

LIBRARY AUTOMATION

3.1 Introduction :

Information is essential for each and every human activity in the world. It plays a key role in the overall development of any nation, because it encompasses all findings derived from human knowledge and scientific research and forms the basis for future research and development' The term information has been defined by Prof. R. G. Prasher "Processed data or systematized body of facts which is useful to us, which effects the decision and reduces uncertainty is known as information. The explosion of information has rendered complexities control and dissemination though the last three decades have seen a variety of successful efforts in this direction. The task of information generation has been facilitated by computers, especially on line access to databases, e-mail services through networking".

The juxtaposition of 'computer' and 'libraries' may at first sight, appear incongruous and anchoring. They may even be termed strange bed fellows. This apparent misconception or incompatibility has in it historical background in the way the professionals in the respective fields handle information resources. libraries have traditionally been considered as store houses of various kinds of macro-documents. Apparently useful but pre coordinated and prearranged sequence. In a society where information is essential, the library function of information supply will be crucial

One of the leading computer magazines in India wrote in its special report for a January 1990 as follows: 'The decade that has just passed by can aptly be called the decade of computer. Because, of all the technological achievements and innovations that were made during the last 10 years, it was only during the last decade that they came of age demonstrated their powerful ability to lend a healing touch to every aspect of our life. And the coming decade will see computers rising to new height of power and glory that none can dare imagine at this stage'

There is no exaggeration in the above statements as we all know that it was during the last few year that phenomenal change have come over the computer technology and computer industry. If a decade ago, computer was something that was within the reach of only a privileged few technologists because of its exorbitant cost, today computer are being brought into the hands of the masses, by drastically

lowering the prices. And today the hard reality has gradually drawn on all of us that we must either live with computers or get lost.

Thus computers are used by libraries to increase the efficiency and effectiveness of their operation and services. They also provide management information for taking effective decisions. Development and use of Information Technology (iT) enable the libraries not only to offer their clientele the appropriate information available within their libraries but also gain access been assess to catalogues of other libraries. both local and outstations”.

(Vasant and Mudhol 2000 , p.2)

By making right decision regarding the development or purchase of software packages to be used the library and information worker can harness the power of the country with maximum effectiveness. The human and financial costs of new computer applications such as those for library operations are dominated by the cost of developing the necessary software. Experience shows that a large proportion of software costs is attributable to the maintenance that is error detection, correction, and other modifications of software already produced. A disciplined approach is therefore recommended in alt steps such as task definition, programs design coding testing and fault finding associated with software development activity. High quality documentation is essential at all stages. All this time consuming labour intensive and costly activity which discourages development of new computer application in different areas of library and information services. It is for this reason that a library and information worker requires exposure to readily available library software packages .

(Baijpai,S.K.1999, pp.1-9)

3.2 DEFINITION

Library automation is the use of automatic and semiautomatic data processing machines to perform such traditional library activities as acquisitions, cataloguing and circulation. Library automation may thus be distinguished from related fields such as information retrieval, automatic indexing, and abstracting and automatic textual analysis. The term automation applies more correctly and narrowly to automatic process control. However the term ‘automation’ is defined by encyclopedia of

computer science and technology as in business world the words 'automation' and computer' are often used synonymously”.

(Sing,Gurudev 2007, p.107)

The automation is defined as 'the technique of making apparatus (as a manufacturing), or a system (as of book keeping) operate automatically”¹⁰. According to the encyclopedic dictionary of library science the automation is “the technology concerned with the design and development of the process and systems that minimize the necessity of human intervention in their operation.

In the opinion of Bhattacharya “there are certain activities traditionally associated with libraries- such as acquisition, serial control, cataloguing and circulation. Today the term ' library automation' is used extensively to refer primarily to the use of computer to perform some of the traditional library activities such as those mentioned above. Conventionally some related fields-such as, information retrieval, automatic indexing and abstracting, automatic textual analysis etc. do not generally fall within the preview of library automation. But this distinction is generally disappearing; for example, 'information retrieval is now included within its purview. So also is the case with networking. Though computer play the primary roles in library automation today, yet the roles played by telecommunication technology and the reprography technology are of great significance because of the extent support they offer to library automation”

(Faruqi, K.K.1997, pp.115-123)

3.3 LIBRARY AUTOMATION

Library automation is a process that brought and will continue to bring profound changes to the library world in terms of both technology and the

Involvement of people. The phrase library automation has been used on occasion almost synonymously with library mechanization. This is not quite accurate. At the another end of the spectrum, it would be convenient to equate library automatic. with the computerization. In the context of computerization machines with appropriate capabilities and software that has been properly written are pre-requisites to any successful venture in to library automation. But beyond these pre-requisites library automation is an much a human process as a technological one.

(Shafique,Farzana 2011,pp.18-20)

Computer technology has gone through several stages in a relatively short period of time (30-35years). In the 1950s computers were large and, by today's standards slow vacuum tube units that generated heat and required air conditioning and a great deal of money to buy. In essence, automation is used to reduce the amount of staff time devoted to repetitive (and often less challenging) activities that must be done in any properly functioning library. One fact must be kept in mind that various library processes are automated, not the library as such; a fact many lay people fail to recognize. Automation has many definitions, but for our purposes 'one from Martin Weik's standard dictionary of computers and information processing is satisfactory.

(Malavya, V.C. 1999,pp.1-7)

Automation - the entire field of investigation devoted to the design, development and application of methods and techniques for rendering a processor group of machines self actuating, self moving, or self- controlling. Automation pertains to the theory, art or technique of making a machine, a process, or a device more fully automatic. Simply, the implementation of process by automatic means. Computers and information process equipment play a large role automation of a process of a process because of inherent ability of a computer to develop decisions that will, in effect, control or govern the process from the information received by the computer concerning the status of the process. (Sing,Gurudev 2007, pp.107-108)

For libraries, the most common automation device is the electronic digital computer. Library processes that are now being “ controlled” by the computer include book keeping, materials ordering, cataloguing serials control, circulation, circulation, bibliographic data retrieval and some aspects of inter library loan work”

(Faruqi, K.K.1997, pp.118)

3.4 NEED FOR AUTOMATION :

In view of Galhotra, Mahan Kumar (2008,p134) This is the age of computer, Computers has revolutionized all fields of knowledge, It has been gradually weaving electronic webs in various parts of the globe for quite a few years now. Nair, R.R. (1992,pp.229) Now it is being used extensively in libraries by developed countries and in a limited scale in the third world countries and in a limited scale in the third world countries. Today, information technology coupled with computer technology has conquered even space and time with regard to dissemination of information.

