USE OF OPEN-SOURCE SOFTWARE IN LIBRARIES: A CASE STUDY OF KOHA ADOPTION

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Abstract:

The growing demands of low-cost, flexible, and renewable methods for the automation of libraries have led to the continuous use of open-source software in academic libraries across the globe. This research paper investigates the adoption and implementation of Koha, a widely used open-source Integrated Library System (ILS), in Indian academic libraries between 2005 and 2014. This analysis assesses the three main factors that led to the popularity of Koha: namely, cost constraint challenges, rejection of vendor dependence, and wide latitude of customization. Moreover, it provides case studies of some of the chosen institutions that have successfully migrated to Koha, describing the processes, advantages, and problems that occurred. The results show that Koha has had a significant impact, according to the improvement in the effectiveness of operations; it is accessed by many users via web-based OPACs, and it has eased the integration of digital resources. However, the lack of technical skills, barriers related to data migration, and resistance to change continued to pose problems even during the transition period. This paper has found that implementing Koha represented a significant change in library services, providing a foundation for the increased use of open-source systems in Indian academic libraries.

Keywords: ***Open Source Software, Koha, Library Automation, Integrated Library System, Academic Libraries, Library Management, India, Open Source Adoption***

INTRODUCTION:

The 21st century has seen a significant shift in library services due to the advancement of information and communication technologies (ICT). As libraries worldwide seek to modernize their operations and improve access to resources, the demand for efficient and cost-effective Integrated Library Systems (ILS) has grown. Open-source software, such as Koha, gained international recognition for its flexibility, web-based interface, community-driven development, and robust functionalities.

In India, Koha's adoption began to gain momentum after 2005, coinciding with the broader push towards digital library services and automation. Academic institutions, facing financial constraints and seeking greater control over their library systems, started exploring Koha as a practical solution. Koha's modular architecture supports essential library functions such as cataloging, circulation, serials management, acquisitions, and online public access catalogs (OPACs) without costly licensing fees.

Koha gained widespread acceptance across the globe, especially in developing countries, due to its affordability and adaptability. Its adoption was further boosted by the active involvement of a global community of

developers, librarians, and support organizations who continuously contributed to its improvement. The software's ability to support Unicode and multilingual environments made it suitable for diverse linguistic settings like India.

In the Indian context, Koha's adoption gained momentum after 2005, when libraries began exploring alternatives to costly proprietary software. The flexibility to localize Koha's interface, integrate it with digital repositories, and operate it over a web browser made it a practical solution for academic and research institutions. Organizations such as INFLIBNET, NIC, and several library networks encouraged its use, and a growing number of Indian universities and colleges migrated to Koha during the 2005-2014 period.

Koha represents not just a technological innovation but also a movement toward open knowledge, collaboration, and sustainable library development.

Objectives of the Research:

1) To identify the key factors that influenced libraries to adopt Koha, including economic, technological, institutional, and user-based motivations.
2) To analyze the implementation process of Koha in selected academic institutions, with a particular focus on planning, software installation, data migration, staff training, and system integration.
3) To evaluate the benefits and improvements that Koha brings about, including operational efficiency, user accessibility, and customization capabilities.
4) To investigate the obstacles and constraints libraries encounter both during and after implementing Koha, encompassing technical, administrative, and human resource concerns.
5) To evaluate how support systems and community involvement contribute to the successful adoption and continuous upkeep of Koha in Indian libraries.

