TECHNOLOGY AND SERVICES FOR LIBRARY AUTOMATION

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ABSTRACT

This presentation will explore the current state of Library Automation Systems. Including in the presentation will be a brief introduction to what Open Source Software is - and what some of the benefits of using Open Source Software in libraries. The pros and cons of why a library would want to use an Open Source library automation system instead of a commercial automation product will be discussed. An introduction to a number of current Open Source Library Automation technology and service will be given. The technologies that will be covered include Koha, CAS, and SDI.

KEYWORD : Library automation, cataloging, library software, OPAC, barcode, Koha..

INTRODUCTION

Latest advance in the field of information technology have compelled libraries’ to embrace automation as the facilities provide by automated libraries go far beyond the activities of traditional libraries. In developed countries computerization of libraries started in 1940. The first use of computers in library and information centers in India was reported in 1965 at INSDOC now know as national institute of science communication and information resource.

Library automation gathered momentum 1990 driven by the sharply dwindling price of hardware, increasing available of library software packages and also ever increasing enthusiasm on the part of library professionals to embrace information technology along with other factor .in any library automation system, cataloguing module is an important module as it caters to the needs of data base creation of library holding.
ABOUT THIS PRESENTATION

- Library Automation
- History, Need, Advantages, Disadvantages
- Planning of Library Automation
- Modules
- Technologies for Check In\OUT
- Packages Available
- Conclusion

1. LIBRARY AUTOMATION

Library automation is the general term for information and communications technologies (ICT) that are used to replace manual systems in the library using the machineries for easily working and saving the human power and time.

2. HISTORY LIBRARY AUTOMATION

Over a period of thirty years, goals for library automation have shifted from an emphasis on local concerns to an emphasis on global concerns. This gold evolved through three incremental phases- efficiently of internal operations, access to local resources outside the Library – before reaching the present stage of addressing interoperability among system and service. This new technological environment enables libraries to serve a global in client tele information infrastructure.

First generation:
- Little integration between modules
- Mainly Circulation & Cataloguing
- Specific to Hardware & OS

Second generation:
- Various platforms (UNIX and DOS)
- Functions are Command driven or Menu based

Third generation:
- Fully Integrated Modules (using relational database structures)
- Various Standards
- GUI Based features

Fourth generation:
- Client-server architecture
- Access to other servers over the Networks
- Allows to access multiple sources
2.1 DEVELOPMENT OF LIBRARY AUTOMATION

- 1930s punch card for circulation (IBM)
- 1950 info & docu.Center America
- 1961 KWIC H.P Luhan IBM
- 1665 Indian science Abstract: AUTHOR INDEX BY insdoc
- 1966 MARC-1 and in 1968 it was converted in MARC-11 by Henriette Avram
- 1970s many library network establish in India.

3. NEED FOR AUTOMATION

- User Time (Dr. SRR’s fourth law)
- Man power.
- Resource Sharing.
- (RFID)Security.
- Report Management.

4. ADVANTAGES OF LIBRARY AUTOMATION

- Improve the quality, speed and effectiveness of services.
- Relieve professional staff from clerical work.
- Improve access to remote users.
- Facilitate wider dissemination of information products and services.
- Resource-sharing among other library networks.
- (Union Catalogues).
- Enable rapid communication with other libraries.
- Improve the management of physical and financial resources.

5. DISADVANTAGES OF LIBRARY AUTOMATION

- Initial and recurring expenses
- Continuous staff training
- Hardware and Software Obsolescence

6. PLANNING FOR AUTOMATION

- Needs Mapping
- Best possible package
- Staff Involvement
- Budget (Purchase, operation, maintenance, etc.,)
- Hardware Requirement (Client/ Server, Printers, etc)
7. SELECTING AUTOMATION PACKAGE

- User friendly
- Popularity of a package
- Well designed screens, logically arranged functions with extensive help messages
- Minimal training
- Multi-user and unlimited user access
- Multilingual & Multimedia
- Support internationally known standards (MARC, AACR-2, Dublin core, Z.39 etc)
- Training and Support (E-mail, Discussion Forums)

8. STRUCTURE OF AUTOMATED LIBRARY

![Figure 1: structure of automated library]

9. MODULES

- Acquisition
- Cataloguing
- Circulation
- Serial Control
- Administration
- OPAC
- User Services - SDI, CAS
10. FUNCTIONALITIES OF ACQUISITION

Automates the acquisition process - ordering, receiving, claiming materials from suppliers, and returns, and cancellations of materials are used to maintain statistics, and in some cases manage accounting activities it can be done online if system is linked to an external network.

