

UNIT-1

Library Automation –Need , purpose, Advantage, Limitation , Area and Planning. Selection of Hardware and Software, Planning and Implantation of Library Automation

Library Management Softwaere KOHA, Libsys and SOUL

Definition: Library automation is the use of computers and other technologies to perform such traditional library activities as acquisitions, cataloging, and circulation¹. Library automation refers to the adequate participation or use of computers in library functions.

The purpose of library automation is to increase the efficiency, effectiveness, accuracy, and accessibility of library operations and services. It also helps to satisfy the library and patron needs that cannot be met by manual methods². Some of the advantages of library automation are:

- It reduces the workload and time of librarians and staff.
- It improves the organization and management of library collections and usage information.
- It provides easy access to electronic resources and other network or system resources, including the internet.
- It enhances the quality of service provided to patrons and remote users.
- It enables better integration and cooperation among libraries.

Need and Objective: Library automation is needed to modernize libraries, save the time of readers, make the library service cost-effective, increase the efficiency and speed of work, make information collection and information retrieval easier, and provide easy access to other network or system resources.

The need and objectives of library automation are to modernize libraries and improve their operations and services by using computers and other technologies. Some of the main reasons and goals of library automation are:

- To cope with the information explosion and the increasing volume and variety of literature that libraries have to acquire, store, and manage.
- To provide better accessibility and wider access to library resources for remote users and others, including online public access catalogs (OPACs), digital libraries, intranet access, etc.
- To satisfy the library and patron needs that cannot be met by manual methods, such as faster information retrieval, customized services, personalized recommendations, etc.
- To save the time of the reader and the librarian by reducing the workload and repetition of work in various activities such as acquisition, cataloging, circulation, serial control, etc.

- To have better control over the collection and usage information by maintaining accurate and updated records, reports, statistics, etc.
- To avoid duplication of work and wastage of resources by integrating different library functions and systems using integrated library software packages.
- To increase the efficiency and effectiveness of various activities and services by improving the organization, management, quality, and delivery of information.
- To make the library service cost-effective by optimizing the use of human and material resources.

Advantages: Library automation has many advantages such as reducing the paperwork, labor, and expenses involved in library operations, improving the accuracy and quality of library services, enhancing the user satisfaction and convenience, facilitating the sharing and exchange of bibliographic data among libraries, creating digital libraries and online catalogs, and enabling remote access to library resources.

Library automation has many benefits for libraries, librarians, and library patrons. Some of the advantages of library automation are:

- It makes it easier for patrons to use electronic resources, for example by providing barcode scanning or RFID tags that can be used to identify books.
- It reduces the workload and time for library staff in terms of cataloging, circulation, and acquisitions, freeing up time to provide a higher quality of service to library patrons.
- It improves the variety, amount, and quality of materials that are available in the library's collection¹². It also helps to weed out old, outdated, and irrelevant books and materials from the collection, which helps to keep the library's collection more updated and easier to find the right item.
- It streamlines and simplifies the library operations and services by using integrated library software packages that can automate various functions such as circulation, cataloging, acquisition, serial control, OPAC, digital library, intranet access, etc.
- It provides better accessibility and wider access to library resources for remote users and others, including online public access catalogs (OPACs), digital libraries, intranet access, etc.
- It increases the efficiency and effectiveness of various activities and services by improving the organization, management, quality, and delivery of information.
- It makes the library service cost-effective by optimizing the use of human and material resources.
- It prepares the library for the future by enabling it to adapt to the changing information scenario and technology trends.

Limitations: Library automation also has some limitations such as requiring high initial investment and maintenance costs, needing skilled staff and regular training, facing technical problems and compatibility issues, depending on the reliability and availability of hardware and software, posing security and privacy risks, and creating digital divide among users⁴.

