LIBRARY AUTOMATION

DISSERTATION SUBMITTED

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CHAPTER I

Introduction of Library Automation

Library automation was introduced in 1970's and it was first introduced by D.S.Harder in 1936. Library automation is give up to date method to help libraries and library patrons for successfully use of library resources. Automation is machineries' process for easily work or save the time of human power. The main purpose of library automation is to allow library staff and librarians to contribute meaningfully spread of knowledge and information. Libraries used a typewriter, and card catalogues for assigned a due dates. And it provides proper information for users at a short time. Library automation means it has to planning for updating the new technologies in regularly, by keeping database, converge new technologies on information storage, and retrieve the housekeeping operations.

It defined traditional library activities such as acquisition, cataloguing, circulation and serial control and is also defined 'integrated system' by using common database. ICT is a generic term of library automation to perform physical processes of libraries. The local area network is not applied in library automation. Interlinked module of library automation system is liable for different operational systems and it performs all basic functions of library.

Computerized library system is recognized as integrated library automation. Modern Library is always available through internet to retrieve documents entry activities. Library perform number of basic operations like '' housekeeping operation' 'and also cover basic tools. The facilities of library is most accurate and productivity to utilize automation. Technology and economic development is severally changed unless fundamental changes. The library field development is the idea of library automation.

In ICT of library automation is the terms of gathering, association and services. Is the application of computer and utilization of products and services in different library processes and function of various services and output manufacture products. The implement of library automation are generally converting the existing system and mechanization system. The organizations are needs to complete the needs and requirements charge. The library automation effective work depends on proper development and execution.

Is usually distinctive field such as automatic indexing, retrieval, abstracting and recorded analysis, and major role like telecommunication and reprography equipment because it support library automation .It is the process of self-activating, self-controlling and automatic. The process is characterized by high speed statement and microelectronic documents. The internet is global stage and source of information methods and library services.

1.1 Definition of library automation

The oxford English dictionary defines automation as "application of automatic control to any branch of industry or science by extension, the use of electronic or mechanical devices to replace human labour".

ALA glossary of library and information science defines automation as "the performance of an operation, a series of operation or a process by self-activating, self-controlling, or automatic means. Automation implies use of automatic data processing equipment such as a computer or other labour saving devices".

1.2 Need and purposed of library automation

1. The IT increased productivity of library staff. It relieves professional staff from clerical task so that they can be successfully used for user oriented library services.

2. It improves quality of services rendered by the library.
3. Automation help library staff member to check the status of an order without making an enquiry or without maintaining duplicate files. A user can check to see if a book available on the shelf of the library or if a book is out on loan.
4. The library staff, specially the younger ones, use of computer interesting and exciting. Use of computers can be a motivating factor for several library staff.
5. The application of information technology in libraries results in increased operational efficacy. It ensures ease of functioning accuracy and economy in human labour with greater sped.

1.3 Feature /characteristic of library automation

1. The process/operation are carried out automatically.
2. Reduced or avoid human action and thus save labour and time.
3. It speed up efficiency and speed in operation.
4. Immediate answer to multiple quarries.
5. User friendly system
6. Availability of information
7. Accuracy in work
8. It is helpful to providing library services
9. Avoid duplication of information
10. It is electronic based activity which is carried out by human being's
11. Trained staff

1.4 Objective:-

- ✓ Information should be providing quicker rate.
- ✓ New library services and human resource should be developing.
- ✓ Appropriateness of networking and resource sharing.

- ✓ Well storage and retrieval system could be established.
- ✓ Time and human power saving with qualitative services.
- ✓ Reports and correspondence should be prepared.
- ✓ Suitability of library cooperation.
- ✓ Searching of documents, issuing, return and renew the books with the help of OPAC are the most dominant tool of library automation.
- ✓ It should be preserve bibliographic proceedings of all materials.
- ✓ Sharing resources with the help of library network and provide excellence information.

1.5 Functions of library automation

The main function of library automation is:-

1. **Cataloguing:-**

Cataloguing is simplified and coherence of data. The fields can contain several characters and some contain images, such as documents cover and photographs readers. The library catalogue is folder to comprise the record by describing books and materials in library collections.

2. **Subject headings :-**

Content of your documents is analyzed by measured subject headings. One subject heading is refer like synonyms and similar concept that means authority list can be printed.

3. **Searches:-**

It gives functions as like

- o Books by given author
- o Exact subject on non-fiction book
- o Made acquisition in last three months

- Give publisher DVD on given date.
- Specific subject published by journals on press articles.
- Subscription regeneration should be received for readers and live in district.
- One word title only remembers for novels.

4. **Search for public:-**

Public search is considered all types of readers those who not use computer .this system is simple and organized screens, clear explanation of search and non-essential choices.

5. **Digital titles :-**

It like websites, desktop documents, images, sound files and etc. these are associated with title records. Incomes the reader click on link is connect with digital resources, which will appear on screen.

6. **Settings :-**

Specific needs are types of documents, loan duration, accessing, values, automatic numbering, and many more set by checkboxes, or radio buttons. No need to enter formulas or modify the unclear files. Means most of the choices setup can be modified later on.

7. **Classification :-**

The library classification is managed directly with application. We can easily add, delete, modify whenever we needed, the software come with universal decimal classification (UDC).

8. **Series :-**

Dedicate index managed with publisher series. But you can ensure that are no double entries. The lists of titles are easily allowed to series, in order to classify potential gaps.

9. **Printing :-**

Printing are allowed for new acquisitions and bibliographic list, barcode labels, title of number loan, series heading, class mark and record list, addresses labels and reader list.