(Sing,Gurudev 2007, pp.108-111)

The need for automation is emphasized because of the following factors :

- i) Traditional methods for handling the information are inadequate. One is bulk and growth rate of information.
- ii) Difficult to update the information due to voluminous increase and rise in the degree of specialization involved.
- iii) Techniques are suggested for applying the computers with its advantages of speed. Vast storage capacity and accuracy to library work.
- iv) The need for co-operation and resource sharing and hope of achieving some saving through automation made to switch over to automation.
- v) Operational advantages :
 - a) Offer flexibility
 - b) Speeds up processing
 - c) Greater, accuracy, efficiency, consistency and improved work control.
 - d) Reduces repetitive clerical work.
 - e) Permits ease of bibliographic control, checking and updating.
 - f) Permits improved budget control. (Pande 1995,p.114)

3.5 BASIC OF LIBRARY AUTOMATION :

Library automation is the use of automatic and semi-automatic data processing machines to perform such traditional library activities as acquisition, cataloguing and circulation. Although these activities are not necessarily performed in traditional ways, the activities themselves are those traditionally associated with libraries; library automation may be distinguished from related fields such as information retrieval, automatic indexing and abstracting and automatic textual analysis. (Vasant and Mudhol 2000, p.7)

In the recent years the advent of micro computers and many application software packages have made the information professionals to switch over to automate their library routines. Thus, a large number of libraries in the world have automated one or more of the functions such as (a) Acquisition, (b) Serial control, (c) Circulation and (d) Cataloguing, Depending on the type of library, all or some of these functions may be computerized according to their priority. Circulation control may be given first priority public library while serial control may be given a top priority in a special library similarly acquisition may be computerized first in

university libraries. However, cataloguing is important for any library and its computerization must be one of the ultimate aim of the automation.

(Faruqi, K.K.1997, pp.115-120)

There are number of ways to go about automating these house keeping operations. Such as developing one's own software which is available in the market or using well proven application software packages or some pacakages or some packages like, LIBSYS, CDS/ISIS, MINISIS, etc.”.

3.6 PLANNING FOR LIBRARY AUTOMATION :

An automated library activity results when a computer is used to support a library such as acquisition, processing circulation of materials or provide access to information. In automated library activity staff and computer share responsibilities for performing work alternatively like a staff member perform the first five processing operations, the computer, the next 8 operations ald the staff member, the next two operations and so on. Due to sharing of responsibilities the automated activities can be called human machine functions”. The computer is merely a tool enabling librarians to do things rapidly, accurately and less expensive than the manual, methods. Complete automation without human intervention and control do not exits and are not like to exist in future. (Vasant and Mudhol 2000 , p.11)

3.7 SOFTWARE AVAILABILITY

Baijpai,S.K.(1999,pp.106-108) is stated that Software availability for the libraries may be classified into 3 categories: in-house; Commercial and co-operative. In-House: Parent organization in which the library is apart may have the computer department and software specialists. In such cases, the library can use their services to develop the required software. Presently, many Indian libraries are using such initially developed software. Spreadsheets (ex: Super Scale, Lotus 123) and graphic packages. These can be used as tools for developing a broad range of application. The general purpose software package like word processors and DBMS can be used profitably in library and. information work whenever a situations demanding their needs arises.

(Pande,S 1995, p.140)

3.8 SOFTWARE SELECTION

Hard ware and software are two important components that are responsible for the success of automation. Software selection is one of the success . of automation. It is one of the major tasks of planning. Selection of software is a complicated issue and it partly depends on the number of functions to be automated. The software selection team consisting of library professional and computer specialists have to visit automated libraries to examine the facilities available and problems encountered by the library staff. Observation and discussion with the actual users of software provides enough background information and help the team in selecting the appropriate software. (Baijpai 1999, pp.260-65)

3.9 EVALUATION AND SELECTION OF SOFTWARE PACKAGES.

To select a software package which may be perfect or near perfect for the specific task of a library is not an easy job. A package which does not perform as expected or which requires expensive modifications will shake its creditability to the librarians responsible for the purchase of software. A change of finding a right package could be improved by setting up an evaluation process based on common sense, sound judgment and dash of skepticism. The evaluation process should start with a detailed look at the problem software has to tackle and proceed through a technical evaluation of the packages, testing and negotiation over maintenance and service. (Nair, R.R. 1992,p.92)

For identifying, evaluating and selecting packaged software for library the following criteria suggested by Garoogian may be adopted.

- 1) First make yourself clear of your short term and long term needs of which you intend to buy a software. Develop functional specification of each job that you want to do with the software.
- 2) Make a survey of the suitable package in use for envisaged tasks by consulting relevant directories and writing to the library and create a short list of appropriate basis of its specification and capabilities and seek clarification from the vendor. The experience of the library may be relied upon more than the assurance of sales people. Review of software packages published in library journals may also be examined.
- 3) The reputation of the firm may also be considered while buying a software. It is probably worth paying a bit more software for a software package from a

repeatable firm which is less likely to have “Bugs” and more likely to be unknown identifier.

- 4) A software must be compatibility to the computers on which it has to run. Some package use a special peripheral devices like modem, hard disk etc. A few others are designed to be used with DBMS or spreadsheets while buying a software the concerned library should verily whether any companion programme (s) or a special devices/hardware are required or not.
- 5) The software must be flexible enough to work with both fixed and variable length records. It must also meet a limits set for file size, record size, field size etc.
- 6) It should be user friendly so that it could be used by people with little or no knowledge of computer.
- 7) The software package must have good documentation to include system and run level narrative description, system logic and logic flow charts, input and output and file description and layouts, operating instructions and input preparations instructions.(Vasant & Mudhol 2000, pp.51-53)
- 8) The Vendor must support installation and provide training to operating ‘personnel an user’.
- 9) As the software packages get updated, vendor must notify new features and improvements.

Important than all these criteria is cost if package which must be within budgeted amount and it, should include vendors change for training, installation, maintenance and updating. Buying a package software arises many risks. But by careful study of needs and evaluating the software. (Shafique,Farzana 2011, pp.39-46)

3.10 APPLICATIONS OF LIBRARY MANAGEMENT SOFTWARE PACKAGES

A) Acquisition System

- 1) This system covers the acquisition process of library material including books, government documents, CD-ROM, electronic resources. Generally it referred to ordering the books, receiving and payment. (Malavya 1999, pp.241-257)
- 2) Functions of Automated Acquisition System

The Acquisition system functions as the central order and payment area for library materials including books, serials and periodicals, non-print items, electronic

journals and databases, CD's and videos. We do this by investigating the fastest method of acquiring the items at the best cost. In other words, we try to get what you need at a good price and as fast as possible. We are committed to the needs and concerns of me-staff, faculty, researchers and all library users..

The library acquisitions department strives to acquire materials in all formats for the library collection quickly. Efficiently and economically along with effectively spending the materials budget in a timely manner.

3 Selection of library materials

Academic staff and the committee carry out selection predominantly library suggestions are accepted from faculty students, and general staff. The acquisitions team with the end of the previous semester obtains recommended texts.

The librarian, library committee, and the faculty members are authorized to select the library materials. The library acquires that material through book fairs lists provided by library vendors, lists provided in publishers, Catalogues and the physical presence of books on direct request of a Librarian, library committee, faculty member, or researcher.