Some of the steps involved in planning for library automation are:

- Conducting a feasibility study to analyze the current situation of the library, identify the problems and opportunities of automation, determine the scope and requirements of automation, estimate the costs and benefits of automation, and evaluate the alternatives and options available¹².
- Developing a strategic plan to define the vision, mission, goals, objectives, strategies, and action plans of automation, align them with the library's overall plan, prioritize them according to their importance and urgency, and assign responsibilities and timelines for their execution.
- Selecting the hardware and software that best suit the library's needs, budget, and infrastructure, considering factors such as functionality, compatibility, reliability, scalability, security, usability, support, maintenance, etc.
- Implementing the automation system by installing and configuring the hardware and software, converting and transferring the data from the existing system to the new system, testing and debugging the system, documenting the system specifications and procedures, etc.
- Evaluating the automation system by measuring its performance, quality, efficiency, effectiveness, user satisfaction, impact, etc., using various methods such as surveys, interviews, observations, statistics, etc., comparing them with the expected outcomes and standards, identifying the strengths and weaknesses of the system, and suggesting improvements and modifications if needed.
- Providing training and support to the staff and patrons by organizing orientation sessions, workshops, manuals, guides, help desks, etc., to familiarize them with the features and functions of the automation system, to enhance their skills and confidence in using the system, to resolve their queries and problems related to the system, etc.

Some additional points that you may want to include in your lecture notes are:

- The history and development of library automation
- The types and components of library automation systems
- The standards and protocols for library automation
- The challenges and opportunities for library automation in the future

The history and development of library automation can be traced back to the 1930s, when punch card equipment was used for circulation and acquisition in libraries. However, the progress on computer systems was slow until the 1950s, when the first experiments with computerized bibliographic records and cataloging were conducted. Some of the milestones in the history of library automation are:

- In 1956, the first computerized library catalog was created at the Armour Research Foundation in Chicago.
- In 1961, the first online catalog was developed at Ohio State University.
- In 1965, the Library of Congress initiated the MARC project to create a standard format for machine-readable cataloging.
- In 1967, the first integrated library system was developed at Case Western Reserve University.
- In 1971, OCLC (Online Computer Library Center) was established as a cooperative network of libraries for sharing bibliographic data and resources.
- In 1974, IFLANET (International Federation of Library Associations and Institutions Network) was launched as a global network of library associations and institutions.
- In 1988, the Z39.50 protocol was developed to enable interoperability among different library systems and databases.
- In 1991, the World Wide Web was introduced, which revolutionized the access and delivery of information resources on the Internet.
- In 1995, the Dublin Core Metadata Initiative was started to develop a simple and universal metadata standard for describing digital resources.
- In 2000, the Open Archives Initiative was launched to promote the free and open access to scholarly publications and data.

Library automation systems are software applications that help libraries to automate and digitize various aspects of their operations and services. There are different types and components of library

automation systems, depending on the functions and features they offer. Some of the common types and components are:

- ***Integrated Library System (ILS):*** This is the most basic and essential type of library automation system, which integrates various modules for managing different library functions, such as acquisition, cataloging, circulation, serials control, etc. The ILS acts as a comprehensive database and administrative tool for the library, enabling efficient and effective management of library resources and usage information¹².

- ***Barcode and RFID Technology:*** These are technologies that use labels or tags containing encoded information to identify, track, and manage library materials. Barcode technology uses optical scanning devices to read the information on the labels, while RFID technology uses radio frequency signals to detect and read the information on the tags. Both technologies help to streamline circulation, inventory, and security processes in libraries²³.

- ***Online Public Access Catalog (OPAC):*** This is a component that provides easy and convenient access to the library's catalog and resources for library users. The OPAC allows users to search, browse, reserve, and request library materials using various criteria, such as author, title, subject, keyword, etc. The OPAC also provides links to other information sources, such as digital libraries, databases, websites, etc²⁴.

- ***Electronic Resource Management (ERM):*** This is a component that helps libraries to manage their electronic resources, such as e-books, e-journals, databases, etc. The ERM enables libraries to acquire, organize, access, license, monitor, evaluate, and renew their electronic resources efficiently and effectively. The ERM also facilitates the integration of electronic resources with the ILS and the OPAC²⁵.

