Smart Usage of Koha: An Open-Source Library Management System

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Abstract: Academic libraries are leaning toward Koha and other affordable automation technologies in order to meet international standards and stay competitive in the modern knowledge society. Over 15,000+ libraries worldwide utilize the first open-source library management system, Koha. While managing library resources with automation is important, enhancing user involvement, engagement, and cooperation in libraries is one of the biggest issues facing information professionals. This study makes an effort to pinpoint elements or methods that influence Koha's SMART usage through a successful strategy that can also improve the environment of a library. Koha not only helps in developing ICT Skills in library professionals but also helps to develop collaboration between library staff and library users. Such collaborative educational technology platform encourages knowledge sharing and its facilitation in cost-effective way. The paper also discusses how to customize Koha, add Koha plugins, and use Koha to access social media, all of which will help any library to become TECHNO SMARTER. The SMART usage of Koha ILS (Integrated Library System) is important because it helps libraries to effectively manage their resources and provide better services to their patrons. Koha provides a centralized database to manage the library's collections, including books, periodicals, and other resources. This helps the library to keep track of its holdings and ensures that resources are properly cataloged, classified, and shelved. It provides a user-friendly interface that makes it easy for patrons to search for and access library resources. The system also integrates with other systems, such as online catalogs and digital collections, to provide a seamless experience for users. Koha automates many of the routine tasks associated with library management, such as circulation, check-ins and check-outs, and fines. This helps to reduce manual errors and increase efficiency. Koha provides a wealth of data that can be used to inform decision-making and evaluate the effectiveness of library programs and services. The system generates reports and data analytics that can be used to identify trends, track usage, and measure the impact of library initiatives. Koha is an open-source solution, which means that libraries can save money on licensing fees compared to proprietary systems. The system can also be customized to meet the specific needs of each library, further reducing costs. The SMART usage of Koha ILS provides a range of benefits to libraries, including improved resource management, enhanced user experience, increased efficiency, better data analytics, and cost savings.

Keywords: Koha, Library Management System, Library Technology, Key Competence for LIS Professionals, ILS, Library Automation

1. Introduction

Working with older LMSs (Library Management Systems) can be difficult for librarians because of their rigidity and restricted functionality. The fundamentals of transitioning to any library management software include understanding data

migration, system analysis, system requirements, mapping with MARC21 formats, database construction, and backup procedures. To fully utilize Koha's features, library professionals must become knowledgeable in these particular areas in order to use it effectively.

Open-Source Software (OSS) enables users to contribute to, use, and improve the technology. Software that is available under an open-source license has a lot of positive effects. The fact that OSS may be set up without cost is a huge benefit. Users are able to participate, use the technology, and make improvements at the same time. It is necessary to consider open-source library software as a potential choice because it is available and has options for various platforms. Open source is a big deal since it enables the user to inspect the program's internal logic in detail. Making a product for the open-source market would be a way to give back to society and empower it to create potentially fantastic things.

1.1. Need of Open-Source Software

A good open-source project that overcomes a common problem has the genuinely extraordinary property of gaining its momentum and being sustained for a considerable amount of time by a positive cycle of continual development. Writing good code from the start would be the solution in the case of proprietary code, and in the case of open-source usage, picking good components early on would be the solution in the case of having to fix someone else's code. To learn more about how programming functions, we can examine and understand source code. For the receiving party to enhance or modify the code, the source code must also be made available. One of the main drivers of widespread programming innovation is open-source code. Because of the improved control, stability, and security that open-source programming offers, many people also prefer it. To connect or participate fully in the community that is at the heart of open-source initiatives, information professionals need to develop new skills.

Open-Source Software is freely available to users and allows them to modify the source code under the terms of a license. The user can modify the source code, customize the software, and redistribute it in either modified or unmodified form. Libraries were early adopters and innovators of open source [1].

Open-source software can be a valuable asset for academic libraries for several reasons:

1) Cost savings: Open-source software is usually free, which can result in significant cost savings for academic libraries, especially those with limited budgets.
2) Flexibility: Open-source software allows libraries to modify and tailor the software to meet their specific needs, making it more adaptable to the library's changing requirements.
3) Collaboration: The open-source nature of the software encourages collaboration and sharing between libraries, which can lead to the development of new and improved features.
4) Security: Open-source software often receives regular security updates and patches, which can help to reduce the risk of data breaches and other security incidents.
5) Support: Open-source software has a large user community, which can provide support and troubleshooting assistance.
6) Integration: Open-source software can be integrated with other open-source tools and systems, providing greater flexibility and versatility for libraries.
7) Innovation: Open-source software fosters innovation and creativity, as users are free to modify and enhance the software to meet their specific needs.

