

## **Library Automation Techniques and Tools through Library Software in India and Abroad for Higher Education System**

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### **Abstract**

Library automation has revolutionized the functioning of academic libraries, transforming the way information is managed, accessed, and disseminated. This study examines various library automation techniques and tools, with a focus on library software used in India and abroad, particularly in the higher education sector. The research highlights key software solutions, such as Integrated Library Systems (ILS), Digital Library Software (DLS), and cloud-based platforms that enhance library services and operations. Through comparative analysis, the study explores how automation improves efficiency, reduces manual tasks, and enhances access to information resources. It also considers the challenges and future trends in library automation, offering insights into how academic libraries can continue to evolve in the digital era.

### **Keywords**

- Library Automation
- Integrated Library Systems (ILS)
- Digital Library Software (DLS)
- Higher Education Libraries
- Library Management Systems (LMS)
- Cloud-based Library Solutions
- Academic Libraries
- Library Software in India
- Global Library Systems
- Information Technology in Libraries

### **Introduction**

The integration of automation in library systems has drastically transformed the management of libraries, especially in academic institutions. As libraries serve as the backbone of higher education, automation techniques and library software tools have become essential for streamlining operations, improving user experience, and ensuring efficient access to scholarly resources. Globally, academic libraries have adopted various software solutions to automate core functions such as cataloging,



circulation, acquisitions, and digital archiving. In India, where higher education is expanding rapidly, library automation is seen as crucial for meeting the increasing demands of students and faculty. This study delves into the library automation landscape, comparing the tools and techniques used in India and abroad, focusing on their contribution to the enhancement of higher education systems. Library automation is a cornerstone of modern academic libraries, playing a critical role in transforming how information is accessed, organized, and disseminated. Over the past few decades, advancements in information technology (IT) have drastically altered the landscape of library services, especially in higher education institutions where the demand for timely, efficient access to scholarly resources has increased exponentially. The adoption of library automation techniques and tools, particularly through specialized library software, has enabled institutions to manage vast collections of both physical and digital resources with unprecedented precision and ease.

In a globalized academic environment where knowledge-sharing has become more instantaneous, the role of libraries has evolved. No longer are libraries mere repositories of books and journals; they are dynamic learning hubs where information is curated, synthesized, and accessed through a variety of mediums. With the proliferation of digital content—e-books, e-journals, and databases—alongside traditional printed materials, academic libraries have faced the challenge of managing complex, ever-growing collections. Library automation serves as the solution to this challenge, streamlining operations like cataloging, acquisitions, circulation, interlibrary loans, and the management of digital archives.

Globally, higher education libraries have embraced a wide array of automation tools and systems, ranging from Integrated Library Systems (ILS) like Ex Libris Alma and SirsiDynix Symphony to open-source solutions such as KOHA, which has become particularly popular in developing countries. These systems enable libraries to automate routine administrative tasks, thereby reducing human error, improving workflow efficiency, and allowing library staff to focus on more value-added services such as research support, digital literacy training, and personalized user assistance.

In India, the higher education sector has seen remarkable growth, both in terms of the number of institutions and the volume of students and faculty requiring access to information resources. Indian universities and colleges are increasingly recognizing the need for robust library automation systems to meet the demands of their diverse and expanding user base. Initiatives such as the introduction of SOUL (Software for University Libraries) by INFLIBNET and E-Granthalaya by NIC (National Informatics Centre) have provided institutions with affordable and effective solutions tailored to the Indian context. These systems have empowered Indian academic libraries to keep pace with global standards while catering to the unique challenges of resource constraints and infrastructure limitations.

As digital literacy grows, there is an increasing expectation from students and researchers for seamless, 24/7 access to library resources—whether they are on campus or accessing the library remotely. The shift towards mobile-friendly library services, cloud-based systems, and digital repositories is a trend that underscores the importance of future-proofing library operations. Moreover, the emergence of data analytics, artificial intelligence (AI), and machine learning in library systems opens new possibilities for personalizing user experiences and optimizing resource management based on usage patterns.

The significance of library automation in enhancing the quality of education cannot be overstated. Efficient library management systems (LMS) ensure that students, faculty, and researchers have immediate access to the information they need, thus supporting academic excellence, facilitating research, and fostering a culture of continuous learning. In higher education, where knowledge production and dissemination are critical to institutional success, the importance of automated systems becomes even more pronounced.

However, despite the many benefits, implementing and maintaining these systems is not without challenges. Financial constraints, particularly in smaller or underfunded institutions, pose a significant barrier to the widespread adoption of advanced automation tools. The initial costs of acquiring, implementing, and training staff in the use of these systems can be prohibitive. Moreover, technical issues such as system integration, software updates, and the ongoing need for technical support also represent hurdles that institutions must navigate.

This study aims to provide an in-depth examination of the role of library automation techniques and tools through library software in enhancing the higher education system in India and abroad. By exploring the various technologies in use, their benefits, challenges, and the current trends driving the future of library automation, the research will offer valuable insights for library professionals, academic institutions, policymakers, and technologists alike. Furthermore, by comparing the tools and techniques used in India with those implemented in other parts of the world, this study will highlight best practices, uncover potential areas for improvement, and offer recommendations for the continued advancement of library automation in higher education.

## Definitions

- **Library Automation:** The use of information and communication technologies (ICT) to automate the traditional processes of a library, including cataloging, circulation, and management of resources.

