

SEM: 4TH
SUB: LIBRARY AUTOMATION

Unit 1 Popular Integrated Library Management Software

- **1. Koha**
- **Introduction**
- **Koha** is the world's first **open-source Integrated Library Management System (ILMS)**.
It was developed in **1999** by **Katipo Communications** in New Zealand.
- The word *Koha* meaning “gift” or “donation.”
- It is widely used in:
 - Academic libraries
 - Public libraries
 - School libraries
 - Special libraries
 - Consortia-based libraries
- Koha works on **Linux server environment** and uses:
 - MySQL/MariaDB database
 - Apache web server
 - Perl programming language

- **Important Features of Koha**
- **1. Fully Web-Based System**
- Accessible through web browser
- No client-side installation required
- **2. Open Source**
- Free to download and modify
- Customizable as per institutional needs
- **3. Modular Structure**
- Major modules include:
- Acquisition
- Cataloguing
- Circulation
- Serial Control
- OPAC
- Reports
- Administration
- **4. MARC Support**
- MARC21 and UNIMARC compatible
- Z39.50 client/server support

- **5. OPAC (Online Public Access Catalogue)**
- Web OPAC
- User login facility
- Book reservation
- Online renewal
- **6. RFID & Barcode Integration**
- Supports modern circulation technologies
- **7. Multi-Branch Support**
- Suitable for university systems with multiple campuses
- **8. Report Generation**
- Customizable SQL-based reports
- **9. Authority Control**
- Helps maintain uniform headings
- **10. Community Support**
- Large international developer community

- **2. Libsys**
- **Introduction**
- **Libsys** is a **commercial Library Management Software** developed in India by **Libsys Corporation** (established 1984).
- It is widely used in:
 - University libraries
 - Research institutions
 - Government libraries
 - Corporate information centers

- **Important Features of Libsys**
- **1. Client-Server Architecture**
- Earlier DOS-based
- Later Windows and Web versions available
- **2. Modular Design**
- Main modules:
- Acquisition
- Cataloguing
- Circulation
- Serials Control
- OPAC
- Article Indexing
- **3. MARC21 Compatibility**
- Standardized bibliographic records

- **4. Barcode & RFID Support**
- **5. Union Catalogue Creation**
- Useful for networks
- **6. Multilingual Support**
- Supports Indian languages
- **7. Security Control**
- Password-based user roles
- **8. Strong Presence in India**
- One of the earliest Indian LMS

3. Virtua

- **Introduction**
- **Virtua is a commercial Integrated Library System (ILS) developed by VTLS Inc. (Virginia Tech Library Systems).**
- It is internationally recognized and used in:
 - National libraries
 - University libraries
 - Large consortia

- **Important Features of Virtua**
- **1. Highly Scalable System**
- Suitable for very large databases
- **2. MARC & Metadata Support**
- MARC21
- UNIMARC
- Dublin Core
- **3. Multilingual Interface**
- Unicode compliant
- **4. Client-Server + Web-Based Interface**
- **5. Strong Authority Control**
- **6. Advanced Acquisitions & Serials Module**
- **7. Consortium Management**
- Shared bibliographic database
- **8. Z39.50 Protocol Support**
- **9. FRBR Support**
- Functional Requirements for Bibliographic Records

4. SOUL

- **Introduction**
- **SOUL (Software for University Libraries)** is developed by INFLIBNET Centre under the University Grants Commission (UGC), India.
- It is specially designed for:
 - College libraries
 - University libraries
 - Institutions participating in INFLIBNET programmes
- Latest version: SOUL 2.0 (client-server architecture)

- **Important Features of SOUL**
- **1. Designed for Indian Academic Libraries**
- Customized to Indian university needs
- **2. Modular Structure**
- Modules include:
 - Acquisition
 - Cataloguing
 - Circulation
 - Serials Control
 - OPAC
 - Administration
- **3. MARC21 Based Database Structure**
- **4. Barcode Integration**
- **5. User-Friendly Interface**
- **6. Network Version Available**
- Supports multi-user environment
- **7. Strong Support System**
- Training provided by INFLIBNET
- **8. Data Import/Export Facility**