4 Book order procedure

- The Acquisitions department receives orders either from the Librarian, faculty member or the Library committee.
- Requests can be submitted on the "Book Requisition Form" which is available at both campuses libraries' in paper form.
- The book requisition form can be submitted between 10:00 A.M.-12:00 P.M. (daily) to the acquisition department at the main campus library. No order will be entertained after this time.
- Incomplete requests will not be entertained.
- Orders submitted by faculty members must have an authorized signature of the faculty member and the Head of Department as well.
- If a request has more than 2 copies of the same book then multiple copies will only be purchased when a title is recommended as a textbook (prescribed text) or a reference (recommended text) for a course offered.
- Items normally must be ordered significantly (2-3 months) before they are needed.
- The turnaround time will be 3-4 weeks, if item(s) is locally available.

- The turnaround time will be 8-10 weeks, if item(s) is not locally available.
- The requestor should also be notified, as soon as possible, if an item is not available for any reason, either out-of print, not yet published, out of stock indefinitely, or if there is a great price discrepancy.
- We will place an order to the local vendor, supplier or directly to the publisher.

5 Rush orders

We process an order as a Rush Order if it is needed for immediate use. Keep in mind that Rush orders are ordered direct from a publisher, and so we do not benefit from the discounted prices that vendors offer. In addition, a Rush order is subject to extra handling and shipping costs per book. This is charged against the department ordering the item.

The turnaround time is 6-8 weeks for rush orders; if items of rush orders are locally available the turnaround time will be 2 weeks.

Creating Purchase Orders from Selection Lists: Staff with permission to create purchase orders may select items from the Title Selection list window and create a purchase order.

6 Non-print items

Audio Cassettes, Videos, and CD's, can be ordered by faculty and staff members. These orders are processed on the same requisition form.

7 Journals order procedure

Journals are ordered by the Acquisitions Department. The Acquisitions Department produces departmental lists of journal titles that are purchased in support of each subject, since journals are purchased on a subscription basis for an academic calendar year.

Requests for new journals are considered throughout the year however; it is recommended that new requests be submitted no later than September prior to the calendar year in which the subscription is to start. This allows the vendor to place the order with the publisher in time for January. A new journal request is forwarded to the Chairperson, Library Committee and Director, where a variety of issues including shelving space, funds, and collection development are considered.

8 Integrated Library system for Acquisitions

The Acquisitions module must all be fully integrated with system modules and must support an unlimited number of material types/formats, funds, vendors, orders, claims and transactions, without added cost. The system must dynamically updated in real time to maintain the currency of all records and statistics.

(Nair, R.R. 1992,pp.142-143)

The Acquisitions module must support the following functions.

9 Fund management

The Acquisitions module must permit:

- a. Temporary freezing of funds with override capability.
- b. Freezing new order but permitting payment on outstanding orders.
- c. Freezing both new orders and further payment.

The Acquisitions module must:

- a) Enable each fund to be subdivided (categorized) by up to five levels.
- b) Enable each subdivision to be used to group accounts together as an online workstation query.
- c) Enable each subdivision to be used to group accounts together to report on spending in the different categories
- d) Allow remaining allocations to be carried over from one fiscal year to the next, if desired

The Acquisitions module must enable an authorized operator to:

- a) Create new accounts at any time.
- b) Enter an initial allocation when an account is first created.
- c) Update an account at any time.
- d) Close out an account at any time, so long as there are no outstanding encumbrances against it.

For each fund, the Acquisitions module must maintain the following information, which must be available through online display, without the need to generate a report:

- a. The original budget allocation.
- b. Dollar amount of orders outstanding (encumbered).
- c. Dollar amount of orders paid, the free balance.
- d. Cash balance, the number of items on order.
- e. Number received.

- f. Number paid for.
- g. Number of orders placed for the fund.

The Acquisitions module must allow multiple distribution methods, including:

- a. Library-defined holdings code.
- b. Directly to requestor's address.
- c. Indirectly to requestor with shipment to library for processing.

The Acquisitions module must support an unlimited number of vendor records, accessible by vendor name (complete), vendor name (truncated), and vendor number. The vendor record must include at least order and remittance addresses, library-supplied vendor claim period indicator, and performance statistics.

The vendor file must include performance statistics updated automatically and in real time, available online and through reports, that include, but are not limited to:

- d. Average receipt period in days.
- e. Number of claims sent.
- f. Number of copies cancelled.
- g. Number of copies claimed.
- h. Total amount ordered.
- i. Amount encumbered.
- j. Amount invoiced
- k. Amount paid.
- l. Total number of orders.
- m. Number of copies not received.
- n. Number of copies paid.
- o. Average order price.
- p. Average price paid.
- q. Average discount.
- r. Supply times

Vendor records must support up to three distinct addresses per vendor, such as ordering, service, and marketing, and also provide notes / comment fields for Library staff.

10) Add purchase order

The Acquisitions module must support an unlimited number of order records. Order records must be searchable by bibliographic information, including item ID. Orders must be searched, browsed, or exactly matched by order ID, author, call

number, general, medical subject, periodical title, series, subject, title and title control number. Packing list and requisition numbers must also be searchable. Order line searching must also supported. Acquisitions staff must be able to specific the fiscal cycle and acquisitions to search. The Acquisitions module must prevent duplicate order ID numbers. An alert must be provided staff before the order is saved to the database.

The Acquisitions module must :

- a) Prevent assignment of duplicate order numbers, whether entered manually or assigned automatically.
- b) Support electronic submission of orders.
- c) Support electronic data interchange (EDI).
- d) Accommodating multi-institutional and multi-fund shared acquisitions.
- e) Link order records to the corresponding bibliographic record.
- f) Report the current status of any and all titles ordered or received.
- g) Use status information to signal for a variety of activities, open order report, etc.
- h) Enable an authorized, operator to access orders through the catalog, vendor' account, and requester

11 Creating purchase order from selection records

The Acquisitions module must support selection lists with access controlled by user l0grn and password.

The Acquisitions module must :

- a) Provide a selection list feature whereby titles the Library intends to order may be kept online.
- b) Accommodate desiderata files that may also generate consider for reactivation reports based on dates incorporated from the desiderata records.
- c) Allow staff to vote on purchase decisions.
- d) Must automatically link purchase requests to items contained in a selection file, which can be hidden from public view and made accessible only to authorized users.

12 Receipt of materials

The Acquisitions module must automatically determine how to handle a partial receipt of ordered items, based upon Library policies- Describe. A receipt records the arrival of ordered material and is attached to a purchase order. It follows that before you can receive line items, a purchase order must exit. Further, you cannot enter receipt information for a purchase order unless that order has been status ordered. Which means that the order has been transmitted. All receipt activity takes place on the receipts window.

The receipts function lets you add, update, view, and delete receipts that are directly related to ONE purchase order. In the case of a Serial order, the function lets you add, update, view, and delete the first expected issue.