10. **Addresses :-**

Contacts are listed in address database. Fields allow all necessary information such as email address, telephone number, category, gender and data used for statistics. You can simply send email to your readers and need to inform that the library is organized or change in opening hours. The applications can systematize subscription management.

11. **Circulation module :-**

This module determines materials like returned, makes to remind the notice, when overdue and keep the financial duties.

1.6 Advantages / dis-advantages

Advantages of library automation

1. Library automation reduces the workload for library staff in terms of cataloguing, circulation and acquisitions. It's time to provide higher quality service to library patrons. It will help users for finding the library materials such as books and reference journals become easier and save the time.

2. With the use of scanning technology the barcodes on book can be scanned directly with the help of catalogue database. It also helps quickly to identify the stock when budgeting the new library materials. It develop the human resource.
3. Library automation is increased building and maintenance cost, for finding power consumption to increase heats and air condition needs. Most of libraries are old to remodel the work such as wiring, heating and cooling ducts will support the automation.
4. With the use of computer the better quality performance should be possible to improve services to the users. And superb control over circulation.
5. Computer and advanced technologies are possible to enhance services in diverse industries including libraries. With the help of library automation resources cam be computerized, spreadsheets, and database can be automated.
6. The planning of library automation includes how automation will help library and fit into the library technology plan and also fit into budget.
7. Example: - patrons check their own books by swiping the library card and scanning the book barcode for machine. Patron no needs people to help library materials but computer provide the information.
8. Bibliographic example like title, edition, publisher, ISBN, this data used for retrieving, cataloguing and circulation.

1.7Dis-advantages of library automation

1. **Employee cut-backs:-**

With the new automation system in libraries, there is less funding left in budget for employees. Also fewer employees are needed.

Example you can check book or swiping your library card and scan your book across the book pad. So users can handle a terminal system but harder and harder

find the people especially the public libraries, of whom you ask maybe not-fully-formed questions or common inquiry.

2. **Library closings and hour shortage :-**

Most of the libraries are closed their door for permanently or opening later. Due to new automation system library closing means job closing, less children story hours, book club closing, less story hours and cancel schools reading clubs. Libraries without automation are simply less expensive to run. The small libraries are not afforded to pay automation costs on their own.

3. **Time consuming**:-Automated system good in regular basis for time consuming, selecting, plan, and long term commitment and implement the system need.
4. **Book budget:-**

   The higher budget being spent on automated library system means less money is being spent on books. Library books have shelf life and accordingly kept number of times to check out. The new technology is rapidly changing in which scholars do their work but not intellectually desirable.
5. **Rising building and maintenance cost :-**

Findarticles.com states power consumption and changes in heating and air condition needs are planned for automated system is installed. Machines chain with noise and body heat for people. Cost more than libraries have been earlier paying for building maintenance and power cost.

1.8 Requirement for library automation

The basic requirements for any library automation programmers are software, hardware, manpower and finance.

1. **Hardware**

Hardware is another important element of library automation programme number of product and manufacturers are available for this purpose. The hardware formation mainly depends upon the software. There are two types of PCs re available in the market such as :-

- ✓ The branded PCs from reputed firms like HP, Compaq, IBM etc.
- ✓ The assembled PC by commercial firms.

Computer, server or on cloud:- cloud server price may be varying from provider to provider and mainly based on the following i.e. storage capacity RAM , operating systems ,supporting software's of library automation software.

2. **Peripherals ;-**

1. Keyboard and mouse: - these are common as minimum needs.
2. Printer:- any laser printer to print circulation slips and other library use
3. Scanner :-basic model scanner is required to scan book cover images and library user photographs to upload into library automation software
4. Barcode printer:- barcodes are required as per code 39 standards for books and user library cards. Required barcode printer to generate and to print. Numbers of open source barcode generators are available to generate required barcodes. Some are single barcode generators, some are multiple barcode generators.
3. **Barcode scanner: -** it is required or circulation and stock verification. Using barcode scanner we can come out from the wrong checks outs and check in. it save the time of manpower and get the exact figure in stock verification by using barcode scanner.

4. **Software :-**

The good functioning of library automation mostly depends upon the nature of the software used for the purpose. The different types of library software are available such as

- In house development library software or custom designed.
- Software package developed by commercial agencies, organization and institution.
- Cooperative venture

Therefore good selection of library software is one of the most important function of library automation programme. Every software has its own advantages and disadvantages. But should be selected keeping in mind the need of the organization.

5. **Networking; -** networking is required to interconnect the computer, computer peripherals, switches to share the information. The intension of network is to distribute information among the interconnected users. The network mainly consist of three component i.e. transmission media, mechanism of control and interface unit to the network. Type o network is dependents on requirement of the users or objective of the organization to provide the database access to the users. Local area network (LAN) is useful to access the library database within the organization. Wide area network (WAN) is required to provide the access facility to outside of the organization
6. **Manpower**

For running any programme including library automation programme, trained manpower are required. The library staff should be trained properly with essential computer knowledge for running the automation programme successful. Some software package manufacturers are giving onsite training to the staff at the

installation time of software. The user also need to be trained about OPAC system.

