing is very simple in e-Granthalaya than other two software's but in Koha it has lot of sub options available which may not required by many libraries. The catalogued records can be viewed through OPAC/WEBOPAC. The OAI-PMH is not available in Koha and e-Granthalaya but it is available in Newgenlib. Printing of catalogue in AACR2 and CCF is possible in Newgenlib and e-Granthalaya but it is not available in Koha. Barcode generation is also possible in all the three software's. From the above all it is clear that Newgenlib has good cataloguing module than other two.

**Table 6: Cataloguing module functions**

| Sl. No. | Cataloguing functions | Koha | Newgenlib | e-Granthalaya |
|---|---|---|---|---|
| 1 | Catalogue administration | ✓ | ✓ | ✓ |
| 2 | Retro-conversion | ✓ | ✓ | ✓ |
| 3 | Full cataloguing | ✓ | ✓ | ✓ |
| 4 | Import catalogue records from internet | ✓ | ✓ | ✓ |
| 5 | Modify catalogue records | ✓ | ✓ | ✓ |
| 6 | Search catalogue functionality | ✓ | ✓ | ✓ |
| 7 | OAI-PMH | **X** | ✓ | **X** |
| 8 | Abstracts | ✓ | ✓ | ✓ |
| 9 | Printing of catalogue in AACR2 format | **X** | ✓ | ✓ |
| 10 | Printing of catalogue in CCF format | **X** | ✓ | ✓ |
| 11 | Change copy status | ✓ | ✓ | ✓ |
| 12 | Barcode generation | ✓ | ✓ | ✓ |
| Note: **Availability (✓) and non-availability (X) of element/item** | | | | |

The circulation module is very important feature of any library to get access the resources of the library. Through this module user can borrow and return books and this also helps in collection development, weed out process, maintenance of the collection etc. Table 7 can reveal the basic information the circulation module.

All most all the features are available in all the three software's, circulation administration and configuration parameters are same but sub options may be different. In all the three software's issue, return and reservation facility is available, check in message is possible in Koha but Newgenlib and e-Granthalaya with this gate pass can also be printed. Printing of identity cards is possible in all the three ILMS and fines can be collected for overdue items in all the three ILMS. Newgenlib have the facility of integrating the RFID but it is not possible in Newgenlib and e-Granthalaya. In e-Granthalaya and Newgenlib weed out process is possible but it is not possible in Koha. It is observe that Koha and Newgenlib has the more options than e-Granthalaya but Newgenlib has more advanced features than other two.

**Table 7: Circulation module functions**

| Sl. No. | Circulation functions | Koha | Newgenlib | e-Granthalaya |
|---|---|---|---|---|
| 1 | Circulation Administration | ✓ | ✓ | ✓ |
| 2 | Configuration of parameters | ✓ | ✓ | ✓ |
| 3 | Issue & Return of items | ✓ | ✓ | ✓ |
| 4 | Reservation & Renewal of items | ✓ | ✓ | ✓ |
| 5 | E-mail alerts to members | ✓ | ✓ | ✓ |
| 6 | Print gate pass | ✓ | ✓ | ✓ |
| 7 | Collection of fines | ✓ | ✓ | ✓ |
| 8 | Printing of Identity cards | ✓ | ✓ | ✓ |
| 9 | Use of RFID | **X** | ✓ | **X** |
| 10 | Overdue notices | ✓ | ✓ | ✓ |
| 11 | Weed out process | **X** | ✓ | ✓ |
| **Note:** Availability (✓) and non-availability (**X**) of element/item | | | | |

There many issues related to serial module in open source as well as in commercial ILMS software's and which really needs efforts for their developments. This module deals with the functionality related subscription, management of serials, registration, missing issues etc. Table 8 deals with the functionality of the serial module.