For every purchase order line item, You can choose a receipt status from a full-down list box in the Edit Receipt Information. Software provides a number of preset receipt statuses, but your library will want to define its own. Not received, received satisfactorily, Receive not satisfactorily, Referred to a supervisor, hold pending investigation, Returned.

Assigning a condition to indicate a special type, status, or condition of receipt. Your library can define condition values in the acquisitions parameters. Some samples of conditions: correct, damaged item, defective item, duplicate, wrong title, wrong edition.

Adding to the new book list: If you select on New Book List check box on the Edit receipt information dialog box, the item in the database so that it will be included in a New Book List report. Print the receipt slip. Your library can customize the receipt slip by editing or translating the default file.

13 Invoice management

The Acquisitions module must support an unlimited number of invoice records. Staff must have the option to search and retrieve invoices by: invoice ID and optionally, a line number, a vendor ID, or a check number. Staff must be able to specific whether to display summary information, extended information, amounts, dates, and/or numbers associated with invoices.

The invoicing function lets you record invoices as they are received from a vendor and link them to the associated purchase orders. It consists adding, updating, viewing, and deleting invoices and invoice line items.

14 Currency rule

The currency chosen at the time of invoice may be different from the currency used for the purchase order. The currency chosen for the invoice must be the same as for the voucher payment. Fluctuations in currency exchange rate values are not dynamically updated. Libraries are responsible for updating currency exchange rates in accordance to their established policies.

Add Invoice number in the purchase order, software verifies that this is valid invoice for the vendor you selected during ordering and generate a invoice is created for payment.

15 Voucher

The voucher function is used to pay invoices. A voucher may be used to pay multiple invoices provided they are from the same vendor. In addition, vouchers may be paid in whole or in part.

16 Payment

Add invoice window displays the home currency by default, but if you want, you can choose another currency for the invoice. 'About the invoice taxes, the software will automatically calculate the tax on an invoice or invoice line item based on the percent specified in the parameter and will automatically charge the tax, whether it is applied to the invoice or an invoice line item, to the specified accounts.

Payment vouchers with invoice: Create a new payment voucher or view an existing one that contains a list of invoice eligible for payment and belonging to a specified vendor.

Credit: Generally two types of credits, specific and internal, which you can assign when you create a credit record.

Specific credit: This credit is linked directly to a vendor and used against any future invoice presented for payment.

Internal credit: This credit is created internally and used to adjust the expenditure for an account, for example, when an order for partially paid item is cancelled.

17 Reminder claiming /cancellation of orders

The Acquisitions module must be able to automatically generate a claim cancellation letter to the appropriate vendor regarding copies/volumes canceled and the reason. The Acquisitions module must be able to transmit claims and cancellations via letter, email, or X12.

If an order passes its library defined date to claim', the system must automatically add a claim segment to the appropriate outstanding line items on the order. Each claim segment must include a claim reason, number of copies claimed, times claimed, part or volume claimed (for multi-part items), date mailed, vendor response, date of vendor response, and claim status (OPEN, RECEIVED, CANCELLED.) The system must update elements in the claim segment automatically.

18 Gift items

When gifts or legal deposits are received, Virtual provides a way to both record and acknowledge receipt via the 541 tag of the MARC bibliographic record. The information from the sub fields in the 541tag are used to generate acknowledgment letters.

Complete the record, using all required fields as well as the 541 tag (Immediate Source of Acquisition), which contain additional information needed for the acknowledgment letter.

\$a - Source of acquisition (NR) The name of the person or organization that is the of the material

\$b - Address (NR)

\$c - Method of acquisition (NR) The terms under which a transfer of physical custody occurs for example, by gift, loan, or purchase

\$d - Date of acquisition (NR)

\$e - Accession number (NR) The identification code assigned to materials acquired in a single and separate transfer of custody.

\$f - owner (NR) The individual or organization with legal custody over the described materials

\$h - Purchase price (NR)

\$n - Extent (R) The number of items acquired

\$o-Type of unit (R) The name of the unit of measurement for example, cartons.

(Aswal,R.S.2006,pp.125-128)

B) Cataloguing System

1 Cataloging Records in the MARC :

This system covers the concepts of cataloging and. authority control. The Bibliographic Control Cataloging module must allow the Library to create and maintain full catalog records searchable only by library staff.

The Bibliographic Control Cataloging module must provide Cataloging wizards that streamline the process of:

- Adding a brief title record
- Editing existing titles
- Duplicating an existing title
- Removing title, call number/volume or copies
- Creating and editing call number/volume records
- Adding or editing copies (includes global edits)
- Offering authority control options (display, add, duplicate, edit, remove)
- Bound-with processing is straightforward
- Providing access to a cataloging review file
- Transferring title, call number or copies
- Linking order line holdings to titles
- Capturing and editing records from Z,39.50 sources using a Z39.50 copy cataloging client. (Sing 2007, pp.177-188)

When duplicating a title, authorized staff must be able to pre-set values within the Cataloging wizard, including but not limited to:

The automatic addition of a 006 field

Hiding the record display from the Web OPAC (from public user searches)

- Item type (to prevent repetitive data entry)
- Item price
- Statistical categories
- Record format (e.g., MARC, Dublin Core, Map, etc.)
- Auto-generate temporary call numbers
- Whether to add a copy automatically when adding a call number/volume record
- Whether to auto-generate an item ID when adding a copy / item
- Ability to validate authority headings (if authority control is used by Library)
- Printing spine labels

When removing a title, call number, and/or item record, the Bibliographic Control / Cataloging module must alert staff if a bill or hold is associated with the material. Staff must be able to immediately investigate the open transaction, without closing the removal process. (Pande 1995, p.124)

When using the Bound-with process to link bibliographic descriptions for items bound together, the Bibliographic Control /Cataloging module must use parent and child call number records. A child call number with copies must not be bound with a parent call number. A child call number must be linked to only one parent, but staff must be able to link a parent call number to an unlimited number of child call numbers.

In the transferring title, call number/volume, and / or copies process, authorized staff must be able to :

- Transfer all copies to an existing call number
- Transfer only selected copies
- Transfer all volumes
- Transfer only selected volumes
- Remove a title automatically after staff elect to transfer the last copy or volume to a new title
- Search and display bibliographic information without exiting the transfer process

Items on reserve or in transit must not be transferred. Inactive; available title-level holds linked to a call number must also block the transfer. The Bibliographic Control / Cataloging module must alert staff to such exception conditions when staff attempt to transfer records.

At Library staffs discretion, records may be hidden from public user display at the title level (to hide bibliographic data and all associated items), the call number level (to hide selected volumes and all associated copies), item level (to hide selected copies), or by assigning the item to a “shadowed” location.

The Bibliographic Control / Cataloging module must support MARC format error checking, including:

- Error checking (tags, indicators, and sub fields) for all formats
- An error message displays when incorrect values are entered
- Prompts for correct data
- Automatically verifies and validates structure of each type of record maintained by the proposed system
- Performing the following error checks:
- Entry of valid tags

- Proper format as defined for each field (e.g., field length, character type, and numeric range checks).
- Valid entries in controlled fields (from authority lists or files)
- Presence of mandatory data elements
- Supplies default data element identifiers (tags, indicators, sub field codes, etc.).