7. **Finance** :- Finance is the most important component for any programme. The finance of any automation programme includes both installation and ongoing expenditures which includes maintenance, stationeries etc. Budget approvals to be taken from the management by submitting the library automation project proposal.
8. **Library collection:** - the size of a library collection will have an overall effect on the system selected for all other services of a library. The kind of document backup and storage device required will depend largely on the sizes of its collection.
9. **Number of users;-** the library has an option of going in for a few standalone systems I they are catering to a limited number of users in a small setup, or connecting standalone into a network or if the users are distributed , say within a campus, and need to access the library almost 4 hours then the library may decide to go in for a server with terminal distributed around the campus.
10. **Number of transactions:-** the more number of transaction expected in a day, the higher should be the RAM speed and the speed of the backup storage devices. Transaction could be records of books processed, number of serials registered, and number of books/periodical issued, reminders to borrowers etc. so that the system will act as a supporting and speed enhancing device rather than hindering the activities.
11. **Types of services offered:-** the library need to identified the services it is planning to provide. This will have a direct impact on the system to be selected.

1.9 Library automation process

The main steps of library automation process are:-

- **Step 1:- prepare for automation**

✓ Appraisal of current status :-

Statistics like total number of library stock, accession material, issue, return, repetitive activities, services and etc. to find out the present status of library and user's facing a problem to classify.

✓ Need assessment :-

Library activities are issue or return a book, so the librarians not get time to increase the services, the automation was necessary. Annual stock verification and monthly library statistics were not up to the morals. Cataloguing schemes and classification were no standard, users go through all collection to find needed one. No system to find book was to be issued or existent.

✓ Evaluation of cost :-

Cost contain in library activity was greater in case of manual system. The cost done by librarian in manual system is for routine activities will become less and developed a programmed and modify information services. And also strong administrative backup is essential for development.

✓ Budget allocation :-

Initial investment needs library automation, the fund process was kept in annual budget and library allocation. Since investment will not routine the book and periodical accession in coming years.

- **Step 2 :- software and hardware system selection**

The integrated library management software is very important. Is mainly depending on system software.

✓ Criteria selection :-

It must be user friendly, portability later service and cost of correct documentations.

✓ Local software :-

Most of the libraries are using this software. The price was sensible and easy to use and also search facilities are helpful for students.

✓ Hardware :-

Computer system is used as server and OPAC for user. Printer used for labels and barcode reader choice as input device for reading books and card identify. Other materials like self-adhesive label and cello tapes were obtained.

- **Step 3 :- prepare collection for automation system**

All periodicals were included for selection and encyclopedias multimedia CD-ROMs were select for processes.

- **Step 4 :- implement automated system**

✓ The process of bibliographic and documentary stock into machine readable form is known as retrospective conversion. Bibliographic data entry and physical process comprises of technical processing. The steps of data entry are :-

1. Classification :

Classifications are classified according to subject of their content. This system is used and followed by Dewey decimal classification. The subjects are classified into ten divisions (first summary). Each division classified into ten subdivisions according to depth of subjects (second and third summaries) the class number CBSC is strategies for libraries are used in reference.

2. Cataloguing :-

Software has a facility of printing card catalogue, but not raised any need of that, since we are used online public access catalogue (OPAC).

3. Indexing :-

All book entries fields are indexed and searchable, incase periodical indexing terms are feed into database.

4. Barcoding :-

Every document are unique is done through coding. The searching, circulation and systematic shelving are barcode facility. After entering all documents on database, barcode are printed on adhesive labels according to accession number of document. For this is used for barcode software and laser printer.

5. Labeling :-

The barcode label was pasted on lower button of title page of book. is used to read by barcode reader during circulation and stock verification.

The second label is past on lower button side back of book is called spine label. It contains call number, accession number and library code. It covers with cello tapes for protection.

6. **Shelf arrangement :-**

Book were arrange on shelves in stack room according to call number , if more than one book are existing with same call number, means they are arranged alphabetical order within the call number.

- Database of users :-

Users using library management software was acute. Like book which has unique accession number, a member should have his/her unique identification. The only unique number for students was admission number, it was nominated.

- Students/staff identity card :-

The school identity cards are used as library membership cards. One side of card contains barcode admission number of student along with instructions.

On staff identity cards, serial number of staff has been bar-coded with his/her personal particulars.

- Circulation :-

The user has brought identity card to the library at time of issue, return, renewal and difficulties.

1. Issue/return of book :-

When user comes on circulation counter along with book, the barcode reader read his/her identity card. It will show the details of that member such as name, div, and class, and category, book are issued and return along with dates. The details are come automatically by use of barcode reader by reading the barcode label on title page of book.

When book is return, barcode label read by barcode reader and details such as due date, fine etc. librarian can return a book by selecting graphic options.

2. Renewal and reservation :-

Give accession number at circulation section, users can renew the book for extended period. Books can be kept by submitting identity cards.

3. Fine :-

The ‘loan period’ should fix beginning of operation. The system will automatically give overdue facts, when member return the book.

- Serial control :-

The details of library periodical entered into database such as title, periodicity, subject, print and vol / issue member, date of publication and date of receipt. The system will automatically create the missing issues, so the librarian can send reminders.

- Multimedia :-

Collection is CDs, ACDs, VCDs, DVDs etc. title, producer, stamp, subject, language, format and duration of media are arrived. Barcode labels are passed on CD-ROMs so they can disseminate.

- Library statistics :-

Library statistics show functional stock and services. The main statistics systems are:-

- Monthly stock details

- List of new addition

- Student and staff member information

- Circulation details are Weekly/Monthly

- renew, overdue, fine and reservation details

- Details of written documents

- Stock verification.
- The annual stock verification can be done comfort by reading the barcodes of the books and equal with basic record.