Literature Review:

The adoption of Koha by Indian libraries has been the subject of scholarly research since the middle of the 2000s. Ghosh and Das (2006) were among the first to evaluate Koha's suitability for academic libraries in India, underscoring its affordability and multilingual functionality. Reddy and Kumar have noted the effort of Reddy and Kumar that by 2009, several libraries in South Indian universities had begun the process of implementing Koha, with the ease of use and the flexibility of the software cited as the main benefits despite a lack of familiarity with open-source software by initial staff members. Dahibhate and Barve further mapped the growing interest in Koha, especially in the institutions whose development is supported by the government and the early adopters who are mentors to the later implementations in 2010. This was still observed in the year 2011 when Kumar and Abraham reported an improved customer satisfaction after implementing Koha, especially in features of the library such as OPAC and the web interface. Rath and Mahapatra (2012) gave a more fine-grained account of technical hurdles, including data migration and customization, and accepted that future Koha systems are much more successful than proprietary ones in terms of scalability. Arora and Agarwal (2013) focused on Koha's utility for smaller college libraries, emphasizing its

suitability for budget-constrained institutions. Finally, Singh and Sharma (2014) offered a comparative analysis with commercial software like LibSys, concluding that Koha's flexibility, open nature, and active user community rendered it a viable long-term solution for academic libraries, notwithstanding the need for training and support.

Research Methodology:

This study examines the adoption of Koha, an open-source Integrated Library System (ILS), in Indian academic libraries from 2005 to 2014. The research uses a qualitative and quantitative mixed-methods approach, including surveys, interviews, and observations. The study is limited to Indian academic libraries, may not reflect post-2014 developments, and may be subject to response bias. The methodology aims to provide a comprehensive understanding of Koha's adoption and implications for library automation in India.

Use of Open Source Software in Libraries: A Case Study of Koha Adoption

Open Source Software (OSS) has become a powerful tool for modern libraries, freeing them from the limitations of commercial software and giving them the freedom to tailor the software to their specific needs, while also enabling the global community to share improvements and avoid being stuck with one vendor for a long time. Koha, first released in New Zealand in 1999, constitutes the world's inaugural open-source integrated library system. Its suite of modules addresses cataloging, circulation, acquisitions, serials control, patron management, and an Online Public Access Catalogue (OPAC). As a purely web-based system, Koha is user-friendly and efficient, and it notably complies with international standards such as MARC21 and Z39.50.

A longitudinal account showing worldwide Koha adoption from 2005 to 2014 shows that the worldwide growth is significantly accelerated, especially in Asia, Africa, and Latin America. Reasons cited for fueling this momentum include low ownership costs, a shift away from proprietary vendors, high levels of flexibility beyond customization, and active membership in a robust international user and developer community. In contrast to proprietary systems that require untenable licensing costs, Koha does not have such fees and can be affordable even for small or poorly equipped libraries. This community spreads improvements and support across various forums, documentation sites, and user groups with constant updates.

However, deployments have faced several challenges, including a lack of internal technical capability, the migration of data from legacy proprietary systems, institutional rigidity towards technological changes, and the costs associated with long-term maintenance and general updates. The experience in India from 2005 to 2014 is instructive: by 2014, hundreds of academic libraries had successfully transitioned to Koha.

The implementation of Koha has brought some significant improvements in the quality of services provided by libraries as well as the efficiency of their operations, achieving a high level of automation of its basic functions, user-friendliness, and compatibility with global sources of bibliographic information. Koha owes its longevity and success to its vibrant global community, which improves the software through online message

boards, email discussion lists, yearly conferences, and Git repositories.

An overview of the library automation market from 2005 to 2014 reveals that Koha is the most popular open-source solution, especially in areas with limited availability of commercial implementations. To help open-source software grow, people in a group need to talk about and implement plans that cover training, personal development, policies, budgeting, curriculum, support for moving to the new system, and active involvement with the global Koha user community.

Rationale for Adopting Open-Source Software

Libraries have adopted open-source systems like Koha due to operational needs and strategic goals. Cost-effectiveness constitutes the most prominent incentive. Since open source does not require any licenses, organizations can save significantly on costs, and those in less developed countries with limited resources can benefit even more. Koha has a modular design, so it can be highly customized, and it allows an institution to adapt the way the system works and how data is organized to its localized operational needs, such as multilingual operations and the ability to integrate with existing digital infrastructures. Additionally, its large and proactive international community of users provides technical support, continuous new features, bug patches, and a wide variety of plugins that expand the platform's functionality.