Whenever applicable, the Library may specify tags for each template as well as default codes. The Bibliographic Control / Cataloging module must not require a specific interface to any MARC -based cataloging source. Describe MARC record loading capabilities/utilities within the proposed system.

The Bibliographic Control/ Cataloging module must include a utility for verifying uniform resource locator (s), or URLs, cataloged within MARC 856 bibliographic fields. Describe

The Bibliographic Control / Cataloging module must support creation, editing and maintenance of Community Information records in the MARC Format for Community Information and in a locally developed format

2 Z39.50 MARC Cataloging Client :

Bibliographic Control / Cataloging module must include a Z39.50 Copy Cataloging Client that can capture bibliographic records from any Z39.50 bibliographic resource

The Z 39.50 copy cataloging client must capture MARC records from OCLC directly into the Library's catalog, while at the same time updating the Library's holdings on OCLC to reflect the addition of the record.

OCLC and Library of congress provides the facility of copy cataloging. OCLC provides the golden databases 'World cat', the world's largest bibliographic databases. (Sing,Gurudev 2007,pp.118)

Library of congress is open sources databases

Set the Z39.50 database you wish to obtain records from by selecting databases. Here one example of a Z 39.50 databases from which you might obtain records is the Library of Congress. Z39.50 is a International Standard, ISO 23950 and specifies a client / server-based protocol for searching and retrieving information from remote databases.

Library of Congress connection information

Profile Name : Library of Congress
Description : Library of Congress
Host Name : Z3950.loc.gov
Port : 7090
Database : VOYAGER

Type in the Profile name, Description (name appears in the Connection List box), Host name or IP address of the database, and enter the port number of the database.

After searching the record it can be save to the desktop or directly in databases after proper editing.

3 Authority Control

An authority record is a tool librarians use [o create forms of names for the persons, places, titles, subjects, etc. that are found in bibliographic records. Authority records provide a controlled vocabulary and cross reference system for accessing bibliographic records

The Authority Control module must link all authority controlled bibliographic headings with corresponding authority records through an ANSI- standard thesaurus.

The system's Authority Control module must include a machine-proposed authority feature based upon the Standard for Machine Proposed Authority Records (<http://www.loc.gov/catdir/pcc/strawn.html>) developed for the Program for Cooperative Cataloging, which must generate a new authority record with reasonable values in the fixed field and 001, 005, 040, IXX, and 670 entries (plus the 022 and 642-G40 entries for a series heading). These values must be automatically generated based on the information in the bibliographic record being validated. Describe.

The Authority Control module must enable the system administrator to specific whether entry of bibliographic data which does not match an authority record must result in rejection of the input, or in a warning, in which case the system must:

- Display a browse list of possible authority headings from which the operator may choose by clicking the desired heading to replace the unauthorized heading in the bibliographic record
- Automatically flag the unauthorized entry for later display, review, and/or printing

The Authority Control module must support multiple authority files, including separate authority indexes for LC name and subject headings, NI,NI subjects, or other locally defined indexes.

The Authority Control module must enable the Library to define an unlimited number of authority formats or types, and to specify the bibliographic fields and subfields addressed by each authority record type through policy configuration

Vendor must describe the Authority Control module's interactive authority control heading verification process. Describe what the system does when an unauthorized heading is detected?

The Authority Control module must automatically generate appropriate See and See Also references from Authority records for use in the online catalog.

4 Gift and Legal Deposits

When gifts or legal deposits are received, Software provides a way to both record and acknowledge receipt via the 541tag of the MABC bibliographic record. The information from the sub fields in the 541 tag are used to generate acknowledgment letters.

Complete the record, using all required fields as well as the 541tag (Immediate Source of Acquisition), which contain additional information needed for the acknowledgment letter.

5 Produce Spine and Bar Labels

Software can generate spine and bar code label information to a text file that can then be used with a label program or word processing program to generate labels. This text file can be edited if needed to add or remove data elements.

The Lab Input.txt file will create a label indicating the location, call number, copy number and bar code (accession number).

C) Circulation System

1 Circulation Module

The Circulation module must support the following features:

- Full-text search of any word within any bibliographic field
- Circulation functions at a workstation in real time
- Offer an interface with user self check workstations
- Provide a graphical backup circulation client

- Enable operator to circulate uncaptioned items on the fly (e.g., add a brief title, add copies)
- Brief bibliographic records, as well as charging and lending items for interlibrary loans
- Checkout
- Check in
- Renew all items or renew a single item
- Bill a user
- Pay a bill
- Display, create, edit, copy, and remove user record
- Confirm user address
- Renew user privilege
- Send user a message
- Place, edit, display, remove holds
- Claims returned
- Lost card processing
- Modify an items assigned due date
- Mark item used and inventory
- Charge ephemeral (impermanent) items
- Book drop check in
- Place and track items in transit (for multi branch and multi-library systems)
- Circulate items borrowed through ILL once a brief bibliographic record has been created, with local circulation loan parameters determined by a matrix of user profile, item type, and location
- Lend items to ILL partner libraries by creating a user record for each library's ILL department. (Malavya 1999, pp.142-145)

As Per Galhotra, Mahan Kumar (2008,p.139) When an item presented for checkout presents an alert of 'still charged to previous user the Circulation Module must allow staff to enter an override password to immediately discharges the item and must allow staff to immediately checkout the material to the present patron.

The Circulation module must sever the link between the item and user at discharge; however, it must be possible for authorized staff to determine the last user

to have charged the item until the next user discharges the item, to allow investigation of any damage to items.

The Circulation module must interface seamlessly with other modules, including Cataloging, to enable authorized circulation staff to:

- Add a brief title
- Add copies
- Change item barcode
- Mark item missing or lost
- Remove title, call number/volume or copies

The Circulation module must enable individual user record creation, as well as a patron load utility that allows user records to be imported and updated en, masse.

When a user who has lost or misplaced his/her library card, the Circulation Module must automatically deactivate the previous library card number and must transfer the user's charges, fines, overdue, holds and bills to the new ID.

2 Checkout

- Vendor must describe its circulation policy matrix that allows the Library to define the precise terms under which items can be circulated to users. Circulation policies must be flexible, specific to the Library or to each individual library within a multi-library consortium.
- The Circulation module must support checkout transactions of impermanent materials. These checkout transactions must be recorded for statistical reports and checkout data, but must not be used to generate late notices or bills.

3 Check In

- The Circulation module must allow staff to accept payment for fees/bills during item check in (e.g., accept payment for overdue fees) without leaving the discharging process.
- The Circulation module must alert staff and immediately place an item in transit to its home location, if the item is checked in at a location other than its home location.
- The Circulation module must support printing replacement barcodes for damaged item barcodes immediately upon item check in.
- The Circulation module must support the discharge/check in of floating collection materials. When floating items are checked out, then returned, they

become a part of the discharging library's collection. The Circulation module must prevent this floating discharge if the item is needed for a hold, booking, or reserve at another library.