- **Integrated Library System (ILS):** A comprehensive system that integrates various library functions such as acquisition, cataloging, circulation, and public access in one software solution.
- **Digital Library Software (DLS):** Software used to manage and provide access to digital collections, such as e-books, digital archives, and online journals.
- **Library Management System (LMS):** Software designed to handle all aspects of library administration, including acquisitions, cataloging, and user management.

## Need

The automation of libraries is critical in the modern era due to the exponential growth of digital information and the need for quick and efficient access to vast amounts of academic content. In higher education, where students and researchers rely on timely and accurate information, automation enhances productivity, reduces operational costs, and provides seamless access to both physical and digital resources. Additionally, library automation ensures greater accuracy in record-keeping, improves user satisfaction, and facilitates remote access to library resources, which has become essential during global disruptions such as the COVID-19 pandemic.

## Aims

- To analyze the role of automation techniques and tools in enhancing library services in academic institutions in India and abroad.
- To evaluate the impact of library automation on the efficiency and effectiveness of higher education libraries.
- To compare the features of various library software solutions used globally and in India.
- To identify the challenges and opportunities in implementing library automation systems in the higher education sector.

## Objectives

- To investigate the types of automation tools and software being used in higher education libraries.
- To assess the benefits and drawbacks of different library software platforms.
- To explore case studies of successful library automation initiatives in India and other countries.
- To provide recommendations for enhancing library automation in the context of evolving educational needs.

## Hypothesis

- **H1:** The adoption of advanced library automation tools significantly improves the efficiency and user satisfaction in higher education libraries.

- **H2:** The implementation of global library software solutions in Indian academic libraries faces unique challenges but offers substantial potential for improving information accessibility.

## Research Methodology

This research follows a mixed-method approach, combining qualitative and quantitative data collection techniques:

- **Literature Review:** A comprehensive review of academic papers, reports, and case studies on library automation and software tools.
- **Survey/Interviews:** Conducted with librarians, IT professionals, and academic staff from higher education institutions in India and abroad to gather firsthand data on their experiences with automation.
- **Comparative Analysis:** Examining key library software used in India (such as KOHA, SOUL, and E-Granthalaya) and globally (such as OCLC's WorldShare, Ex Libris Alma, and SirsiDynix Symphony).

## Strong Points

- Increased operational efficiency through the automation of manual tasks.
- Enhanced accessibility of digital and physical collections for users.
- Improved accuracy and organization of library data.
- Cost-effective management of resources and workflows.
- Facilitates remote access to library services.

## Weak Points

- High initial cost of implementation and maintenance.
- Resistance to change from staff accustomed to traditional methods.
- Technical issues and dependence on software vendors for support.
- Challenges in integrating new systems with existing infrastructure.

## Current Trends

- The growing use of **cloud-based library management systems (LMS)**, allowing for remote access and scalability.
- The rise of **open-source software** such as **KOHA** in India and other developing countries due to its cost-effectiveness.
- Integration of **Artificial Intelligence (AI)** and **machine learning** to enhance search capabilities and automate repetitive tasks.
- Increasing adoption of **digital libraries** to provide access to electronic resources, including e-books, research papers, and multimedia content.

- **Mobile library services** and the development of mobile apps for on-the-go access to library resources.

## History

The journey of library automation began in the mid-20th century with the introduction of early computerized systems in libraries. In the 1960s and 1970s, large academic libraries in Europe and North America pioneered the development of **Integrated Library Systems (ILS)**. By the 1980s, software solutions like **OCLC** and **MARC** formats were widely adopted. In India, library automation gained momentum in the 1990s with the advent of systems like **SOUL** (Software for University Libraries), developed by INFLIBNET, and **E-Granthalaya** by NIC. Over time, as libraries worldwide expanded their digital collections, automation tools evolved to manage electronic resources alongside physical collections.

## Discussion

The evolution of library automation has brought significant benefits to higher education, particularly in the management of academic resources and the delivery of services. This discussion focuses on the comparative analysis of software used globally and in India, evaluating their effectiveness in improving library operations. The study highlights how automation has changed the landscape of library management, offering insights into the potential for future innovations.

## Results

- Indian higher education libraries have widely adopted systems such as **KOHA** and **SOUL**, enhancing resource management and user engagement.
- Global systems like **Ex Libris Alma** and **SirsiDynix** offer advanced features but are less commonly used in India due to cost barriers.
- Cloud-based solutions are on the rise, offering greater flexibility and access to information for both students and faculty.

## Conclusion

Library automation has become an indispensable part of modern academic institutions, providing enhanced services, reducing manual workload, and ensuring the efficient use of resources. While India has made significant strides in adopting automation, there remain challenges related to funding, infrastructure, and staff training. Global systems offer a wealth of features but may not always be financially viable for Indian institutions.

## Suggestions and Recommendations

- Encourage wider adoption of **open-source software** such as **KOHA**, especially in resource-constrained institutions.
- Develop comprehensive training programs for librarians to handle new software systems.

- Invest in **cloud-based solutions** to provide remote access to users and improve scalability.
- Increase collaboration between libraries to share resources and expertise in automation.

## Future Scope

The future of library automation in higher education looks promising, with the increasing integration of AI, big data analytics, and mobile services. Further research can explore the role of automation in personalized learning and the development of digital libraries that support emerging educational technologies like virtual reality (VR).

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