Comparative Overview

Feature	Koha	Libsys	Virtua	SOUL	
Nature	Open Source	Commercial	Commercial	Semi-commercial (UGC supported)	
Origin	New Zealand	India	USA	India	
Web Based	Yes	Yes (latest)	Yes	Partial	
MARC21	Yes	Yes	Yes	Yes	
Suitable For	All types	Academic & Special	Large/National	University & Colleges	
Customization	High	Limited	Limited	Moderate	

Unit II
Preservation of Library Database

- **Preservation of Library Database**
- Preservation of a library database means **protecting digital data from loss, damage, unauthorized access, and misuse**, and ensuring long-term availability.
- **Safety and Security of Library Database**
- **Safety of Database**
- Protection from **physical damage** (fire, flood, power failure)
- Use of **UPS and backup power**
- Proper server room conditions (temperature, humidity)
- Regular maintenance of hardware and software
- **Security of Database**
- Protection from **unauthorized access**
- Use of **user IDs and strong passwords**
- Access control (admin, staff, user levels)
- Encryption of sensitive data
- Regular system updates and patches

- **Database Security Threats**
- **Meaning of Database Security**
- Database security means protecting a database from unauthorized access, misuse, damage, or theft.

- **(a) Internal Threats**
- Unauthorized access by staff
- Accidental deletion or modification of data
- Weak passwords
- **(b) External Threats**
- Hacking
- Malware and viruses
- Ransom ware attacks
- Phishing
- **(c) Technical Threats**
- Hardware failure
- Software bugs
- Power failure
- Network failure

- **Database Backup: Ways and Methods**
- **Meaning of Database Backup**
- Database backup is the **process of creating copies of data** to restore it in case of data loss.
- **Types of Backup Methods**
- **(a) Full Backup**
- Complete copy of the entire database
- Takes more time and storage
- Used periodically
- **(b) Incremental Backup**
- Backs up only data changed after last backup
- Saves time and storage
- **(c) Differential Backup**
- Backs up data changed since last full backup
- Faster than full backup
- **Backup Storage Options**
- External hard drives
- Network storage (NAS)
- Cloud storage
- Off-site storage

- **Importance of Database Preservation**
- Prevents data loss
- Ensures continuity of library services
- Protects user records
- Supports digital preservation goals

Unit III

Emerging Tools and Technologies in Library Automation

- **Cloud Computing and Its Applications in Libraries**
- **1. What is Cloud Computing?**
- **Cloud computing** means storing data and using software on the **internet** instead of on a library's own computer or server.
- ☞ Simply put:
“Cloud = Internet-based storage and services.”
- Libraries do not need to install heavy software or buy costly servers. They can use services online.
- **2. Need of Cloud Computing in Libraries?**
- Libraries have large amounts of data
- Users want access anytime and anywhere
- Maintenance of computers and servers is costly
- Cloud computing helps libraries manage these problems easily.

- **Main Features of Cloud Computing**
- **Easy Access**
Library staff and users can access services using the internet.
- **Less Cost**
No need to buy expensive hardware.
- **Automatic Updates**
Software is updated by the service provider.
- **Large Storage Space**
Libraries can store huge amounts of data.
- **Scalability**
Storage and services can be increased when needed.

- **Types of Cloud Services**
- **1. Software as a Service (SaaS)**
- Ready-made software available online
- Example: Online Library Management System
- **2. Platform as a Service (PaaS)**
- Used to develop applications
- Example: Creating a library website
- **3. Infrastructure as a Service (IaaS)**
- Online storage and servers
- Example: Storing digital library data

Types of Cloud Deployment

- **Public Cloud**
Used by many organizations (e.g., Google Drive)
- **Private Cloud**
Used by one library or institution only
- **Hybrid Cloud**
Combination of public and private cloud
- **Applications of Cloud Computing in Libraries**
- **1. Library Management System (LMS)**
- Cloud-based LMS helps in:
- Cataloguing
- Circulation
- Acquisition
- Serials control
- Examples:
- Koha (cloud version)
- Alma