4 Routing / Transit (For Multi-Library Systems)

- The Circulation module must automatically track an item's current and home locations (e.g. Checked out, ILL, Reference, Bookmobile) and must display these locations for staff and public user searches.
- The Circulation module must permit staff to view items presently in transit to the staff work stations library (in a multi library system) at any time.

5 Renewals

- The Circulation module must allow both the renewal of a single item and the renewal of all items charged to a user. Staff and user self-renewal (for selected item(s), and via the web OPAC) must be available.
- The Circulation module must alert staff attempting to renew items for delinquent, blocked, and barred public users. Staff must have the option to investigate or enter an override password to continue with item renewal.
- During renewal, staff must have the option to select a special due date, or to allow the Circulation module to automatically renew according to local library circulation loan policies. (Malavya 1999, pp.249-252)

6 Fines / Bills

- The Circulation module must support an unlimited number of fine structures, such as hourly and daily. Each fine structure amount may accrue in different rates (fifty centers per unit, two dollars a day, etc.)
- Circulation staff must be capable of displaying all bills within a user record, as well as limiting the display to only bills for items belonging to the staff worker's location. The Circulation module must also enable the display of paid bills.
- The Circulation module must support both automatic, system-generated bills as well as manual, staff-initiated fines. The Circulation module must support an unlimited number of manual fine reasons, including damaged, privilege, hold fee, ILL fee, photocopy.
- The Circulation module must support graduated fines and other billing structures.

- The circulation module must support the calculation of fines and make this information available to staff and public users (via the user's online OPAC account) prior to check in of items and the creation of a bill.

7 Holds /Demand Management (Staff and Public User Placed Holds)

1. The Circulation module must check the validity of the user requesting a hold. The Circulation module must check the user database and block users who are barred, inactive, not permitted to place holds, etc.
2. The Circulation module must examine library-level, group level, and system – wide levels of holds policies. The system must enable a library to allow only its own patrons to place holds on items. In addition, the system must enable a library to assign a higher priority ranking to its user's hold request (i.e., allow a library to state, 'Fill requests for my library patrons first, then other libraries' users'.) The system proposed must allow a definition of one or more groups of libraries that allow reciprocal holds / other library's users to place holds.
3. The Circulation Module must allow holds to be placed.
 - By staff
 - By Public users within the library
 - By remote users via the web OPAC
 - At the title or copy level
 - Over a range of materials to fulfill a "blanket hold" request (e.g. any novel by Robert Jordan)
 - Only by authorized users and only on 'hold able' materials as determined by local library circulation policies. For instance, a juvenile cannot place holds on materials, or cannot place holds on materials owned by another library within a multi library system.
4. For multi-library systems, hold fulfillment policies must consider (a) the user's hold rank and (b) the item's owning library's policies when determining the next eligible user in the hold queue.
5. vendor must describe how the proposed circulation module satisfies user hold requests for any book / item by a particular author or for several items on a specific subject.

8 Offline Circulation

1. Vendor must describe the Circulation modules standalone, graphical offline circulation feature.
2. The Circulation module's stand alone, graphical PC based alternative must allow circulation to continue in the event the system cannot be used due to system failure, communications failure, downtime required for maintenance, etc.
3. The offline circulation feature must provide:
 - Feature to alert staff when circulating items to blocked users
 - Support for item charge and discharge
 - Renewals
 - Payment collection
 - New user registration

9 Inventory

- The Circulation module must support marking items used in-house for statistical reporting. If an item has a special status (charged, on hold, in transit), a glossary must appear next to the item for displaying more item information.
- The circulation module must support the creation of a shelf list from inventory data in report output- Also, staff must be able to list inventory by item number in a report.
- The circulation module must support the use of portable inventory scanners, provided the Vendor's software is loaded to the Library's portable scanners.

D) Serials Control

1) Serial Control

A publication in any medium that is issued in successive parts bearing numeric or chronological designations intended to be continued indefinitely. Serials include periodicals; newspapers; annuals (such as reports and yearbooks); the journals, memoirs, proceedings, and transactions of societies; and numbered monographic series.

Sing, Gurudev (2007,pp.120-122) The serials control module must support the following industry standards:

- SISAC check in with SICI barcode scanning
- MARC21 Format for Holdings Data (MFHD)
- Support but not require MARC Format for Holdings Data (MFHD)
- If the library desires, automatically generate multi library. holdings data for the 852, 853, 863 and 866 holdings tags
- Holdings record follows the punctuation as described in Z,39.71
- Supports NISO Z,39.45 Claims for Missing Issues of Serials
- Support NISO Z39.55 Computerized Serials Orders, Claims, Cancellations
- Support NISO Z39.56 Serial Item and Contribution Identifier (SICI)
- Offer interface to third-party binding software application (e.g., LINC Plus)
- Retain the receiving dates for at least 105 most recent issues
- Associate printable copy-specific routing lists with users via the serials control record
- The Serials Control module must provide the ability to search for records by:
 - Keyword search of every indexed bibliographic field
 - Vendor
 - Fund number
 - Purchase order number
 - Location
 - System assigned number
 - Bibliographic utility assigned number

The Serials Control module must detect and alert operator about duplicates between firm orders and subscription for monographs in series.

2 Serials Control Record

- 1) The Library, or each library in a multi library system, may maintain its own serials control record. The serials control record must:
 - Designate whether or not to enter copy specific information into the catalog at check in
 - Establish the number of latest issues to display in the OPAC, with an authorized operator able to override this designation at check in
 - Establish custom naming patterns
- 2) Using the serials control record pattern, The Serials Check in and Control module must have the ability to generate predictions, expected issues, for each

serial. A prediction record must contain information about a particular issue such as enumeration, chronology, and number of copies expected. At the Librarians discretion, predictions may be generated as part of the receipt process once the last predicted issue has been received.

- 3) The system must allow a routing list to be maintained for each copy of a title to be received and must print a routing list for each copy received. At the time of check in system must enable an authorized operator to indicate that the routing is not to be activated.

The journals or the periodicals are the most difficult media for handling for a library. Since the journals do not have any specific periodicity and have many issues like the change of frequency, change of name non receipt of issues. Serials control adheres to the standard MARC 21 Format for Holdings Data and provides functionality for the following tasks:

- 1) Creating and maintaining holding information
- 2) Checking in serials
- 3) Predicting issues
- 4) Creating routing list
- 5) Producing reminders
- 6) Producing and transmitting claims
- 7) Managing binding tasks

3 Creating and maintaining holding information

When creating and modifying holding records, the following tags and fields are needed.