    - **Step 5 :- Networking**

The main system of software was overloaded and data entry has taken place in server. The remaining library system including OPACs and computer system were networked nearby. The maintenance of network is essential and new documents are apprising database.

- **Step 6 :- OPAC (online public access catalogue)**

OPAC is the user interface of automated system. The user gets all information for holdings the library.

✓ Searching OPAC

This OPAC is easy, the user have to select the document. This may be book, journal or multimedia from" document "field.

✓ Finding the book work flow

The user note down call number of required book from the database .The books are shelved according to their call numbers. Shelf guides are help to find shelf number. From the shelf user picks the book and bring into circulation counter for issue.

✓ Back- up :-

The database are copied CD-ROMs to avoid unexpected system crashes and data victims.

- **Step 7 :- staff training and user education**

The library should be well trained in management and maintenance of system. The training software and modernize according to changing user needs and technology. Automated library system training session is OPAC search, to finding books, and etc. skill development set can be organized by library periods.

- **Step 8 :- Evaluation**

The system evaluate it currency and success periodically. User studies are conduct through effectiveness, the observation techniques are to be used. The limitations should be identify and glade measures be taken, suggestion book will keep in library to rapid users opinions.

- **Step 9 :- planning for future**

According to S.R. Ranganathan library is a growing organism. The technologies are changing in field of information storage and retrieval, the users are also changing. There should be strategic for library programs will incorporate the upcoming needs.

1.10 Services of library automation

Library automation is a term used to signify the various activities related to storage, update, sites, acquisitions, processing, broadcasting ,reproducing or transmission or etc., it improve the quality of products and services of library. It develops to save the manpower to avoid some routines, and tasks such as sorting, typing, and duplication checking etc.

The main activities and services of library automation are:-

1. **Information resource building :-**

The books, article, audio-visual, electronic materials such as CD-ROMs and so on. The specific function of acquisition process and section of library collection are:-

- The vendor selection
- Records of items
- Record of receive and non-receive items
- Duplication and library holding checking
- Make payment after processing
- Item verification with files
- Checking overdue order
- Prepare budget and keep account
- Cancellation of order list with terms and disorder of supply.

  The bibliographic database is the key activities of library automation. The computerized database has many advantages over search from catalogue by methods in terms of speed and accuracy. The libraries create for using database packages like CDS/ISIS.

2. **Data entry :-**

The data entry is essential as: - books, serials, CD-ROMs, floppies, gift items, maps, report, members and audio-visual.

3. **Classification and catalogue :-**

Catalogue includes record and display the facts holding of library. Computer are used for production, maintenance and updating of catalogue. The input data is still on catalogue work. Bibliographic details are assembled from sources and acquisition systems. The master and temporary files are calculating the records, because of printing master file is done.

After input records, computer performs simple tests on record structure and error can be checked. The basic records are CDS/ISIS is used; the data entry is humble

process. The listing of authors, subject, and key point's access can be created. The files and index help the computer search and show the record to specific enquiries are include:-

- Catalogue and production
- Online cataloguing
- Production of duplicate catalogue cards.
- Shorting and filing of cards.
- Preparation of authority file subject heading list.
- Generation of monthly accession list.
- Developed centralized and online cataloguing. The added entries are author, title and series.

4. Circulation :-

Circulation is the library service that most available to computerization. The advantage is issue and discharges the schedules; this is basic of any library.

Circulation system using computers have details of book issued and person borrowing it is entered on files. The daily check files will identify what books are due or overdue and noticed can be send to the users who have borrowed them.

The circulation process is computerized system depends on giving identification code to books and users. Accession number or call number can be used for unique identification key for a book. The identify codes are:-

Issue, return, renews, and registration of documents and produce slip to proof.

- Registration and cancellation and time for membership
- Charges for lost, late, binding and penalty slip
- Inter library loan
- Barcode system
- Preservation of circulation statistics

- Circulation of report figures.

5. **Serial control :-**

Serial control is the use of computer for difficult tasks of housekeeping. This is because literally impulsive serial publication, it includes:-

- Receipt and apprising of data
- Vital serials data
- Order list of new serials
- Receipt to vendors and editors
- Mode of payment, prepare for payment
- Prepare list of additions, gone and cancelled serials.
- Renewal and cancellation of current donations
- Binding control
- Prepare budget and preserve account statistics such as binding.
- Follow-up missing matters
- Accession register to certain serials.

6. **Documentation and allied services:-** the following are

- Indexing and abstracting of macro and micro documents
- Bibliographic control
- Current awareness service
- Gathering of union catalogue
- Literature search
- Newspaper clippings
- Choosy dissemination of information
- Accumulation of union catalogue

7. **Information retrieval :-**

Users can search database through terms of author, subject or title, which are using into Boolean operators (AND, OR, NOT). The SDI, Current awareness service and retrospective searches are services where the computer abilities can be used. Computer can be used formats of entries in index and also makefor entries in index.

Keywords can be ensuing from bibliographic description or define the documents and put into formats. Fully computerized index can be done through statistical analysis and word frequency counts, provide text in machine readable form. It is containing:-

- Database creation and conservation, saving house as well as external databases.
- (Issue, reserved, lost, overdue and so on) membership, inter library loan, penalty charges, periodicals, newspaper clippings, reports and etc.
- Search and print out exact necessities
- According alphabetically, subject-wise, members-wise, keywords such as title, call number, and version.

8. **Current awareness service**

The service have various forms like title, present content list, abstracting and indexing etc. in library we are using computers to providing CAS by sending email with help of database and CD-ROMs.