1.2. Review of Literature

Koha is a helpful package for building a database for information retrieval. It is meeting the ever-increasing needs and expectations of library professionals, posing a serious challenge to automation software vendors. Almost all library software provide the same module for all types of libraries, ignoring aspects such as library collection, user, and services, whereas open source ILs software includes core functional modules such as online catalogue, circulation, and cataloguing with a limited parameter format choice. The open-source model of ILS software, such as Koha, can be an appealing alternative for libraries. Without a doubt, Koha, the open-source software (OSS), has a number of advantages over other available open source solutions in a variety of ways [2].

The Koha library software proved to be an excellent tool for achieving maximum library effectiveness at the lowest possible cost. The automation of the UGL benefited both staff and users by reducing staff job stress and improving remote and timely provision of up-to-date information to users. With the introduction and development of OSS, the transition from "traditional" to "technology-based" library services has become more efficient and cost effective. As a result of the potential benefits that OSS provides, it is expected that other libraries in Guyana will join the Koha network [3].

In Zambian higher education institutions (HEIs), Koha is the most widely used free and open-source library management system (FOSLMS). Koha is widely used in HEI libraries because it is free and open-source. Many libraries in Zambian HEIs face difficulties when using Koha. These difficulties include difficulties using some modules due to Koha's complexity. Other issues encountered include a lack of technical support, unreliable Internet connectivity, and difficulties upgrading and backing up the Koha database. It has also been established that there is no relationship between receiving Koha training, respondents' LIS qualification, and experiencing difficulties with Koha [4].

Koha is a useful package for database creation and information retrieval. However, the ever-increasing needs and expectations of library professionals have created a challenge for automation software vendors. Almost all ILs software provides the same module for all types of libraries, ignoring aspects such as library collection, user, and services,

but open-source ILs software includes core functional modules such as online catalogue, circulation, and cataloguing with a choice of limiting parameters format. The University Library's daily operations have been automated using the Koha open source software system, which has shown to be more effective for automating libraries. If only its ideals could be realized and things could change very quickly, the open source model of ILS software like Koha could offer libraries a compelling substitute. to assess the features, reliability, support, and vision of both commercial and Koha open source ILs software [5].

The majority of libraries and library professionals are enthusiastic about adopting Koha. Koha also includes Web 2.0 features such as tagging, comments, social sharing, and RSS feeds. Because of its web-based architecture, Unicode compatibility, user-friendliness, and extensive customization options, Koha software is gaining popularity. This situation necessitates the need for library professionals to attend workshops, and seminars, and receive technical assistance in order to successfully implement Koha. Because of its active user community, Koha is relatively more popular in India. Because of its ability to handle Indian languages, Koha has been used in many prestigious library automation projects in India. Only a few commercial library system vendors in India provide advanced systems and services, but the systems are very expensive. It usually costs more than the annual budget of a mid-sized library [6].

Researcher found that users preferred round-the-clock access to the OPAC, book check-out, and book check-in systems, while online purchase suggestions, receipt printing, and book reservation systems were the least perceived means of meeting the need. The overall satisfaction of library users with Koha software ensured positive appreciation, and their level of satisfaction was reasonably high. As a result, Koha is performing well in Bangladeshi private university libraries. The level of satisfaction of library users with Koha was significantly different between students and teachers in Bangladeshi private university libraries, indicating that students were significantly less satisfied with the services provided by Koha [7].

It was observed that implementing Koha software to drive library operations will improve library services with reduced effort and enhanced service delivery in North Central Nigerian public university libraries [8].