- ***Digital Repository:*** This is a component that helps libraries to create, store, preserve, and disseminate their digital collections, such as digitized books, manuscripts, images, audiovisuals, etc. The digital repository enables libraries to enhance the accessibility and visibility of their unique and valuable collections, as well as to support scholarly communication and research².

- ***Discovery Service:*** This is a component that helps libraries to provide a single point of access to their diverse and heterogeneous information resources. The discovery service enables users to search across multiple sources simultaneously using a simple and intuitive interface. The discovery service also provides features such as relevance ranking, faceted browsing, full-text linking, citation management, etc².

- ***Library Website and Mobile App:*** These are components that help libraries to establish their online presence and provide user-friendly access to their services and resources. The library website and mobile app enable users to access the library's information anytime and anywhere using various devices. The library website and mobile app also provide features such as user account management, online registration, feedback forms, social media integration, etc².

- ***Reporting and Analytics:*** These are components that help libraries to collect, analyze, and report data on their performance and impact. The reporting and analytics enable libraries to measure their usage statistics, user satisfaction levels, service quality indicators, resource utilization rates, etc. The reporting and analytics also help libraries to identify their strengths and weaknesses, evaluate their outcomes and outputs, and improve their decision making².

- ***Interlibrary Loan (ILL) and Resource Sharing:*** These are components that help libraries to share their resources with other libraries within or outside their network. The ILL and resource sharing enable libraries to expand their collection coverage, reduce their acquisition costs, and meet the diverse information needs of their users. The ILL and resource sharing also facilitate collaboration and cooperation among libraries.

Standards and protocols are the rules and guidelines that enable interoperability and compatibility among different library automation systems and components. They help to ensure the quality, consistency, and accessibility of library data and services. Some of the common standards and protocols for library automation are:

- ***Metadata Standards:*** These are standards that define the elements, formats, and structures of metadata, which is the data that describes the characteristics and attributes of library resources. Metadata standards help to identify, organize, retrieve, and exchange information about library resources. Some of the metadata standards used in library automation are:

- ***MARC (Machine-Readable Cataloging):*** This is a standard for encoding bibliographic data in a machine-readable format. MARC enables libraries to create, store, and share bibliographic records using a common structure and syntax¹.

- ***Dublin Core:*** This is a standard for creating simple and generic metadata for describing any type of resource. Dublin Core consists of 15 core elements, such as title, creator, subject, date, etc., that can be used to describe resources in a cross-domain and interoperable way².

- ***MODS (Metadata Object Description Schema):*** This is a standard for creating descriptive metadata for library resources. MODS is based on MARC but uses XML (Extensible Markup Language) as the encoding syntax. MODS provides a flexible and rich schema for describing various types of resources in a hierarchical way³.

- ***METS (Metadata Encoding and Transmission Standard):*** This is a standard for encoding descriptive, administrative, and structural metadata for digital objects. METS uses XML as the encoding syntax and provides a framework for packaging metadata and digital content into a single file or package.

- ***Information Exchange Standards:*** These are standards that define the methods, formats, and protocols for exchanging information among different library systems and components. Information exchange standards help to facilitate data transfer, communication, and interoperability among libraries. Some of the information exchange standards used in library automation are:

- ***Z39.50:*** This is a standard protocol for searching and retrieving information from remote databases. Z39.50 enables users to query multiple databases using a single interface and receive consistent results in a common format.

- *OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting):* This is a standard protocol for harvesting metadata from digital repositories. OAI-PMH enables repositories to expose their metadata to service providers who can aggregate, index, and provide access to the metadata.

- *SRU (Search/Retrieve via URL):* This is a standard protocol for searching and retrieving information using web technologies. SRU enables users to send queries and receive results using HTTP (Hypertext Transfer Protocol) requests and responses in XML format.

- *SIP2 (Standard Interchange Protocol Version 2):* This is a standard protocol for communicating between an ILS (Integrated Library System) and self-service devices, such as self-check machines, kiosks, etc. SIP2 enables the devices to access and update the ILS data, such as patron information, circulation status, etc.