9. **Reference service :-**

The printed indexing, bibliographic sources, abstracting service and literature search are depends on reference service. The reference books are directories, dictionaries, Encyclopedia and so on.

Barriers of library automation:-

1. **Fear impact on employment:-**

Technical process, acquisition, circulation and reference service is the activities of library. On cataloguing module data is entered at the time of ordering, manpower is essential for cataloguing. The new services and analytical cataloguing is utilized for manpower. So there will be no influence for employees.

2. **Reflective conversion of data :-**

The analytical cataloguing and computerized automation can be consumed for conversion. This can be achieved in period bound plan.

3. **Library staff suffer extensive training :-**

The software develops for CDS/ISIS is available for INFLIBNET, INSDOC and DRTC. This training is operating for program and computer system. The librarian enough one or two weeks training, the users can allocation data to network environment and computer specialized maintenance is become easy.

4. **Technology could be too costly:-**

The hardware and software would be more expensive. The catalogue system is a more important activity of library. INFLIBNET developed public domain library software ILMS which suitable for DOS and UNIX. UNESCO could be developed PC software like CDS/ISIS and low price in developed country. The accessories like printers and etc. Have become inexpensive and reasonable.

5. **Lack of management support and due to budget limitations:-**

The support is not enough to barriers for development of library. Librarian takes more effort in substantial the management so the users will benefit by automation. And also communication plays a major role to convincing the more devotion.

CHAPTER II

2.1Modules of library automation

The basic modules of automated system are:-

1. Acquisition
2. Circulation
3. Cataloguing
4. Serial control
5. OPAC

1. Acquisition module :-

The acquisition is to manage and control the expenditure of funds for gathering development of library and needs. Means acquisition process must be accurate, resourceful and reactive to demands of library users. The library acquisition is the responsibility of bibliographic resources like procurements, exchanges and assistances. The modules are including name and address of vendors, materials, delivery date, organization, delivery and quantity.

The module are provide like book selection, printing, email, reports, invoice processing, receipt and accession of documents and so on. The system are requires formation and preservation by using acquisition module and this system are fully integrated with components, Record of items and use of OPAC.

2. Circulation module :-

This module is consisting of charges, discharges, reservation, renewal, and records maintenance. The circulation systems are interface with user and information system with backup services like acquisition, cataloguing and serial control. The following modules are name of borrower and address, date borrowed, due date, ID card number and author/title of book.

This module involves function such as check-in; check-out, belated notices, reserves, fines, renewal and numerical reports. The technological device is computer, barcode, scanners and helps in performing repetitive operators are simply and quickly. Circulation module support barcodes to give entry of items for borrower. The system produce reports, printed documents, fine, notices, list of borrowers, missing items, and statistical reports.

3. **Cataloguing module :-**

This module requires card catalogue for entries of author, title, subject, series, year of publication etc. it perform various tasks such as catalogue using machine readable catalogue, editing, copying, saving and retrieve the catalogue records. When record is saved in catalogue than it automatically appears in OPACs, and record is also creating in circulation module.

Catalogue module is like updating and brings about bibliographic database of library. Library support online interface for catalogue records such as OCLC and CD-ROM products and it also field with MARK-21 code. The activities and services are:-

- create worksheet and catalogue records
- Providing for adding, improvement, removes bibliographic records.
- Generate current awareness service
- Printing of catalogue cards, barcode and so on.

4. **Serial control :-**

The way of serials can easily and successfully handle the SOUL with the help of serial control module. The following functions are:-

- Renewal and unique subscription
- Suggestions
- Binding management

- Reduction of issues arrival
- Expense like fund control
- Reminder generations
- Examine status of item

The factors may be support for administration, competency, staff, consideration of users requirement, (hardware, software) available data and skills. The following modules are issue number, volume number, date of publication and frequency.

5. **OPAC :- online public access catalogue**

Catalogue module is OPAC is what users to find and retrieve the information. OPAC is same to card catalogue, but provide advanced search features. The functions are title, author, subject and keyword, the Boolean operators are (AND,OR,NOT) hyperlink and wild appeal search and combine strategy. The library cannot have OPAC without automated system.

This system support character based video as OPAC, the OPAC workstations are windows based. With the help of OPAC users can easily find out the title of book, name, subject heading and also it provide total number of retrieve items. When records are not shown in OPAC that time OPAC display scrollable.

2.2 Library automation software packages

There are various library automation packages available in India and distributed through approved agents or value added reseller. The packages available are

1. **KOHA:-** KOHA is an integrated library management system that was originally develop by katipo communication limited of wellington, New Zealand for the horowhenua library trust (HLT), A regional library system located in Levin near Wellington. In 1999 Katipo proposed developing a new system for HLT using open source tools (Perl, MySQL, and Apache) that

would run under Linux and use Telnet to communicate with the branches. The software went in production on the January 3, 2000, and released under the GPL for public use in July 2000. There has been a high level of interest in KOHA internationally, and it is currently being used in New Zealand, Australia, Canada, United States, India, Thailand, United Kingdom, and France. Many of the libraries presently using KOHA are small and medium sized mainly school and special libraries. KOHA has just been implemented at the Nelsonville Public Library in Ohio. The KOHA project has attracted developers in a number of different countries, with release 1.2.2 being coordinated from Canada and the current stable release, 2.0.0 (available both for Linux and Windows), from France.

The major features of KOHA are:

General: free to download, no license fee, fast, web centric, fully customizable, environmentally friendly (one can recycle those old PCs), establishing an international community of users and developers giving libraries the freedom to do it themselves or work directly with the system builders, generating an international spirit of co-operation and collaboration, easy staff training, supports both Windows and Linux platforms, uses freeware companions.