1.3. Objectives of the Study

1) To encourage the use of an open-source library management tool software and its simple implementation
2) To lower the cost of the infrastructure for library automation
3) To encourage the use of library web services and information portals
4) To encourage anytime, everywhere access to library resources
5) To talk about suggestions for using Koha
6) To discuss the Koha software's modification customization options
7) To ease the library staff's aggravation and stress, especially in the transition phase of Koha
8) Libraries are given suggestions on how to exercise control of Koha system implementations

2. Methodology

For the current study critical a literature review on Koha ILS has been done which typically involves the following steps:

1) Searching for relevant sources: This involves searching for peer-reviewed articles, conference papers, and other relevant sources in databases such as Scopus, JSTOR, Google Scholar, and others, using keywords related to Koha ILS.
2) Selecting sources: After conducting the search, the researcher has selected the most relevant sources. This selection is usually based on the relevance of the source to the research question and the quality of the source.
3) Reading and analyzing the sources: This involves reading and thoroughly analyzing each selected source to gain an understanding of the existing knowledge on Koha ILS. This includes identifying themes, trends, and gaps in the literature.
4) Synthesizing the information: This involves organizing and summarizing the information gathered from the sources into a coherent and comprehensive overview of the existing knowledge on Koha ILS.
5) Evaluating the quality of the sources: The researcher had critically evaluated the quality of the sources by considering factors such as the methodology used, the sample size, the results obtained, and the conclusions drawn.
6) Drawing conclusions: Based on the synthesis of the information, the researcher has drawn conclusions about the current state of knowledge on Koha ILS.

3. Initiative to Strengthen Digital Libraries Through Smart Koha

OSS is becoming increasingly widespread in libraries nowadays, owing to its economic benefits. And one of them, Koha, has sparked considerable attention. It is designed to function with minimal hardware resources, is a well-established ILMS, and is now used by research, academic, and special libraries. Koha is a platform-independent solution that can be quickly incorporated, allowing for seamless library transactions. Koha is designed to function with minimal hardware resources. Koha is now used in almost every part of the world. Koha has an abundance of illustration and preparing materials to help librarians consistently coordinate this new framework into their current systems.

Koha is the first of its kind, an open-source integrated library software (ILS) used by all types of libraries

worldwide, including public, school, and special libraries. Its growth and development are guided by a nurturing community of libraries and users worldwide who work together to achieve its technological objectives and goals [9].

Koha includes the majority of the features that would be anticipated in an ILS, which may be stated as follows:

1) Web-based ILS with SQL database and easy user interface
2) Increased self-service transaction rate
3) No OS reliance (i.e. Linux, UNIX, Mac, etc.)
4) No upgrade or scaling charges for more module's users
5) No extra separate additional module charges
6) No vendor dependency
7) Anytime, everywhere virtual access to the library's online catalogue
8) Online and "Offline" circulation
9) Customizable search - popularity, author, call number, dates, and title
10) Integration with library or organization's website
11) Single host server for multiple libraries
12) Email/text notifications to users
13) Union cataloguing, serial management, and bar code printing
14) International cataloguing standards include MARC21, UNIMARC, Unicode, Z39.50, and ILL.
15) RFID Technology compatibility
16) Provides customization that meets library needs
17) Interactive support is offered via the developer's collaborative environment

3.1. How to Use Koha Smartly

In the case of civil work in the library, management is in charge of library upkeep. Industrial automation systems are expensive, and numerous libraries would like to avoid the upfront purchase costs and ongoing maintenance fees which are associated with them. The automatic collection of information will make library management easier. Inventory management in real-time is still a relatively unknown product. It is quite simple to handle with the help of an authentic time inventory management solution. Before selecting the best ILS for a library, one must test the system and conduct significant research. Preparing a professional asset management method is actually rather straightforward. When selecting an ILS, libraries should not overlook open-source solutions. Successful methodology will assist with executing and organization of library, so we should comprehend how to utilize KOHA smartly.

3.2. Technical Features of Koha

Koha is an open-source integrated library system (ILS) that offers the following technical features:

1) Cataloging: Koha supports various cataloging standards such as MARC21, UNIMARC, and Dublin Core.
2) Circulation: Koha offers robust circulation management features, including check-in, check-out,

holds, and overdue.
3) Acquisitions: Koha provides tools for ordering, receiving, and invoicing materials, as well as managing budgets and vendors.
4) Serials management: Koha has features for managing serial subscriptions, including claims and routing lists.
5) Patrons' management: Koha allows librarians to manage patron information, including borrowing privileges and fines.
6) Reporting: Koha provides a range of reports and statistics, including circulation, acquisition, and cataloging data.
7) OPAC: Koha's online public access catalog (OPAC) allows patrons to search the library's collections and access their account information.
8) Z39.50 support: Koha supports the Z39.50 protocol for searching and retrieving information from other library catalogs.
9) Customization: Koha can be customized through its user-friendly administration interface, as well as through the use of plugins and templates.
10) Multi-language support: Koha supports multiple languages, allowing libraries to serve a diverse user base.