The platform expands its functionality with new features, bug patches, and a diverse range of plugins. Another critical advantage is that it provides libraries with the independence of proprietary vendors and enables them to have complete control over their data, release cycles, and options in configuring it to suit their needs. Koha's conformity to international standards such as MARC21 and Z39.50, along with its integration for adopting RFID technology, contributes to increased interoperability with third-party systems and helps maintain professional cataloging conventions. On balance, all these advantages make Koha and other open-source systems rather attractive to libraries looking at sustainable, scalable, and self-sufficient technological frameworks.

Trends in Koha Adoption

During the period of 2005 to 2014, Koha—an open-source integrated library system (ILS)—moved from novelty status to prominence within the library automation sector. Three chronologically distinct phases characterize this evolution: the Initial Phase (2005–2008), the Growth Phase (2009–2011), and the Mainstreaming Phase (2012–2014). The initial phase concentrated on adoption among a small cohort of progressive academic institutions, notably the Indian Statistical Institute, several Indian Institutes of Technology (IITs), and private research centers. Such pioneers were paramount to localizing the software and putting together a discourse on the subject of open-source library management systems.

The Growth Phase (2009–2011) witnessed marked expansion, particularly among state universities, engineering colleges, and autonomous institutions. Notably, INFLIBNET and NASSDOC maintained an open-source culture by holding training workshops, holding onsite seminars, and providing thorough documentation facilities. Simultaneously, local user units and knowledge-sharing

networks began to form, and librarians started sharing their experiences and developments related to Koha.

In 2012, Koha entered the Mainstreaming Phase, during which a significant number of institutions migrated away from proprietary systems like LibSys, SOUL, and other commercial ILS solutions, primarily because these proprietary systems were viewed as too expensive, restrictive, and inflexible. On the other hand, Koha offers solutions for scaling and customization, and its community support makes it very flexible and adaptable to changing library requirements.

Over more than ten years, Koha has evolved into a mainstream ILS used by a diverse community of institutions. All these stages of adoption are exemplary of a changing library attitude towards the use of open-source software and its gradual awareness of its long-term advantages.

Benefits Observed from Koha Adoption

The Koha open-source library management system has transformed library services and activities, particularly in resource-limited institutions and academically advanced institutions. The implementation of a Web-based, stable infrastructure has simplified common library processes, reducing customer wait times and increasing overall customer satisfaction. Such stability in the system, which is reflected in the reduction of downtime, has also increased operational reliability and consistency. The Online Public Access Catalogue (OPAC) stands out, enabling users to search and access institutional holdings from any location with internet access.

Financially, Koha does not require a regular software license fee, allowing libraries to allocate those funds towards infrastructure modernization, purchasing digital materials, or upgrading staff. This is particularly useful for public, school, and rural libraries with limited finances. In addition, the ability of Koha to be integrated with other digital library platforms is favorable to the institutional objectives of modernization and interoperability. It is connected with DSpace, which is a widely employed open-source digital file storage, and may be prepared to adapt RFID technology to computerize key functions.

This integration not only streamlines operations but also enhances user experience by providing seamless access to various resources. As libraries embrace these technological advancements, they can better serve their communities and meet the evolving demands of information access.

The main benefit of Koha in the long term is that it alleviates vendor lock-in issues. The libraries can modify the software to meet the needs of their region or call in outsourced developers as needed. This technological independence enables institutions to efficiently manage their data, swiftly introduce new capabilities, and ensure long-term sustainability. The extensive collaboration within the global Koha community facilitates the continuous sharing of best practices, updates, and security patches, thereby fostering a collective system of innovation.