- Suggestions management
- Ordering, cancellation and reminders
- Receiving
- Budget Management
- Master file management such as currency table, vendors, publishers, etc

11. FUNCTIONALITIES OF CATALOGING

A library catalog is a register of all bibliographic items found in group of libraries, such as a network of libraries at several locations. A bibliographic item can be any information entity (e.g., books, computer files, graphics, regalia, cartographic materials, etc.) that is considered group of library materials and linked from the catalog as far as it is relevant to the catalog and to the users (patrons) of the library.

- Creation, Storage, Retrieval and management of bibliographic records and indexes
- Import/Export facility

12. FUNCTIONALITIES OF CIRCULATION

Library circulation or library lending comprises the activities around the lending of library books and other material to users of a lending library. A circulation or lending department is one of the key departments of a library.

The main public service point is the circulation desk or loans desk, usually found near the main entrance of a library. It provides lending services and facilities for return of loaned items. Renewal of materials and payment of fines are also handled at the circulation desk. Circulation staff may provide basic search and reference services, though more in-depth questions are usually referred to reference librarians at the library reference desk. The circulation desk is in most cases staffed by library aides instead of professional librarians.

- Issue, Return, Renewal of Documents Recall, Reservation, Reservation Cancellation
- Reminders (Manually, e-mail)
- Reports
- Documents - Issued/Returned (Period, Subject, doc type, etc.,)
13. FUNCTIONALITIES OF SERIAL CONTROL
- Subscription of New Journals
- Renewal of Journals
- Invoice Processing
- Payments
- Receipts of New Issues
- Reminders for missing issues
- Browsing Issues
- Reports Generation

14. FUNCTIONALITIES OF OPAC
- Simple & Advanced Searching
- Boolean search
- Field Based Searching (Author, Subject, Source, etc.,)
- Browsing
- Field Based
- Hierarchical
- Personalized OPAC (My opac)
- SDI, CAS, Reservation, DDS, Outstanding Doc’s, Subject list, etc.,

15. FUNCTIONALITIES OF ADMINISTRATION
- User ID & Encrypted Password Protection
- Module Level Security
- Budget Management
- Stock Verification
- Master file Updation
- Fixing Due dates, Overdue Charges etc.
- Eligibility Holiday Maintenance
- Feedback
16. ADMINISTRATION

- Various Reports
- New Additions, Catalogue (Main/Author/Title)
- Accession Register/Bibliography
- List of books by Author/Title/Publisher/Year
- Subject/Call Number (by any order)
- Books by Unique Titles, Frequently issued books
- Books by - Subject wise
- Frequently Accessed Books
- Books Issued/Returned/Reserved/Reminder
- Receipt for Fine Amount/Deposit/Loss of Book, etc
- List (User/Publisher/Supplier/Departments)
- No-Due certificates
- Stock verification Report
- Budget Details, Orders
- Journal List (Foreign/Payment/Gratis/Exchange)
- Journal Subscription /Order Report/Missing Issues

16.1 LIBRARY RFID MANAGEMENT ADMINISTRATION SYSTEM

Figure 3: library Rfid management administration system

17. TECHNOLOGIES CHECK IN/OUT

- Bar Code System
- RFID System
18. COMPARISON OF RFID & BAR CODING

<table>
<thead>
<tr>
<th>Type</th>
<th>RFID</th>
<th>BAR CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visibility</td>
<td>Works in any direction, does not require line of sight</td>
<td>Directional, requires line of sight</td>
</tr>
<tr>
<td>Read range</td>
<td>Between 4 and 80 cm (1.5-31 inches) using passive tags. Up to 100 meters using active tags</td>
<td>Typically 15–30 cm</td>
</tr>
<tr>
<td>Read rate</td>
<td>Up to 200 tags per second</td>
<td>Limited to rate at which objects can be physically locate in front of Scanner None</td>
</tr>
<tr>
<td>Data Storage</td>
<td>Up to 4 KB using passive tags and 32KB using active tags withstands harsh environments</td>
<td>Prone to scratching and tearing</td>
</tr>
<tr>
<td>Security</td>
<td>Difficult to replicate (95% security)</td>
<td>Simple to Replicate</td>
</tr>
</tbody>
</table>