Circulation: issues (including rentals), renewals, returns and fines. Uses barcode scanners or keyboard; can generate a list of over dues for a phone reminder system.

Acquisitions: multiple book budgets and suppliers, real time budget information. Catalogue updates fast and slick, support for MARC 21 and UNIMARC.

Searching by keyword, author, title, subject, class number or combinations, customise to suit need of individual library.

Memberships: - one-stop-shop with all member information on one page.

User driven reservation facility from OPAC interface (Do-it-yourself reserves, in the Library or via the Internet).

2. **AUTOLIB:** Autolib is fully integrated multi-user software on Windows Environment, designed to automate various activities of University Libraries, College Libraries, R&D Libraries, Public Libraries and Special Libraries. The software is developed by Auto Lib Software Systems, Chennai and the product range includes:

- MS-Access with Visual Basic Version
- MS-Access with Visual Basic & WEB Edition
- MS-SQL server with Visual Basic Version
- MS-SQL server with Visual Basic & WEB Edition
- MS-SQL server with Visual Basic

The LMS is module based system, designed and developed by a team of library and information specialists, system analysts, software professionals, network specialists and database designers.

The functional features of this LMS are as follows:

- Database Management – data entry/updating of database for user, author, publisher, supplier, member, book, journal issues and back volumes, article report, thesis, standard, non-book materials, budget, subject, department etc.
- OPAC – powerful and versatile search facility, Simple search for beginners, Query builders for advanced users, query windows for complicated search, boolean search, field level search (single field/multiple fields, author/title/keyword/subject, accession no/classification, journal name/article name etc.);
- Circulation – transaction, issue, return, renewal of books, journals, back volumes, recall, reservation, cancellation, reminders, reports.
- Serials Control – subscription of new journals, renewal of journals, receipts of new issues, reminders for missing issues, invoice processing, payments, browsing issues, reports generation.

- Acquisition Control – duplicate checking, indent processing for new books, book ordering, reminders, receipts of books, invoice processing, payment, budget Management.
- Digital Library Module – allows to catalogue multimedia digital resources such as text, images, audio file, video clippings, etc. Allows to catalogue based on Dublin Core standard, Allows to handle various file formats such as .bmp, .jpeg, pdf, .doc, .avi, etc.

3. **E-GRANTHALAYA:** This LMS is developed by National Informatics Centre (NIC), Bangalore centre to suit the requirements of small and medium sized libraries. It is an easy-to-use software package and supports all the routine library operations. The General and Special features of the LMS are as follows:
   - The package includes functional modules for administration, serials control, acquisition, circulation, OPAC, reports and index.
   - Generates customized reports and statistics of library usage.
   - OPAC allows simple and advance search options, supports web-enabled searching.
   - The package has bilingual capabilities and can be customized to suit all Indian languages supported by ISM 2000 developed by C-DAC, provides options to control access through login id and password and supports quit-in privileges for users and staff.
   - Supports both standalone and networked operation mode. Recommended server configuration is Pentium III processor, 128 MB RAM and 4.3 GB Hard disc.

4. **SOUL:** The story of SOUL (Software for University Libraries) started with the development of ILMS (Integrated Library Management Software) by

INFLIBNET in collaboration with DESIDOC. Two versions of ILMS (DOS and UNIX) were developed for university libraries in India. But with the introduction of GUI based system and other revolutionary changes in the field of computer software, INFLIBNET decided to develop a state-of-the art, user friendly, Window based system which will contain all the features/facilities available with other LMSs in the market. As a result INFLIBNET came out with a LMS called 'SOUL'.The package was first demonstrated in February 1999 during CALIBER-99 at Nagpur. SOUL uses RDBMS on Windows NT operating system as backend to store and retrieve data. The SOUL has six modules – Acquisition; Cataloguing; Circulation; Serial Control; OPAC; and Administration. The modules have further been divided into sub-modules to take care of various functions normally handled by the university libraries.

The features of SOUL are:

- Window based user friendly system with extensive help messages at affordable cost.
- Client-server architecture based system allowing scalability to users.
- Uses RDBMS to organise data.
- Multi-user software with no limitation for simultaneous access.
- User friendly OPAC with web access facility.
- Supports bibliographic standards like CCF and AACR II and ISO-2709 for export import facility.
- Provides facility to create, view, print records in regional languages.
- Supports LAN and WAN environment.
- Available in two versions – university library.

5. **LIBSYS:** LIBSYS is a fully integrated multi-user library management system based on client-server model and supports open system architecture,

web-based access and GUI.This indigenous LMS is designed and developed by LibSys Corporation, New Delhi. LIBSYS has seven basic modules – Acquisition; Cataloguing; Circulation; Serials; OPAC;Web-OPAC and Article indexing. The leading features of the different LIBSYS products such as LIBSYS 4.0, LS-Premia, LS-Digital, LSmart and LSEase are as follows:

- Based on client-server model and TCP/IP for communication and networking.
- Provides ANSI Z39.50 complaint web access for making the server accessible through Internet/Intranet.
- Supports web OPAC for accessing bibliographic databases through Internet/Intranet.
- Supports standard bibliographic formats like MARC 21, UNIMARC, CCF etc.
- Includes images and multimedia interfaces with LIBSYS search engine.
- Supports barcode technology for membership card production and circulation.
- Offers SDI, CAS, fine calculation, e-mail reminders etc.