3.3. Comparison of Koha with Other ILS

Koha is an open-source integrated library system (ILS) that is often compared to other ILS solutions, such as:

1) Evergreen: Evergreen is another open-source ILS that is widely used in public and academic libraries. Like Koha, Evergreen offers a range of features for circulation, cataloging, and reporting, and has a large user community for support and customization.
2) Sierra: Sierra is a proprietary ILS developed by Innovative Interfaces, Inc. It is widely used in academic and public libraries, and offers a comprehensive range of features for circulation, cataloging, and reporting. However, it is more expensive than open-source alternatives like Koha and Evergreen.
3) Alma: Alma is a cloud-based ILS developed by Ex Libris. It is primarily aimed at academic libraries, and offers a range of features for resource management, patron management, and analytics. Unlike Koha and Evergreen, Alma is a proprietary software and is more expensive.
4) Symphony: Symphony is a proprietary ILS developed by SirsiDynix. It is widely used in public libraries, and offers a range of features for circulation, cataloging, and reporting. Like Alma, it is more expensive than open-source alternatives like Koha and Evergreen.

In contrast to NewGenLib and Virtua, Koha is more transparent and offers its clients unrestricted use of the software, whereas Libsys only permits restricted use. While NewGenLib only offers binaries for customization, Koha offers its source code for configuration and personalization. Around the world, there are more active community involvements in Koha and NewGenLib development and

interaction. In contrast to Libsys and Virtua, their user communities are sufficiently involved. The common characteristics that can be found in all of the ILMSs under study include compatibility with international metadata, interoperability standards, and standards requirements of the client library. Compared to NewGenLib, Libsys, and Virtua, Koha is more adaptable. In accordance with the needs of the library and its users, Koha and NewGenLib are modified and expanded. Because the system-supplying commercial agency protects the source code, this feature is not present in Libsys and Virtua [10].

3.4. Koha Installation and Understanding Koha Specifications / Preferences

Although Koha may be installed on a local server, we are concerned about data security and stability. The best solution will be a Linux cloud server. It will decrease both physical server maintenance and database backup difficulties. When installing Koha, the librarian should ensure that the re-indexing option is enabled. Re-indexing will assist in automatically updating the database at certain time intervals.

Understanding a system requirements specification may appear to be a daunting task, but there are ways to make it easier on ourselves. It will create a roadmap for the team and reduce the likelihood of failure after launch. You now understand how to write an excellent system requirements specification for your project. Right from the outset of a project, requirements engineering may assist us in analyzing and defining all essential needs. It is a process of gathering and specifying what services the system should give. It is defined as the process of developing, documenting, and managing software requirements by Wikipedia. LMAP is the recommended internet server solution for Koha from a server standpoint (i.e. Linux, Apache, MySQL and Perl). However, from the perspective of the end user, the user should have adequate internet connectivity and preferable web browsers such as Google Chrome or Mozilla Firefox. Librarians should also keep in mind that when adding user images to Koha, they should only be in JPEG/PNG/GIF format (i.e. strictly no BMP format).

3.5. Data Transfer and Types of Data Can Be Imported into Koha

If not planned carefully, data migration will be a challenging procedure for libraries. Finding a professional ILMS vendor, validating the vendor's reputation online and offline, manual data re-entry, information mapping using MARC21 format, and staff worries about learning new ILMS will all be time-consuming chores. One of the finest places to look for professional vendors is on the Koha community website. Discussing existing library needs as well as difficulties with present LMS software with a new Koha ILMS provider would undoubtedly help to minimize frustration and improve efficiency with Koha. Librarians should verify that their existing LMS software is capable of exporting reports, particularly in comma-separated values

(CSV) or Microsoft Excel (.xls) formats, so that data may be readily converted to Koha rather than re-entry. Importing cataloguing data, transaction data, circulation data, and user data is all possible with Koha. Following data transfer, librarians should confirm that migrated data is clearly and accurately displayed in Koha by validating reports, searching book information in the catalogue, user information in the patron area, and vendor information in the acquisition portion of the Koha ILMS. Before migrating cataloguing information, library resource types such as books, reference books, journals, CDs/DVDs, and so on should be precisely recognized in order to produce accurate item types in Koha and appropriately map with its data. In the lack of Unicode formats that consistently encode, process, and portray information, multilingual information mapping can be rather challenging.