- **2. Digital Libraries**
- Libraries store:
- E-books
- E-journals
- Old manuscripts
- Question papers
- Users can access them online.
- **3. Institutional Repositories**
- Used to store:
- Theses
- Dissertations
- Research papers
- Examples:
- DSpace on cloud
- **4. Data Storage and Backup**
- Library data is stored safely
- Automatic backup protects data from loss
- **5. Resource Sharing**
- Sharing books and resources between libraries
- Union catalogues and inter-library loan
- **6. Remote Access**
- Users can access library resources from home
- Useful for students and researchers

- **Advantages of Cloud Computing in Libraries**

- Saves money
- Saves time
- Easy to use
- 24×7 access
- Better services to users

- **8. Problems / Limitations**

- Internet dependency
- Data security issues
- Privacy concerns
- Limited control over data

Barcode

- A **barcode** is a set of **parallel black lines** of different widths printed on an item. These lines store information that can be read by a **barcode scanner**.
- In libraries, barcodes are mainly used to **identify books and users**.
- **Components of a Barcode System**
 - **Barcode Label** – Printed on books or library cards
 - **Barcode Scanner** – Reads the barcode
 - **Computer System** – Processes the data
 - **Library Management Software** – Stores and manages records
- **Uses of Barcode in Libraries**
 - Book circulation (issue and return)
 - Member identification
 - Stock verification
 - Tracking library materials
 - Reducing manual work

- **Advantages of Barcodes**

- Fast processing
- Reduces human errors
- Easy to use
- Saves time and labor
- Low cost

- **Limitations of Barcodes**

- Can store limited data
- Needs proper scanning angle
- Barcode labels can get damaged
- Requires barcode scanner

QR Code (Quick Response Code)

- **QR Code (Quick Response Code)**
- **3.1 What is a QR Code?**
- A **QR Code** is a **square-shaped, two-dimensional barcode** that stores information such as text, URLs, images, or documents.
- It can be scanned using **smart phones** or QR scanners.
- **Features of QR Code**
- Stores large amount of data
- Can be scanned from any direction
- Works even if partially damaged
- No special scanner required
- **Types of QR Codes**
- **Static QR Code**
 - Information cannot be changed
- **Dynamic QR Code**
 - Information can be edited later
- **Uses of QR Code in Libraries**
- Linking to OPAC records
- Access to e-books and e-journals
- Library website links
- Orientation guides
- Event information
- Virtual tours of library

- **Advantages of QR Codes**

- Easy to create and use
- Saves space
- User-friendly
- Supports mobile access
- Cost-effective

- **Limitations of QR Codes**

- Requires smart phone and internet
- Users need basic digital skills
- Security risks if linked to unsafe sites

Library Website

- **What is a Library Website?**
- A **library website** is a set of web pages created by a library to give information about:
 - Library services
 - Library resources
 - Library rules and activities
 - It acts as the **online face of the library**.
- **Library Website** = Tells users **about the library**
- **Information Available on a Library Website**
 - About the library
 - Library hours
 - Membership details
 - Rules and regulations
 - OPAC link
 - New arrivals
 - Contact information
 - Library staff details

- **Advantages of Library Website**

- Available 24×7
- Easy access to information
- Low cost
- Improves library visibility

- **Limitations of Library Website**

- Mostly provides **static information**
- Limited interaction with users
- Needs regular updating

Library Portal

- **3.1 What is a Library Portal?**
- A **library portal** is an advanced online platform that provides **single-window access** to many library resources and services.
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- **“One login – many resources.”**
- **Library Portal** = Helps users **use the library**
- **Services Available Through a Library Portal**
- OPAC access
- E-books and e-journals
- Databases
- Institutional repository
- Remote access
- User account management
- Ask-a-librarian service
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- **Uses of Library Portal**
- Easy access to digital resources
- Supports teaching and research
- Saves user time
- Improves user satisfaction

- **Advantages of Library Portal**

- Single access point
- Personalized services
- Supports digital learning
- Better resource usage

- **Limitations of Library Portal**

- Needs good internet connection
- Requires technical support
- Higher cost than website
- Users need basic digital skills

RFID (Radio Frequency Identification)