Serial administration is more functional in Newgenlib with sub options to help the clients than Koha and e-Granthalaya. Serial parameters are preferred in all the three software's with unequal importance. In Newgenlib has more flexibility to add new subscriptions, ordering subscriptions, processing of invoices, payment details, cancelling or reordering which is quite poor in Koha and e-Granthalaya. Receiving of loose issues, sending reminders for unsupplied issues and renewal of subscription is possible in all the three ILMS but binding management is possible only in Newgenlib and it is not possible in Koha and e-Granthalaya. It is found from the study that serial management is better in Newgenlib than Koha and e-Granthalaya.

**Table 8: Serial module functions**

| Sl. No. | Serial functions | Koha | Newgenlib | e-Granthalaya |
|---|---|---|---|---|
| 1 | Administration | ✓ | ✓ | ✓ |
| 2 | Configuration | ✓ | ✓ | ✓ |
| 3 | Serial subscription details | ✓ | ✓ | ✓ |
| 4 | Add acquisition record | ✓ | ✓ | ✓ |
| 5 | Approval of serial | ✓ | ✓ | ✓ |
| 6 | Ordering | ✓ | ✓ | ✓ |
| 7 | Subscription maintenance | ✓ | ✓ | ✓ |
| 8 | Receive loose issues | ✓ | ✓ | ✓ |
| 9 | Reminders | ✓ | ✓ | ✓ |
| 10 | Renew subscriptions | ✓ | ✓ | ✓ |
| 11 | Binding management | **X** | ✓ | **X** |
| Note: **Availability (✓) and non-availability (X) of element/item** | | | | |

Catalogue is the mirror image of the library holdings, Online Public Access Catalogue plays an important role in access and use of resources. The Table 9 shows OPAC functionality and search facility of software's.

**Table 9: Online Access of Catalogue and Searching functions**

| Sl. No. | OPAC/WebOPAC/Searching functions | Koha | Newgenlib | e-Granthalaya |
|---|---|---|---|---|
| 1 | Web interface | ✓ | ✓ | ✓ |
| 2 | Basic search | ✓ | ✓ | ✓ |
| 3 | Advance search | ✓ | ✓ | ✓ |
| 4 | Browse by title, author, subject, year, publisher, etc | ✓ | ✓ | ✓ |
| 5 | Recent arrivals | ✓ | ✓ | ✓ |
| 6 | Status inquiry | ✓ | ✓ | ✓ |
| 7 | Member login | ✓ | ✓ | ✓ |
| 8 | Feedback | ✓ | ✓ | ✓ |
| 9 | Library statistics | ✓ | ✓ | ✓ |
| 10 | Member account details | ✓ | ✓ | ✓ |
| 11 | User help | ✓ | ✓ | **X** |
| 12 | Reservation through OPAC | ✓ | ✓ | **X** |
| 13 | Web OPAC | ✓ | ✓ | ✓ |
| 14 | Generation of accession register | **X** | ✓ | ✓ |
| Note: **Availability (✓) and non-availability (X) of element/item** | | | | |

Koha has very good web interface where as Newgenlib has an expert search interface and e-Granthalaya has browsing of items by a-z. Normal search facility is available in all the three software's but guided search is possible in Koha. Library statistics and Member login is possible in all the three ILMS and status of the items are also possible. User help and Reservation items is possible in Koha and Newgenlib and it is not possible in e-Granthalaya. Lists and cart/book bag which allows adding titles lists to cart is the feature of Koha only. Koha provides purchase suggestions but it is not possible in Newgenlib and e-Granthalaya. It is clearly found that Koha has more advanced options and user friendly web interface than Newgenlib and e-Granthalaya.