- *Presentation Standards:* These are standards that define the appearance, layout, and style of displaying information on various devices and platforms. Presentation standards help to enhance the usability, accessibility, and readability of information for users. Some of the presentation standards used in library automation are:

- *HTML (Hypertext Markup Language):* This is a standard language for creating web pages and web applications. HTML uses tags to define the structure and content of web documents.

- *CSS (Cascading Style Sheets):* This is a standard language for defining the style and appearance of web documents. CSS uses rules to specify how HTML elements should be displayed on different devices and platforms.

- *XML (Extensible Markup Language):* This is a standard language for creating structured and self-describing data. XML uses tags to define the elements and attributes of data in a hierarchical way.

- *XSLT (Extensible Stylesheet Language Transformations):* This is a standard language for transforming XML data into other formats, such as HTML, PDF, etc. XSLT uses templates to specify how XML elements should be processed and outputted.

Library automation is the process of using technology to perform various library functions and services, such as acquisition, cataloging, circulation, etc. Library automation has many benefits, such as improving efficiency, accuracy, quality, and user satisfaction. However, library automation also faces many challenges and opportunities in the future. Some of them are:

- *Challenges:* Library automation requires a lot of resources, such as funding, infrastructure, equipment, software, staff, training, etc., which may not be easily available or affordable for many libraries, especially in developing countries. Library automation also involves complex technical issues, such as compatibility, interoperability, security, privacy, reliability, etc., which may pose difficulties or risks for libraries. Library automation also requires constant updating and maintenance to keep up with the changing needs and expectations of users and the evolving information environment. Library automation also creates new roles and responsibilities for librarians, who need to acquire new skills and competencies to manage and use technology effectively¹²³.

- ***Opportunities:** Library automation offers many opportunities for libraries to enhance their services and impact in the future. Library automation enables libraries to provide access to a wider range of information resources in various formats and languages, both within and beyond their physical boundaries. Library automation also enables libraries to create and share their own digital collections and content, as well as to participate in collaborative networks and initiatives with other libraries and organizations. Library automation also enables libraries to provide more personalized and interactive services to users, such as recommendations, alerts, feedback, etc. Library automation also enables libraries to collect and analyze data on their performance and usage, which can help them to improve their decision making and planning¹⁴.

Selection of hardware and software and planning and implementation of library automation are the crucial steps for achieving successful library automation. They involve the following aspects:

- ***Selection of hardware:** Hardware refers to the physical devices and equipment that are used for library automation, such as computers, servers, scanners, printers, barcode readers, RFID tags, etc. The selection of hardware depends on various factors, such as the size and type of the library, the budget and resources available, the compatibility and interoperability with other systems and components, the reliability and durability of the hardware, the maintenance and support services provided by the vendors, etc. The selection of hardware should be done after a careful analysis of the current and future needs of the library, as well as a comparison of the features and costs of different hardware options¹².

- ***Selection of software:** Software refers to the programs and applications that are used for library automation, such as integrated library systems (ILS), online public access catalogs (OPAC), electronic resource management (ERM), digital repository, discovery service, etc. The selection of software depends on various factors, such as the functionality and features of the software, the compatibility and interoperability with other systems and components, the user-friendliness and flexibility of the software, the security and privacy of the software, the customization and scalability of the software, the licensing and pricing of the software, etc. The selection of software should be done after a careful evaluation of the requirements and objectives of the library, as well as a comparison of the benefits and drawbacks of different software options¹². There are two types of software available for library automation: proprietary software and open source software. Proprietary software is developed and owned by a specific company or organization, which charges a fee for using or accessing the software. Open source software is developed and maintained by a community of developers and users, who share the source code and allow anyone to use or modify the software for free³.

- ***Planning and implementation of library automation:** Planning and implementation of library automation are the processes of designing and executing the library automation project, which involve various stages, such as:

- ***Needs assessment:** This is the stage where the library identifies its current situation, problems, goals, expectations, and priorities for library automation. The needs assessment helps to determine the scope, feasibility, cost-effectiveness, and benefits of library automation¹².