Challenges Encountered During Koha Adoption

Koha, one of the most popular open-source library systems, faced various challenges during its adoption. To start with, there was a lack of technical skills among the library staff, particularly in educational institutions, which led to the fact that an external service of consultants

or even volunteers was involved, making the implementation process longer and increasing the risk of sustainability concerns. Migration of legacy proprietary software, especially LibSys and SOUL, was also a very daunting task, as enormous masses of bibliographic records and user data were held in closed or incompatible file forms. The operational job of cleaning, reformatting, and thoroughly testing this data addition turned out to be lengthy and technically challenging.

Second, staff resistance to change became identified as one of the main challenges of the library. The staff was used to the current systems; they were afraid of losing their jobs as a result of the automation, and they doubted Koha's capabilities. Unless it is properly trained and has well-planned change management strategies, this form of resistance may stall the successful implementation and utilization initiated by Koha.

Third, the reputation of Koha as software with strong customizing and localizing capability was notoriously difficult since one had to possess a highly skilled developer and designer to come up with a modification, which most institutions did not have, therefore increasing the period of implementation and cost associated with it. Poor internet infrastructure in rural areas and the lack of funding for colleges hindered the maximum use of Koha, as a stable connection was necessary for installation, regular updates, and remote access to the system.

Overall, successfully implementing Koha required careful consideration of significant issues related to technical capability, information management, employee training, implementation opportunities, and organizational structure. Achieving precedence over these limitations often depended on institutional dedication, harmonized national results, and community knowledge in the larger Koha community.

Role of Support Networks

Both formal and informal support networks, along with institutional bodies, significantly influenced the successful adoption and sustainability of Koha in Indian libraries from 2005 to 2014. The role of organizations like the INFLIBNET, NIC, and various schools of library and information science in spreading the word about open source in libraries and building the necessary skills in the community of librarians cannot be underestimated. However, these institutions know the technical sophistication of Koha and lack vendor-type support systems and, therefore, developed an integrated plan based on training and empowerment as the coordinating mechanism. For example, INFLIBNET conducted practical training programs, orientation sessions, and special seminars on Koha installation, configuration, and maintenance to help librarians who were only familiar with proprietary software understand this new open-source software. On the same note, the library and information science departments in some universities also include Koha in their curricula and laboratory work to introduce the students to real-life open-source ILS platform usage. Online communities and user groups—Koha User Group India (Koha-UG-IN)—further facilitated peer learning and collaborative problem-solving. These networks not only helped overcome the short-term impediments of technical unknowns but also facilitated long-term sustainability through local expertise, self-

assurance, and collaborative innovation. Subsequently, the Koha adoption in India was not only a technology improvement but also a capacity-building project that has strengthened the library profession and enhanced the open-source movement in India.

Conclusion

The 2005–2014 decade was a critical period of library automation evolution, and a new open-source integrated library system, Koha, emerged as a possible alternative to proprietary systems. It was not just a shift in the preference for technology in libraries but also a transition towards cheaper, more customizable, and more community-based solutions in library management. Schools, libraries, universities, and research organizations were attracted to Koha because of its ability to remove all licensing costs, its compliance with international standards, and the ease with which it could be integrated with various technologies, including RFID technology and institutional repositories. Amidst these advantages, there was a list of challenges that accompanied this shift. The major limitations that affected the early adopters were associated with a lack of technical knowledge, intricate data transfer procedures, employee opposition, and the absence of physical infrastructure, especially in rural or low-funded institutions. A chain of support systems, including INFLIBNET, NIC, and LIS schools, besides user communities like Koha-UG-IN, was important in shielding these hurdles. These bodies created a long-term training process, collaborative projects, and knowledge sharing to allow librarians to directly maintain their Koha code base, which not only helped to decouple them from their vendor, aggregating power in their community, but also ensured their sustainability. Therefore, Koha adoption represents a phenomenon that illustrates how open-source software can transform library functions by making them more inclusive, flexible, and adaptable to future changes. It highlights the importance of institutional backing, community cooperation, and capacity development for effectively deploying technological changes in the library sector. The experience of Koha from 2005 to 2014 can serve as a model for the thoughtful and strategically planned use of open-source systems in educational and public service fields.

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