- **Introduction**
- **RFID** stands for **Radio Frequency Identification**.
It is a technology used to **identify and track library materials** using **radio waves**.
- RFID is widely used in **modern automated libraries** to improve speed, accuracy, and security.
- **2. What is RFID?**
- RFID is a system where information is stored in a **small electronic tag** attached to a book or library item.
This information is read by an **RFID reader** without physical contact.
- **RFID allows automatic identification without touching or seeing the item directly.**
- **. Components of RFID System**
- **RFID Tag**
 - Attached inside books
 - Stores book and item details
- **RFID Reader**
 - Reads information from the tag
 - Installed at circulation desk, gates, or kiosks
- **Antenna**
 - Sends and receives radio signals
- **Library Management Software**
 - Stores and manages RFID data

- **Applications of RFID in Libraries**
- **1. Circulation (Issue and Return)**
- Faster book issue and return
- Multiple books can be issued at once
- **2. Self-Service**
- Users can issue/return books themselves
- Reduces staff workload
- **3. Security and Theft Control**
- RFID gates detect unauthorized removal of books
- **4. Stock Verification**
- Quick inventory checking
- Saves time and effort
- **5. Book Sorting and Tracking**
- Helps locate misplaced books
- Improves shelf management

Advantages of RFID in Libraries

- Saves time
 - Reduces human errors
 - No line-of-sight required
 - Faster stock checking
 - Improves user satisfaction
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- **Limitations of RFID**
 - High initial cost
 - Privacy concerns
 - Technical issues
 - Requires trained staff
 - Interference from metal or liquids

Unit 4 Library Networking and Resource Sharing

- LIBRARY NETWORKING
- **Meaning of Library Networking**
- **Library Networking** means linking two or more libraries through communication technology (computers, internet, software) to share resources and services.
- It helps libraries work together instead of working alone.
- Example of major library networks:
- OCLC
- INFLIBNET Centre
- DELNET
- **2. Need for Library Networking**
- Library networking became necessary due to the following reasons:
- **1 Growth of Information**
- Large number of books, journals, e-resources are published daily.
- No single library can collect everything.
- **2 High Cost of Documents**
- Books and journals are expensive.
- Libraries cannot afford all resources.
- **3 Limited Library Budget**
- Polytechnic and college libraries have limited funds.
- **4 Demand for Quick Information**
- Users expect fast and accurate information.
- Networking helps provide quick access.
- **5 Technological Development**
- Internet and digital libraries make networking possible.

- **3. Objectives of Library Networking**

- The main objectives are:

- **1 ☐ Resource Sharing**

- To share books, journals, databases, and other materials among libraries.

- **2 ☐ Avoid Duplication**

- To reduce unnecessary purchase of the same costly materials.

- **3 ☐ Improve Access**

- To provide access to national and international resources.

- **4 ☐ Promote Cooperation**

- To develop cooperation among libraries and institutions.

- **5 ☐ Union Catalogue Creation**

- To create a combined catalog of many libraries.

- **6 ☐ Support Research and Education**

- To provide better academic support to students and faculty.

- **Resource Sharing**
- **Meaning**
- **Resource Sharing** means sharing library materials and services among libraries for mutual benefit.
- It ensures maximum use of available resources.
- **Types of Resource Sharing**
- Inter-Library Loan (ILL)
- One library borrows books from another library for its users.
- **Document Delivery Service**
- Providing photocopies or scanned copies of articles.
- **Union Catalogue**
- A combined list of holdings of different libraries.

- **Cost Saving**
- Reduces duplication of costly materials
- Better Utilization of Resources.
- Time Saving
- **Professional Cooperation**

- **1. DELNET**
- **Full Form:**
- **Developing Library Network (DELNET)**
- **Established:**
- 1988
- **Headquarters:**
- New Delhi

- **Meaning:**
- DELNET is a major library network in India that promotes **resource sharing among libraries**.