- ***Project proposal:*** This is the stage where the library prepares a detailed document that outlines the objectives, strategies, activities, resources, budget, timeline, evaluation criteria, etc., for library automation. The project proposal helps to justify and communicate the need and value of library automation to various stakeholders, such as management, staff, users, funders, etc¹².

- ***Project team:*** This is the stage where the library forms a group of people who are responsible for planning and implementing library automation. The project team should consist of representatives from different departments and levels of the library, as well as external experts or consultants if needed. The project team should have clear roles, responsibilities, and authority for carrying out the project tasks.

- ***Vendor selection:*** This is the stage where the library selects the hardware and software vendors who will provide the products and services for library automation.

The vendor selection should be done after a thorough market survey, request for proposal (RFP), bid evaluation, and contract negotiation. The vendor selection should be based on criteria such as quality, reliability, compatibility, support, etc.

- ****Installation and configuration:****

This is the stage where the hardware and software are installed and configured in accordance with the specifications and requirements of the library. The installation and configuration should be done by qualified technicians, with proper testing, documentation, and backup.

- ***Data conversion:***

This is the stage where the existing data of the library, such as bibliographic records, patron records, circulation records, etc., are converted into a compatible format

for use with the new system. The data conversion should be done with accuracy, consistency, and completeness, with proper verification, validation, and correction.

- ***Staff training:***

This is the stage where the staff members of the library are trained on how to use the new system effectively and efficiently. The staff training should be done

before the system goes live and should cover both technical and operational aspects of the system. The staff training should be done by qualified trainers, with proper manuals, guides, and feedback.

- ***System testing:***

This is the stage where the new system is tested for its functionality, performance, and reliability under various conditions and scenarios. The system testing

should be done by both staff members and users, with proper evaluation, reporting, and troubleshooting.

- ***System launch:***

This is the stage where the new system is officially launched and made available to the staff members and users. The system launch

should be done after ensuring that all the previous stages are completed successfully and that the system is ready for operation. The system launch should be done with proper publicity, promotion, and support.

- ***System maintenance:***

This is the stage where the new system is maintained and updated regularly to ensure its optimal functioning and performance. The system maintenance involves various activities, such as backup, recovery, security, troubleshooting, upgrading, etc. The system maintenance should be done by qualified staff members or vendors, with proper monitoring, reporting, and feedback.

Koha, Libsys and Soul are three popular library management software that are used by many libraries for automation and digitization of their operations and services. They have different features, advantages, and disadvantages, depending on the needs and preferences of the libraries. Here is a brief comparison of these three software:

KOHA Software

Koha is the world's first free and open source library software that is used by more than 5,000 libraries of various types and sizes worldwide. It is a fully featured, scalable library management system that supports all essential library functions such as circulation, cataloging, acquisition, serials management, OPAC, etc. It also offers features such as web services API, Z39.50 server and client support, MARC21 and UNIMARC support for cataloging records exchange, etc.

Koha is developed by a community of librarians, developers, volunteers, and support companies who collaborate to improve and enhance the software. Koha is free software and is licensed under the GNU General Public License, which means that anyone can use, modify, and distribute it without any restrictions.

Koha can be installed on various operating systems such as Debian, Ubuntu, Windows, etc., using packages or source code. Koha can also be accessed online through hosted services provided by various companies.

- ***Koha:*** Koha is an open source integrated library system (ILS) that was developed by the Koha community in 2000. Koha is written in Perl, JavaScript, and HTML languages and runs on Linux operating system. Koha supports various modules for managing different library functions, such as acquisition, cataloging, circulation, serials control, etc. Koha also provides features such as online public access catalog (OPAC), electronic resource management (ERM), digital repository, discovery service, etc. Koha is compliant with international standards such as MARC21, AACR2, MARCXML, Z39.50, OAI-PMH, SRU, SIP2, NCIP 2.0, etc.