Tag 853 for enumeration, chronology and publication pattern sets the stage for the prediction of all expected issues. The fields contains three section of data:

- Enumeration Captions: Format labels that display in the OPAC, e.g. vol., no.
- Chronology Captions : Specifications as to how often the serial is published, e.g. weekly, monthly, yearly.
- Publication Patterns : Number of issues per year, frequency, when the publication year starts, when the calendar changes

Enumeration and Chronology :

In the 853, and 855 tags of enumeration and chronology.

- Six levels of enumeration (stored in sub fields \$a-\$f)

- Two levels of alternative enumeration (stored in sub fields \$g and \$h)
- Four levels of chronology (stored in sub fields \$i-\$l)
- One level of alternative chronology (stored in sub field \$m)

List of Allowable Chronology Captions :

- Four Year : Year, yr, y
- For Season : season, s
- For Quarter : quarter, q
- For Month : month, mo, m
- For week : week, wk, w
- For day : day, dy, d

Working with Serials Patterns

Creating accurate serials patterns is a difficult job, some software designed the Serials Pattern Editor to be a convenient tool for working with the complex data in the 853 tag of the holdings record. The Serials Pattern Editor is an easy-to-use interface for generating and editing patterns consisting of basic levels of enumeration and chronology, frequency, and regularity.

About Holdings Record Call Numbers

Your library can choose to include bib-level, holdings level (852 \$h-m), and /or item-level call numbers in the call number index (es). When a holdings-level call number exists, it is taken from a specific sub field of the 852, based on the value of the first indicator of the active 852 tag:

- If the first indicator is 4, \$j is used as the call number.
- If the first indicator is 5, \$l is used as the call number.
- If the first indicator is any other value, any of the following sub fields that are present are used as the call number: \$k, \$h, \$i, \$m.

4 Checking in serials

Each serials control (check in) record must:

- Be associated with a title in the catalog
- Designate whether or not to enter copy specific information into the catalog at check in

- Establish the number of latest issues to display in the OPAC, with an authorized operator able to override this designation at check in
- Accept the loading of data for titles held by other libraries and not controlled by the system for output in union list products

Record and maintain discard information, for producing automatic discard alerts and instructional slips for disposal of issues

The Serials Check-In function was designed to streamline the workflow involved with receiving serials and entering them into the system. While Information on predicted issues can be easily changed to reflect actual dates and other information at the time of check-in, Issue Prediction speeds up the receiving process of predicted arrivals by defaulting most fields. Serials Check-in handles receiving of unpredicted items with equal ease, and include a field where library staff can designate if an item is an issue, a supplement, or an index.

The Serials Check-in window has two tabs: Expected and Received. The Expected tab of the Serial Check-in window displays information about Expected issues. You must add the first issue of any serial manually, regardless of its frequency, using a template that is based on the pattern set up in the 853 tag. Expected issues are two types The Received tab of the serials Check-in window displays information about issues that are checked in and lets you reverse a check-in for a selected issue.

5 Predicting issues

Library staff can view and enter publication patterns for serial issues, supplements, and indexes. This information is used by the system to quickly catalogue expected issues of a serial when they are received, and to generate claiming notices when they are not.

Once you add the first regular Expected issue, software can predict future regular issues automatically, or you can add them manually. When the last regular expected issue is checked in, software automatically adds a new Expected issue. The software predicts basic bibliographic units based on the active 853 tag- the 853 tags with the highest link number of the holding record.

After you check in an Expected issue, it moves to the Received tab of the Serials Check-in window and is give the status Received. The status of an issue on the Received tab is always received. Serial issues must exist as Expected issues before they can be checked in/received.

You can add, modify, and delete regular and special Expected issues on the Expected tab of the Serials Check-in window.

- The status of a newly created Expected issue is automatically set to Expected
- Expected issues can have the status of Expected or Claimed.

You must add the first issue of any serial manually, regardless of its frequency, using a template that is based on the pattern set up in the 853 tag. On the Serials Check-in window, you can add two types of Expected issues:

- Regular Expected Issues: Issues that are part of the regular enumeration / chronology sequence of the serial.
- Special Expected Issues: Issues that are NOT part of the regular enumeration/chronology sequence of the serial.

Additional regular Expected issues are automatically predicted based on the information contained in the active 853 tag and the data in the serial issue template.

Special issues are never used to predict the next issue,

In the following sections, we describe in detail how you can add these issues to the list on the Expected tab of the Serials Check-in window.

Once you add the first regular Expected issue, software can predict future issues automatically based on the active 853 tag in the holdings record. Alternatively, you can add future issues manually.

When the last regular Expected issue is checked in, software automatically adds a new Expected issue. The software predicts basic bibliographic units based on the active

853 tags³/₄ the 853 tag with the highest link numbers ³/₄ of the holdings record.

Values and dates in predicted issues are incremented as follows:

- The enumeration values, if they exist, are incremented based on the information in the 858 sub fields Sa-h, \$u, \$v, and \$x.
- The chronology values, if they exist, are incremented based on the information in the 8iB sub fields \$i-m, \$w, and \$y.
- The Expected date is incremented by an interval based on chronology values. If chronology values are not present, the date is incremented based on the publication frequency in the 853, sub field \$w.

Working with Gap Issues

A “gap” issue is a serial issue that is checked in out of order, creating a “gap” in the sequence of issues predicted by the system. When the missing issue finally arrives, it can be checked in, but at this point, software checks it in as an “out of order” issue, which fills in the gap created by the gap issue.

- Displaying a message to alert you whenever you check in an issue whose enumeration does not match the enumeration of the next Expected issue
- Creating a new 863 tag when a gap issue is checked in and adding a sub field \$w value of “g” the end of the old 863 tag, i.e., the 863 tag that includes the last issue that was checked in sequence based on the link and sequence of the 853/863 tags.
- NOT creating a new 863 tag when an out-of-order issue is checked in but instead finding the gap that the issue fills and combining the checked in issue with data in the 863 tag to close the gap.

Working with Serial Notes

Serials Control supports two types of notes. holding-level notes and. Issue specific notes. Holding-level notes are part of the holdings record for a serial and are stored in the 9xx fields. You can view these notes from different access points in the system, but you can add and edit them only via the MARC Editor. Issue specific notes are notes attached to specific issues of a serial. You can create, view' and modify issue-specific notes from the Serials Check in window.

6. Creating routing lists

1. The serials Check in and control module must support both formal and informal routing lists' Using formal routing, each routed issue is charged to the first user on the associated routing list' As each user returns the issue to a designated point, the issue is discharged and then automatically charged to the next user on the routing list. With in formal routing, staff attach printed routing slips to the copy being routed.
2. With formal serials routing, the Serials Check in and control module must consult each user's priority rank when establishing the order of recipients' Users with higher rank should appear above lower ranked users within the routing list.

3. The Serials Check in and Control module must be able to maintain separate routing lists for each copy received for a serial.
4. The Routing Function can help libraries manage routing lists. Serial can be routed by a printed list which is produced at the time of check-in' Alternatively, each serial issues can be treated as a circulating item, with a built in reserve list. As each person finishes with the item is it sent to the library to be forwarded to the next person on the list.