Only MARC bibliographic data can be imported into Koha. A popular MARC editing utility tool called "MarcEdit" was used to convert the exported file from Alice for Windows into a Koha-compatible file. This free and comprehensive MARC editing utility tool allows you to quickly and easily edit MARC format records in batches or individually [11].

Before importing data into Koha, it should be mapped according to the MARC 21 Bibliographic format. As a Koha system administrator, a librarian can use the Tools Module in Koha to map and import patron data, patron photos, MARC entries, and circulation history. Data mapping will be simple with Microsoft Excel since we can generate several output files. We must convert the patron's mapping excel file into .CSV format, as well as the MARC record file (i.e., books) into. MRC format. When we import data into Koha, it will notify us about particular problems such as user duplication or incorrect date format, for example.

3.6. Koha Administration and Configuration

Because Koha is a web application, we require an internet server. It is a powerful tool for managing libraries, and it is not easy to get started since we must deal with themes such as MARC 21 and a plethora of other bibliographic issues in order to properly install Koha. As a result, it cautions of the issue in current versions. The Administration module in Koha determines how our entire library should function. Because this module serves as the heart of the Koha system, it must be configured with proper values and fields. Librarians, as Koha system administrators, should describe
1) The library and its several branches (i.e. if required).
2) Students, research scholars, faculty, and library personnel are examples of library users.
3) Users are granted administrative rights such as circulation, patron addition, serials administration, cataloguing, and so on.
4) Books, Donated Books, Thesis, Audio, Reference books, Journals, Book Bank, and so on are examples of library resources.
5) Fine rules and Circulation rules
6) Control Koha plugins

7) MARC bibliographic framework creation and management
8) Sources of classification for collecting
9) Currency, budgets, and funds are examples of acquisition factors

3.7. Koha Cataloging, Generating Barcodes or Spine Labels

Before we begin cataloguing in Koha, we'll probably want to conduct some basic setup. Because of the setting in your Biblio Adds Authorities system choices, certain fields may not be editable. Before exporting our records, we should evaluate our export tables to confirm which fields we want and which we don't. We won't be able to change or remove fields and subfields once we're in the cataloguing module, so our frameworks must be ready before we begin cataloguing. Following data migration, the library staff should check that all data is accurately mapped and displayed in the appropriate bibliographic field. We may also make use of Koha's copy cataloguing capability. Bibliographic information of library resources may be readily copied and saved to Koha with appropriate accession numbers using Z39.50 search in cataloguing module. This capability, which is available with the LIBRARY OF CONGRESS, is more beneficial for cataloguing information searches.

As soon as Koha cataloguing is finished, books must be barcoded. Koha may be customized to work with a variety of printers, preferably an A4 printer or a zebra thermal printer. Liberians should first establish the barcode template layout, taking into account the bibliographic data that will be printed on it, such as title, author, ISBN, ISSN, barcode, typeface, and alignment. We can obtain barcodes in a variety of file formats, including PDF, CSV, and .XML.

3.8. Offline Circulation Utility

Circulation is an important activity in libraries, and because Koha is a web service, it can only be done online. Library circulation is frequently disrupted owing to disruptions in internet access. This scenario is regularly encountered in numerous rural libraries. To address this issue, the library team could use Koha's "Offline Circulation" option. However, it should only be utilized when there is no internet access. The library crew can use this program to issue or return books while Koha records these transactions in real-time. The librarian should guarantee that while using this software, the transaction file is saved and uploaded as soon as an internet connection is available. We can simply trace the user's trip alongside the book. It is also possible to obtain circulation records by user categories (i.e. patron), such as faculty members, research students, managers or scientists, engineers, and so on.