Table 1: comparison of Rfid & bar coding

18.1 BAR CODING

In an automated environment every document should be unique and searchable. It is done through bar coding. Bar coding facilitates the searching, circulation and systematic shelving of the concerned document. After entering all the details regarding the documents into the database, barcodes are printed on adhesive labels according to the accession number of the document. For this process we used one barcode software and laser printer. Figure 3

![Barcode Printer](image1)

![Labels (Numeric, Alphabetic, Alphanumeric)](image2)

![ Barcode Scanner](image3)

Figure 4: bar coding

18.2 LABELLING

The barcode label was pasted on the lower bottom of the title page of the book. This has been read by the barcode reader during circulation and stock verification. The second label that pasted on the lower bottom side of the spine of the book is called spine label. It contains Call number (class number and book number), Accession number and library code. After pasting, these labels were covered with cello tapes for more protection Figure 4
19.1 SIX SENTENCE ABOUT RFID FOR LIBRARY

- RFID tags replace both the EM security strips and Barcode.
- Simplify patron self check-out / check-in.
- Ability to handle material without exception for video and audio tapes.
- Radio Frequency anti-theft detection is innovative and safe.
- High-speed inventory and identify items which are out of proper order.
- Long-term development guarantee when using Open Standard.

19.2 WORKFLOW OF RFID SYSTEM

Figure 5: workflow of Rfid system

19.3 RFID TECHNOLOGY FOR LIBRARIES

- RFID (Radio Frequency Identification) is the latest technology to be used in library the detection workflow of Rfid system Figure 5 Unlike EM (Electro-Mechanical) and RF (Radio Frequency) systems, which have been used in libraries for decades, RFID-based systems move beyond security to become tracking systems that combine security with more efficient tracking of materials throughout the library, including easier and faster charge and discharge, inventoring, and materials handling.
- The targets used in RFID systems can replace both EM or RF theft detection targets and barcodes.
RFID is a combination of radio-frequency-based technology and microchip technology. Figure 6 The information contained on microchips in the tags affixed to library materials is read using radio frequency technology regardless of item orientation or alignment (i.e., the technology does not require line-of-sight or a fixed plane to read tags as do traditional theft detection systems) and distance from the item is not a critical factor except in the case of extra-wide exit gates. The corridors at the building exit(s) can be as wide as four feet because the tags can be read at a distance of up to two feet by each of two parallel exit sensors.

Figure 6: Rfid technology

20. ADVANTAGES & DISADVANTAGES OF RFID

20.1 ADVANTAGES
- Fast track Circulation Operation
- Self check In/Out by users
- Security
- Tag Life
- Shelf Management becomes easier
- Stock verification becomes Faster and Easier
20.2 DISADVANTAGES

- High Cost
- Removal of exposed tags by users
- Reader Collisions & Tag Collisions (techniques & algorithms to solve)

21. KOHA

- Open source ILS
- Available at http://www.koha.org
- Mailing list at http://koha.org/mailing/
- Available for Windows & Linux
- Easy to install and maintain
- A simple web based interface for Users and Library staff
- Search interface is easily customizable
- Complaint to all standards

22. Developed by INFLIBNET

- Windows based user friendly software
- Well designed screens, logically arranged functions with extensive help messages.
- Based on client server architecture
- Does not need extensive training
- Multi-user access
- Provides facility to create, view records in regional languages (multilingual)
- Supports internationally known standards CCF, AACR-2 etc.
- Nominal price   (Includes Installation, onsite training, one year support, free future updates, multilingual software, manuals)

23. LIBSUITE

- Commercial Software developed by Soft-Aid
- Web enabled
- Runs on Windows platform
- Based on client server architecture
- Personalized OPAC
- Supports article indexing, CAS, SDI
Powerful Search facilities
- Can attach digital documents (images, audio, video, etc)

### 24. OPEN SOURCE SOFTWARE
- Linux
- Apache
- MySQL
- Perl / PHP
- LAMP
- Library Automation
- System / Library Management System (LMS)

### CONCLUSION
For the successful implementation of an integrated library system all key factors must be in place: support from administration, staff competence, consideration of user requirements, presence of the infrastructure (hardware, software, network), available data, excellent managerial skill from the coordinator of the project.

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