6. **GRANTHALAYA:** This CUI based (DOS & UNIX) modular LMS is developed on FoxPro by INSDOC (now NISCAIR) for medium range libraries. It includes all the modules required for day-to-day library operations. The package is made of seven modules – library administration; query; circulation; acquisition; serials control; technical processing and data administration. The salient features of the LMS are:
   - Based on object oriented design.
   - Supports CCF and ISO 2709 for import and export of data.
   - Supports Boolean operators and range searching.
   - Provides online help through screen messages.

- Generates a dictionary for various data elements for easy searching.

7. **LIBSUITE:** This GUI or CUI LMS, developed by SOFT-AID Computer Ltd., Pune, is based on web-centric architecture and designed to work with different media. LIBSUITE is based on three-tire web centric architecture in which server machine uses Windows NT/2000 and Internet Information Server (IIS) – as web server. The database server relies on Oracle 8i and clients use web interface for accessing server through Internet or Intranet. LIBSUITE extensively uses latest technologies like Active Server Pages (ASP) and Component Object Modeling (COM).

The following are the significant features of LIBSUITE:

- It provides all the standard modules and supports customised report generation and standard protocols Z39.50.
- The package bundles follow fully featured modules – acquisition, cataloguing, circulation, queries, serials control, set up and maintenance.
- Cataloguing module, apart from supporting regular activities manages multi-format materials, generates entire status i.e. total number of books, number of books issued and number of books available on stack.
- Circulation module supports all the required operations including ILL and generation of photograph of the member in circulation panel.
- System administration module supports controls over the access, creation of authority entries and setting of parameters for cataloguing, circulation, etc.
- Supports stock verification and global addition and deletion.
- Acquisition module supports all media and production of accession register.
- Web-centric architecture ensures use of any machine as client as it does not require the installation of client-side software.

- Provides easy user interface and ensures seamless navigation through Intranet, and login and password based access as security measure
- Includes various utilities like calculator and calendar.

2.3 Standards and Protocols

Standards and protocols are of permanent importance in the process of implementation of library automation. Standards and protocols are instrumental in facilitating the operability, data transfer and data change. Important standards and protocols as applicable in library automation are as follows:

1. AACR-II

The first edition of AACR appeared in 1967, a cooperative effort of catalogers in the U.S., U.K., and Canada. The second edition, published in 1978 and revised in 1988, was developed by the Joint Steering Committee for Revision of AACR with Michael Gorman and Paul Winkler as editors. The AACR provides descriptive cataloguing of all types of materials likely to be found in general library collections. Individual chapters, books, pamphlets, and printed sheets, cartographic materials, manuscripts, music, sound recordings, motion pictures and video recordings, graphic materials, computer files, three-dimensional artefact's and realia, microforms, and serials. AACR provides rules guide for catalogue (i) constructing descriptions to identify and represent bibliographic works in catalogs; and (ii) constructing uniform headings (for persons, corporate bodies, geographic places, and titles) to be used as access points in catalogue. They do not cover subject cataloguing.

2. Machine Readable Catalogue (MARC)

The Library of Congress developed MARC in the 1960‟s. "Machine readable" means that the computer can read and interpret information found in the cataloguing record. MARC is a standard for recording bibliographic data at the logical level. It contains elements for content, physical and process description. MARC is not a single standard, but rather a framework within which each country

has developed an individual standard. The MARC21 is becoming a “de facto” standard as it is being adopted as a common bibliographic format by various National libraries. MARC 21 is the technical standard for the encoding of bibliographic information.

The MARC 21 Formats

The MARC 21 formats are standards for the representation and communication of bibliographic and related information in machine-readable form. A MARC record involves three elements: the record structure, the content designation, and the data content of the record. A MARC 21 format is a set of codes and content designators defined for encoding machine readable records. Formats are defined for five types of data: bibliographic, holdings, authority, classification, and community information. The MARC 21 formats are maintained by the Library of Congress in consultation with various user communities. The MARC 21 formats particularly the bibliographic and authority formats were initially developed to enable the Library of Congress to communicate its catalogue records to other institutions. The formats have had a close relationship to the needs and practices of North American libraries with universal collections. They reflect both the various cataloguing codes applied in the library community and the requirements of the archives community. The MARC 21 formats were designed to facilitate the exchange of bibliographic and related information. An attempt has been made to preserve compatibility with other national and international formats, e.g., UKMARC and UNIMARC.

3. FRBR (Functional Requirements for Bibliographic Records)

FRBR was developed by an IFLA Study Group (1992-1997). IFLA continues to monitor the application of FRBR and promotes its use. FRBR includes a conceptual model of entities and relationships and attributes; identifies specific user tasks that bibliographic records are intended to fulfil: find, identify, select,

obtain; and recommends a set of elements for inclusion in national bibliographic records. As Patrick LeBoeuf put it, FRBR is "a framework for commonly shared understanding". It describes what librarians generally agree on in general terms. It's not a revolutionary system of new ideas and can't be thought of in abstraction from the past library experience and the current library practices.

4. Dublin Core

The Dublin Core refers to a set of metadata element that may be assigned to web pages so as to facilitate discovery of electronic resources. Originally conceived for author-generated description of web resources at the OCLC/NCSA Metadata Workshop held at Dublin, Ohio in 1995, it has attracted the attention of formal resource description communities such as museums, libraries, government agencies, and commercial organizations. The Dublin Core Workshop Series has gathered experts from the library world, the networking and digital library research communities, and a variety of content specialists in a series of invitational workshops. The building of an interdisciplinary, international consensus around a core element set is the central feature of the Dublin Core. A set of 17 core elements in Dublin Core include: Title, Creator, Subject and Keywords, Description, Publisher, Contributor, Date, Resource Type, Format, Resource Identifier, Source, Language, Relation, Coverage, Rights Management, Audience, Rights Holder. Dublin Core is being expanded with “qualifiers” for each core elements. For example, core element “creator” can further be qualified as “creator. Author” or “creator. Compiler” or “creator editor” to specify that creator is an author, or a compiler or an editor.