3.9. Koha Plugins

Koha library services may be enhanced with a variety of plugins or tools. ERP, user activity management tools (library monitoring system), attendance systems, mobile apps, information kiosks, and RFID devices for self-service and security services may all be integrated into the Koha web applications. Customization is also possible with Koha reports, which may be prepared in graphical/visual formats for simple interpretation utilizing the report utility. Library patrons can also benefit from SMS alert services for all transactions. SMS gateway integration with Koha software is required for this reason, as is the requirement of today's information society. These SMS messaging formats can also be altered and utilized for specific transactions. Koha fits with and supports the "Learning Commons" principle of providing access to the most up-to-date information in a variety of formats. The Koha Mobile app provides rapid access to vital information. On the Android Play store, we can discover Koha apps with useful functions such as user profiles, catalogue searching, history, penalties, and transaction alerts. These sorts of adaptations and enhancements will undoubtedly aid libraries in reaching the unreachable. The responsive feature of these mobile apps will encourage readers and library personnel to collaborate.

3.10. Handling the Reports

The Koha reporting module includes powerful wizards for cataloguing, patrons, circulations, and acquisition. Each wizard provides us with statistical information about these segments. These data are current and provide accurate information about the function of the library. It also provides current serial circulation status, statistical data on lost items, average loan time of checked out items, and so on [12].

Koha offers a variety of reports to help libraries track and analyze their collections, circulation, and patron data. Some of the types of reports available in Koha include:

1) Circulation reports: These reports provide data on check-outs, check-ins, holds, overdue, and other circulation-related data.
2) Acquisitions reports: These reports provide information on the library's purchasing and invoicing activities, including vendor and budget data.
3) Cataloging reports: These reports provide information on the library's cataloging activities, including bibliographic data and holdings information.
4) Patron reports: These reports provide information on the library's patrons, including borrowing history, fines, and other account-related data.
5) Serial reports: These reports provide information on the library's serial subscriptions, including claims and routing lists.
6) OPAC usage reports: These reports provide information on the usage of the library's online public access catalog (OPAC), including search terms and patron activity.
7) Statistical reports: These reports provide a wide range of statistical data on the library's collections, circulation, and patron activity.
8) Custom reports: Koha allows users to create custom reports to meet their specific needs and requirements.

The library staff is frequently required to deal with numerous reports, which may be simply created using Koha.

Popular reports include Accession Register, Patron Data, Transaction Count, Monthly Circulation, Books Issued Not Returned, Transaction Count, Over Due, Item Status, Unique Title Details, and more. We can produce about 3000 different sorts of reports with Koha. The Guided Reports Wizard in Koha allows librarians to build or customize these sorts of reports. These reports can be exported to a variety of formats, including CSV, PDF, and HTML, and can be used to track the library's performance, identify trends, and make informed decisions [13-15].

The migration to the OSS Koha does not require the hiring of external commercial support. Instead of having a deep understanding of computers and programming languages, the entire process needs to be tested and used with tips and tricks. It also shows that open-source tools and technology, which only need to be discovered, which are having the answers to the majority of problems. Without spending a dime on the adoption of the new ILMS Koha, Koha significantly increased user-based online services along with web 2.0-based services while reducing the efforts of staff in routine library tasks [16].

4. Conclusion

Open-source software can offer academic libraries a cost-effective, flexible, and secure alternative to proprietary software, and can help them to meet their specific needs and goals. To create an automated library system, one must first test it, acquire an overall look and feel for the system, and do considerable study before deciding on the ideal automation method. Information workers must learn new skills in order to effectively participate in the community that is at the heart of open-source initiatives. Next-generation librarians are keen to learn about library technology. Given the current situation, it is reasonable to conclude that an open-source automation tool such as Koha has the potential to provide a stable and smart choice for the smooth operation of libraries if significant contributions were made during Koha implementation and administration by trained human resources. Koha enables complete customization and charging of library data for a fraction of the cost of a proprietary solution. Obviously, with the new capacities, Koha gives plenty of illustration and reference materials to help library professionals flawlessly coordinate this new framework into their current library management system. Koha also makes it easy for libraries to migrate because it is a genuinely platform-independent solution that can be implemented immediately. There are several wonderful options for improving teaching and learning while using Koha OSS Technology that should not be overlooked. Thus, Koha may be a competent, cost-effective, and productive option for libraries, which account for a significant share of the world's knowledge-driven economies. Ultimately, the choice of ILS will depend on a library's specific needs and goals, and factors such as budget, user community, and customization options should be considered.

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