**Table 10: Reporting functions**

| Sl. No. | Reporting functions | Koha | Newgenlib | e-Granthalaya |
|---|---|---|---|---|
| **1** | View Index | ✓ | ✓ | ✓ |
| **2** | Catalog Queries | ✓ | ✓ | ✓ |
| **3** | Acquisition queries | ✓ | ✓ | ✓ |
| **4** | Approval Queries | ✓ | ✓ | ✓ |
| **5** | Order Queries | ✓ | ✓ | ✓ |
| **6** | Vendor Queries | ✓ | ✓ | ✓ |
| **7** | Invoice queries | ✓ | ✓ | ✓ |
| **8** | Holding Search | ✓ | ✓ | ✓ |
| **9** | Accession Register | **X** | ✓ | ✓ |
| **10** | Patron Statistics | ✓ | ✓ | ✓ |
| **11** | Circulation statistics | ✓ | ✓ | ✓ |
| **12** | Most issued Books | ✓ | ✓ | ✓ |
| Note: **Availability (✓) and non-availability (X) of element/item** | | | | |

Reports are very important to take statistics of library to know the performance of the library. Table 10 shows the reporting functions of the three ILMS. Koha has the integrated report facility but Newgenlib has the pulgin for the reports generation and e-Granthalaya has crystal reporting facility. Catalog, acquisition, approval, order, vendor and invoice queries are available in all the three ILMS. Accession register generation facility is available in Newgenlib and e-Granthalaya but it is lacked in Koha. Form the above findings it shows that Newgenlib has better report generation facility than Koha and e-Granthalaya.

**Table 11: Help and update functions**

| Sl. No. | Help and update functions | Koha | Newgenlib | e-Granthalaya |
|---|---|---|---|---|
| 1 | Discussion forums/mailing lists | ✓ | ✓ | ✓ |
| 2 | FAQ | ✓ | ✓ | **X** |
| 3 | Feature request system | ✓ | ✓ | ✓ |
| 4 | Help desk support (Paid/Free) | ✓ | ✓ | ✓ |
| 5 | News/Events | ✓ | ✓ | ✓ |
| 6 | Upgrades | ✓ | ✓ | ✓ |
| 7 | Training | **X** | ✓ | ✓ |
| 8 | Commercial support | ✓ | ✓ | ✓ |
| 9 | E-mail | ✓ | ✓ | ✓ |
| 10 | Updates of version | ✓ | ✓ | ✓ |
| 11 | Manuals of Installation and software use | ✓ | ✓ | ✓ |
| 12 | Request form | ✓ | ✓ | ✓ |
| 13 | Backup | ✓ | ✓ | ✓ |
| 14 | Multi user | ✓ | ✓ | ✓ |
| 15 | Data migration | ✓ | ✓ | ✓ |
| 16 | Barcodes generation | ✓ | ✓ | ✓ |
| Note: **Availability (✓) and non-availability (X) of element/item** | | | | |

Before adopting any ILMS, it is very important to know that what kind of help, user support and updates are available for particular ILMS. Table 11 reveals the Help and update function of the three ILMS. In all the three ILMS, there are many features are common and some of features are present in one software and it is absent in other software. Discussion forums/mailing lists, Feature request system, Paid service, Upgrades other features are common in all the three ILMS but FAQ are not present in e-

Granthalaya and Koha has not providing training. Further Wikis, twitter, RSS and social networking is available in Koha and Newgenlib and it lacks in e-Granthalaya. This shows that Newgenlib is more technology oriented and compliant of library standards and developed as per the present client requirements.

## CONCLUSIONS:

Library automation is a necessary process for any kind of library to deliver the services to the users in right time at a faster mode to save the user's time. The analysis of Koha, Newgenlib and e-Granthalaya are the web enabled FOSS software's for library automation. The study is reported the all most all features of the ILMS, each and every software has its own design and architecture. Newgenlib has more features than Koha and e-Granthalaya. The Koha has built on open source technologies and it is easy to install and use. The e-Granthalaya has simple and useful software for small and medium sized libraries and it is not built on library standards and it has to be improved more and more. Newgenlib and Koha more enhanced features which are significant for selecting ILMS for automation. Overall Newgenlib has advanced and more features than other two and which can select has ILMS for automation according to their needs.

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