5. ILL Standards

The ISO Interlibrary Loan Protocol (ISO ILL) was developed to provide uniform procedures when accessing a library across a network to order copy or loan material, and for carrying out the administrative tasks involved in loan management. However, it only provides ordering and loan management

functionality, it does not provide any services to search for or locate an item nor to have the item delivered electronically although it provides some facilities for billing and accounting, these are fairly simple. The standard defines a number of services available to the requesting site and the supplying site. The standard models the activities involved in a variety of scenarios, which include:

- Simple request (with a reply indicating failure to supply),
- Request for the loan of an item with full tracking of the loan including recall notices, renewal request, reporting of lost or damaged items,
- An unsatisfied request being passed to a backup library for supply.

6. Z39.50

Z39.50 is an ANSI / NISO standard for information storage and retrieval. It is a protocol which specifies data structures and interchange rules that allow a client machine to search databases on a server machine and retrieve records that are identified as a result of such a search. Z39.50 protocol is used for searching and retrieving bibliographic records across more than one library system. This protocol is not used by the Internet search engines (they use http). It is more complex and more comprehensive and powerful than searching through http.

Automatic identification

Automation identification of documents in a library and patrons is an important component of effective automation of circulation as well as several other processes. Barcode technology and RFID are two automatic identification technology. These two technologies and their application are briefly described below.

Bar Code Technology

Bar code technology is being used in library and businesses for past 35 years to minimize data entry errors, speed processes, and reduce costs. Most books,

journals as well as other consumer products in the market carry black and white thin and thick strips. These black and white strips are known as barcodes. Barcode technology offers a mechanism that can be used for identification, location and tracking of items that are bar coded. Book Bank modules are typically required by academic libraries that facilitate long-term issue of multiple nos. of text books to students entitled for the facility. Barcode is not a new technology, it was introduced in 1940 although it was first applied commercially in 1960‟s as a method for tracking rail road cars. Since then, it has been used extensively in consumer industry, material handling industries and libraries.

Radio Frequency Identification (RFID)

RFID (Radio Frequency Identification) is a term used for a radio-enabled device that communicates with or interrogates a tag or smart label, which is embedded with a single microchip processor and an antenna. The origin of the term lies in the invention of "tags" that reflects back or re-transmit a radio frequency signal. The two components of RFID are tags and readers. The tags or label is equipped with a single microchip processor, an antenna and an ID code that can be embedded in almost any object. RFID readers are radio-enabled devices that communicate with or interrogate RFID tags or labels wirelessly and obtain the ID code on the tags from a distance of several inches. The RFID readers can be fixed or made portable just like barcode scanners. RFID can also be referred to as a high-tech version of the barcode. In the past few years, the cost of RFID tags have come down drastically. Low cost RFID tags, typically costs less than Rs. 40.00 each for up to 1 metre range making the technology affordable as an alternative to the barcode, magnetic strip or printed label. RFID has advantages that include tolerance of mis-orientation and obscuration, lower cost over life and ability to "read". Most importantly, RFID tags are cheap enough to be disposable and thin enough to go even inside the sheets of paper in some cases.

Conclusion

Library automation is the process which needs proper planning, timely operation and periodical evaluation. The librarian with the administrators has to set the priorities after analyzing the current status and future requirements. Selection of the suitable integrated library management software according to the need of the uses ad the library is important.OPAC, circulation and serial control, etc. should be conducted with care. Staff training and user education are key to the success of the process. Librarians should acquire adequate knowledge about the hardware and software option available. All libraries should use standard software packages for automation and database creation to facilitate the exchange of bibliographic records between libraries.

Information and Communication Technology (ICT) is changing the work of libraries and information centers. Library automation activities are gaining momentum throughout the state. It is quite a good sign that SOUL is now available at an affordable cost as a comprehensive library automation package. However, librarians should be prepared to meet the challenges. They should acquire adequate knowledge about the hardware and software options available. All libraries should use standard software packages for automation and database creation to facilitate the exchange of bibliographic records between libraries. Databases may preferably be created in the MARC21 format because most libraries at the international level follow this. There is need for continuous monitoring of automation activities for improvement of the situation and for meeting the future needs. Therefore, it is concluded that the Status of computerization of library housekeeping operations and computer based library services of college libraries is in nascent stage. A number of integrated library software packages are now available in the market, such as Libsys, SOUL, Virtua, SLIM++ etc.for automating all library operations. The library automation

package should be selected in such a way that it should satisfy the present and prospective requirements of a library.

There are a wide range of options available to libraries for retrospective conversion of bibliographic records of documents available in their libraries. These methods include direct keying-in of records, buying records from external source like OCLC, downloading records from Library of Congress Online Catalogue / INFLIBNET`s Union Catalogue of Books and scanning of title page.

Most integrated library systems covers five modules i.e. acquisition, cataloguing, Library OPAC, circulation and serials control, that are used to automate various in-house operations of a library. Besides, several integrated library systems also offer additional modules for article indexing, stock verification, report generation, handling media, etc. Bar code technology and RFID are two automatic identification technology used for library automation.

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