- **Objectives:**
- To promote library networking in India
- To develop a **union catalogue**
- To facilitate **inter-library loan (ILL)**
- To share books, journals, theses, and articles

- **Services:**
- Union Catalogue of Books
- Union Catalogue of Periodicals
- Database of Theses & Dissertations
- Inter-Library Loan Service
- Document Delivery Service

- **Importance:**
- Helps small libraries access large collections
- Reduces duplication of costly materials
- Supports academic and research institutions

- **2. INFLIBNET**
- **Full Form:**
- **Information and Library Network Centre (INFLIBNET)**
- **Established:**
- 1991
- **Headquarters:**
- Gandhinagar, Gujarat
- **Under:**
- University Grants Commission (UGC)
- **Meaning:**
- INFLIBNET is an autonomous centre of UGC that connects university and college libraries across India.
- **Objectives:**
- Promote automation of libraries
- Develop union databases
- Support research and higher education
- Promote resource sharing
- **Major Programmes:**
- Shodhganga (Theses repository)
- E-ShodhSindhu
- N-LIST
- Union Catalogue (IndCat)

- **3. E-ShodhSindhu**
- **Managed by:**
- **Information and Library Network Centre**
- **Meaning:**
- E-ShodhSindhu is a **consortium for e-journals and e-books**.
- It was formed by merging:
- UGC-INFONET Digital Library Consortium
- N-LIST
- INDEST-AICTE Consortium
- **Objectives:**
- Provide access to high-quality e-resources
- Reduce subscription cost through group negotiation
- Support research and higher education
- **Services:**
- Access to e-journals
- Access to e-books
- Online databases
- Remote access facilities
- **Benefits:**
- Cost-effective subscription
- Access to international publishers
- Supports research scholars and faculty

- **4. ICAR – CeRA**
- **Full Form:**
- **Consortium for e-Resources in Agriculture (CeRA)**
- **Under:**
- **Indian Council of Agricultural Research (ICAR)**
- **Meaning:**
- CeRA is an online platform providing access to agricultural research journals.
- **Objectives:**
- Provide access to agricultural e-journals
- Support agricultural education and research
- Strengthen agricultural universities
- **Services:**
- Full-text access to agricultural journals
- Online database access
- Research support
- **Importance:**
- Useful for agricultural universities and research institutes
- Improves quality of agricultural research
- Provides global research access

Unit V

Automated library Service

- **Introduction**
- Libraries provide different **information services** to help users find, access, and use information effectively.
- Among the most important services are:
 - Bibliographic Service
 - Document Delivery Service (DDS)
 - Reference Service
- **What is Bibliographic Service?**
- **Bibliographic service** helps users **know about documents** (books, journals, articles) available on a subject.
It does **not provide the document itself**, but gives **information about documents**.
- **Types of Bibliographic Services**
- **Bibliographies**
 - List of books or articles on a topic
- **Indexes**
 - Help locate articles in journals
- **Abstracts**
 - Short summaries of documents
- **Catalogues**
 - List of library holdings
- **Current Awareness Service (CAS)**
 - Information about new publications
- **Selective Dissemination of Information (SDI)**
- Subject-specific information for users

- **Importance of Bibliographic Service**
- Saves user time
- Helps in research work
- Keeps users up to date
- Improves use of library resources

Document Delivery Service (DDS)

- **What is Document Delivery Service?**
- **Document Delivery Service** provides **copies of documents** requested by users.
- In simple words:
“User asks → Library delivers the document.”
- **Types of Documents Delivered**
- Journal articles
- Book chapters
- Conference papers
- Theses and dissertations
- **Methods of Document Delivery**
- **Photocopy**
- **Email (PDF)**
- **Postal service**
- **Online document delivery**

- **Sources of Document Delivery**

- Own library collection
- Other libraries
- Inter-Library Loan (ILL)
- Online databases

- **Importance of DDS**

- Provides access to rare documents
- Supports research and education
- Saves time and effort
- Helps libraries share resources

- **Limitations of DDS**

- Copyright issues
- Delay in delivery
- Cost involved
- Internet dependency

- **Reference Service**
- **4.1 What is Reference Service?**
- **Reference service** is **personal assistance** provided by librarians to help users find information.
- ☞ According to Ranganathan:
Reference service is help given to readers in using library resources.
- **4.2 Types of Reference Service**
- **1. Ready Reference Service**
- Simple and quick answers
- Example:
 - Capital of India
 - Definition of a term
- **2. Long Range Reference Service**
- Detailed and in-depth help
- Example:
 - Research topic assistance
 - Literature search
- **Methods of Reference Service**
- Face-to-face
- Telephone
- Email
- Online chat (Virtual Reference)
- **4.4 Tools Used in Reference Service**
- Dictionaries
- Encyclopedias
- Directories
- Handbooks
- Databases
- **4.5 Importance of Reference Service**
- Helps users find correct information
- Promotes effective use of library
- Improves user satisfaction
- Supports learning and research