- ***Advantages:*** Some of the advantages of Koha are:

- It is free and open source, which means that libraries can use or modify it without any license fee or restriction.

- It has a large and active community of developers and users who provide support, updates, and enhancements to the software.

- It has a user-friendly and customizable interface that can be adapted to different languages and preferences.

- It has a modular and scalable architecture that can handle large and complex data and transactions.

- It has a web-based platform that can be accessed from anywhere using any device.

- ***Disadvantages:*** Some of the disadvantages of Koha are:
 - It requires technical expertise and resources to install, configure, maintain, and troubleshoot the software.
 - It may not be compatible or interoperable with some existing systems or components in the library.
 - It may not meet some specific requirements or expectations of some libraries or users.

Libsys Software

Libsys is an integrated library system (ILS) that was first released in 1988 and since then it has been implemented in a large number of libraries. The Libsys software was designed and developed to manage small and large library operations. It has successfully provided enriched experience to library managers and patrons.

Libsys offers various solutions for libraries, academic campuses, retailers, and specific business applications. It also provides RFID deployments and design and architecture services. Some of the products offered by Libsys are:

- **LIBSYS 10:** A web-based library management system that covers all aspects of library automation such as acquisition, cataloging, circulation, serials control, OPAC, digital library, etc. It also provides features such as barcode scanning, RFID tags, SMS alerts, email notifications, reports generation, etc.

- **LSDiscovery:** A discovery tool that allows users to search and access various resources such as books, e-books, journals, articles, etc., from a single interface. It also provides features such as federated searching, faceted browsing, relevance ranking, etc.

- **LSRemote:** A remote access service that enables users to access the library resources from anywhere and anytime using their mobile devices or computers. It also provides features such as authentication, encryption, usage statistics, etc.

- **LSe-RMS:** An electronic resource management system that helps librarians to manage the subscription, access, usage, and evaluation of electronic resources such as e-books, e-journals, databases, etc. It also provides features such as alerts, reminders, reports, etc.

- LSEase: A library management system that is a perfect solution for the automation of small libraries and resource centers with basic needs. It is derived from LIBSYS 10 software and is a cost-effective value proposition. LSEase configures the entire library workflow easily with the latest software technology.

- *Libsys:* Libsys is a proprietary library automation software that was developed by Libsys Ltd in 1986. Libsys is written in C++ language and runs on Windows operating system. Libsys supports various modules for managing different library functions, such as acquisition, cataloging, circulation, serials control, etc. Libsys also provides features such as OPAC, ERM, digital repository, discovery service, etc. Libsys is compliant with international standards such as MARC21, AACR2, MARCXML, Z39.50, OAI-PMH, SRU, SIP2, et.

- *Advantages:* Some of the advantages of Libsys are:

- It is a well-established and widely used software that has a proven track record of performance and reliability.

- It has a professional and dedicated team of developers and support staff who provide quality products and services to the customers.

- It has a rich and comprehensive functionality that covers all aspects of library management and service delivery.

SOUL Software

Soul is an acronym for SOfware for University Libraries. It is an integrated library system (ILS) that was designed and developed by the INFLIBNET Centre based on the requirements of college and university libraries. It is a user-friendly software that works under client-server environment.

Soul has various modules that cover all the aspects of library automation such as acquisition, cataloging, circulation, serials control, OPAC, digital library, etc. It also provides features such as barcode scanning, RFID tags, SMS alerts, email notifications, reports generation, etc.

Soul is compliant to international standards such as MARC 21 bibliographic format, Unicode based Universal Character Sets for multilingual bibliographic records and NCIP 2.0 and SIP 2 based protocols for electronic surveillance and control.

Soul has three versions: Soul 1.0, Soul 2.0 and Soul 3.0. The latest version of Soul i.e. Soul 3.0 was released in February 2021. The database for Soul 3.0 is designed for latest versions of MS-SQL and MySQL (or any other popular RDBMS).

Soul is suitable not only for academic libraries, but also for all types and sizes of libraries, even school libraries¹². Soul is available for download from the official website of INFLIBNET Centre or from other sources