Email (Electronic Mail)

- **1. Email (Electronic Mail)**
- **Definition**
- Email is an **asynchronous electronic communication system** that allows users to send, receive, and store messages over a network (usually the Internet).
- **Key Features**
- Asynchronous (sender and receiver need not be online simultaneously)
- Supports text, attachments (documents, images, audio, video)
- Messages are stored and retrievable
- Uses protocols like **SMTP, POP3, and IMAP**
- **Uses in Library & Information Services**
- Reference services (Ask-a-Librarian)
- Official communication with users and staff
- Document delivery and interlibrary loan notices
- User education and outreach
- **Advantages**
- Cost-effective
- Creates a written record
- Accessible globally
- Suitable for formal communication

Chat Services

- **2. Chat Services**
- **Definition**
- Chat services enable **real-time, text-based communication** between two or more users over the Internet.
- **Characteristics**
- Synchronous communication
- Immediate response
- Usually short, informal messages
- Can be one-to-one or group-based
- **Role in Libraries**
- Virtual reference services
- Real-time user assistance
- Online help desks
- Academic support services
- **Advantages**
- Immediate feedback
- User-friendly
- Enhances user satisfaction
- Useful for quick queries

Instant Messaging (IM)

- **3. Instant Messaging (IM)**
- **Definition**
- Instant Messaging is a form of **real-time digital communication** that allows users to exchange messages instantly via dedicated applications.
- **Examples**
- WhatsApp
- Telegram
- Microsoft Teams
- Slack
- **Features**
- Real-time text communication
- Presence indicators (online/offline status)
- File sharing
- Voice and video calling (in many platforms)
- **Use in Information Services**
- Internal library staff communication
- Group collaboration
- Academic discussion groups
- Quick information exchange
- **Advantages**
- Fast and interactive
- Informal and user-friendly
- Supports multimedia
- Encourages collaboration

Content Alert Service

- **. Content Alert Service**
- **Definition**
- A Content Alert Service is a **current awareness service** that notifies users automatically about **new or updated information** matching their interests.
- **Types of Alerts**
- Email alerts
- RSS feeds
- SMS notifications
- App notifications
- **Sources of Content Alerts**
- Library databases (Scopus, Web of Science)
- Journals and publishers
- Library OPACs
- News portals
- **Importance in Library Science**
- Supports research and scholarship
- Keeps users updated on latest publications
- Saves time in information searching
- Enhances selective dissemination of information (SDI)
- **Advantages**
- Personalized information delivery
- Timely updates
- Improves research efficiency

- **RFID Technology**
- **1. Meaning of RFID Technology**
- RFID (Radio Frequency Identification) is a **wireless technology** used to **identify and track objects** using radio waves. In libraries, it is used to manage books and other materials efficiently.
- **2. Main Components of RFID**
- **(a) RFID Tag**
- A small chip attached to library items
- Stores item identification data
- **(b) RFID Reader**
- Device that reads information from the tag
- Placed at circulation desks and security gates
- **(c) Antenna**
- Helps in transmitting radio signals between tag and reader
- **d) Library Software**
- Connects RFID system with library management system

- **3. Working of RFID Technology**
- RFID reader sends radio signals
- Tag receives the signal and sends back stored data
- System processes data for issue, return, or security checking
- **Applications of RFID in Libraries**
- Book issue and return
- Self-check kiosks
- Theft detection
- Inventory and shelf management
- Tracking lost or misplaced items
- **6. Advantages of RFID Technology**
- Fast and accurate circulation
- Saves staff time
- Improves security
- Multiple items scanned at once
- User-friendly service
- **Limitations of RFID Technology**
- High installation cost
- Requires technical knowledge
- Privacy and data security issues
- Tag damage or signal interference

- **Importance of RFID in Modern Libraries**
- Supports library automation
- Enhances service quality
- Helps develop smart and digital libraries