A holding routing list is attached to a holdings record and is used to identify a set of patrons who want the serial issues circulated to them. Each patron (or routing destination) on a routing list must have a patron record in the database. Virtua support both a holdings routing list and a holdings issue routing list. The holdings issue routing list contains units information for a specific issue and offers a printable format.

In addition to holdings routing lists, software supports patron routing lists, where you can view a list of all the serials that are routed to a particular patron.

A holding routing list indicates the patrons who should receive some or all issues of a serial that have been checked in. In other words, a holdings issue routing list applies to the entire holdings record, not just to a specific serial issue.

Creating and Displaying a Holdings Routing List

For any holdings record, you can create or display a holdings routing list.

7 Producing reminders

Reminder records in Serials Control serve several functions. They let you track. 1) new serial titles that have been ordered but not yet received, 2) serial issues that have not arrived by the Expected date, and 3) issues that are claimed but not received by the appropriate date based on specified claim intervals.

Different types of reminders for different situations. There are two main types of reminders:

- Acquisitions Reminders
- Serials Reminders

For Serials reminders, there are three subtypes:

- Check-in Expected Reminders
- Claims Expected Reminders

User defined Reminders

8 Working with serial claims

- The Serials Control module must flag items as missing, overdue, duplicate, or to be retained for reconsideration.
- The Serials Control module must enable an authorized operator:
- To automatically generate claim notices at interval is specified, in printed and machine-readable format
- To add a claim to the claim list for a title by filling in a screen work form
- To send as many claims as desired for a missing issue or copy
- To specify the text of each claim
- To determine claim action dates by expected receipt dates combined with an operator specified claim interval
- To change the claim interval for each title at any time
- To identify issues requiring second and third claims according to library determined time lags that may be defined for various item types
- To identify items for which three claims have been issued without a response being recorded, and make them available for staff review to determine further action
- The Serials Control module must enable recording specific details of responses to claims.

Normally, you would use the claiming function in Serials Control to claim a specific Expected issue that has not been received, whereas you would use the claiming function in Acquisitions to claim a new serial order, the first issue of which has not yet arrived.

- Issue Claims : Create claims for serials that have not yet been received. You can create a claim either for a specific serial issue or for an entire holdings record.
- Transmit Claims : Send claim letters to vendors by means of printing and mailing.
- View Claims : See a list of all outstanding claims that have not yet been transmitted.
- Delete Claims : Removed from the claims list claims that have not yet been transmitted

9. Managing binding tasks

The Bindery Function allows library staff to change the material status of serial issues that have been bound into a volume to "Bindery" or its library-defined equivalent. This automatically changes the holdings record and replaces the issues item records with a single item record for the volume. Binding control allows your library to manage received journal issues and to track which issues should be sent to the bindery. The features binding control functionality that consists of three main aspects; 1) binding reminders, 2) display on the Serials Check-in window, and 3) a report on those issues to be pulled for binding. (Bilal, Dania 2002, pp.19-28)

E) OPAC / Web OPAC

1 OPAC

OPAC stands for Online Public Access Catalogue. It is computer based and supported library catalogue bibliographic database) designed to be accessed via terminals so that library users may directly and effectively search for and retrieve bibliographic records without the assistance of a human intermediary. OPAC usually allows searching by author name, title, and subject. OPAC proved access to the library's holdings via a computer monitor, replacing the traditional card catalogue.

(Sing,Gurudev 2007, pp.131-132)

Features Summary

Online Public Access Catalog must provide searching and locating features for your online public access catalog. Specifically, OPAC offers the following key features:

Patrons can perform various levels of searching such as Browse, 'Heading, Keyword, Control number, and Expert

- Patrons can select which index they wish to search such as title, author, and subject.
- Z39.50 compliance, which allows you to search other Z39.50 compliant databases.
- Patron empowerment such as searching/viewing of own patron record.
- Filtering of searches.
- Browse searches are accumulated on tabs.
- Access to record views such as Full, MARC, Holdings, Item and Status tabs.
- Multimedia access via MARC 856 tag.

Browse Search:

The browse search is useful for searching the OPAC when the user wants to narrow a search from a broad topic to a specific topic or does not know an exact term.

Search Strings

- Author, Instructor, Patron: Last name first
- Title: Do not include A, An, The as the first word
- Subject: Type the category as it appears in the Library of Congress Subject Headings
- Course ID searches: Use the official name and number

View a Record

The View Record window provides information about the title/item that was selected from the List of Titles. Information concerning the record is displayed on tabs.

Different tabs are available for each record type in each different window:

View Bibliographic Record Window

Full tab

Items tab - Access to Item Information windows

MARC tab

Statuses tab - Acquisitions information

Holdings tab - Serials records only

The Full tab of the View Record window may also contain hyperlinked text.

Multimedia Links: If a bibliographic record is associated with multimedia files (856 tag), the URL of each multimedia file is displayed as a hyperlink.

Search Hyperlinks : The Full tab view may be configured to display the contents of any bibliographic tag as a search hyperlink. When you click the hyperlinked field, Virtua launches a search as specified in the configuration.

Output Records

Copies of bibliographic records can be obtained from the List of Titles, View Record, and MARC Editor windows in three ways:

1. Print
2. Save
3. Email

Print Record(s)

1. Open the record in the List of Titles, View Record, or MARC Editor window.

2. Highlight the Print option from the File pull-down menu or right click the mouse and select Print.

Save Record(s)

1. Open the record in the List of Titles, View record, or MARC Editor window.
2. Highlight the Save option from the File pull-down menu or right click the mouse and select Save; The Save Records window will appear.

Email Record(s)

1. Open the record in the List of Titles, View Record, or MARC Editor window.
2. Highlight the email option from the File pull-down menu or right click the mouse and select Email; The Email Records window will appear.

Keyword

Keyword searching has the flexibility to allow the user to create simple searches and yet allows the experienced user to build sophisticated searches through Precision Searching and Filtering.

Precision Searching provides enhanced control through expanded keyword search capabilities using the following tools:

- Keywords
- Wild cards
- Phrase searching
- Search Categories (including 008 Fixed Fields)
- Boolean Operators
- Proximity searching
- Parentheses
- Full Text searching

Key Terms

- Boolean Operators
- Filters
- Keyword Search
- Refine
- Search Categories
- Search Strings
- Shelving location
- Sub-location

Truncation

With keywords, you can specify left, right, or medial truncation along with wild card searches.

Boolean Operators & Search Operators

Boolean operators (symbols) or Search Operators (terms), are used to link two or more keywords. In Virtua, these operators are available on dropdown menus or can be used within the text boxes as part of search string. If entering them as part of a search string, you must put a space before and after each operator and use a symbol such as & or +.

Symbols	Terms
&	AND
+	OR
-	AND NOT
& x	NEAR : Proximity, where x is the number of words between the search terms, for example : t : Gone & 2 wind will retrieve Gone with the Wind.

Parentheses

You can use parentheses anywhere within a query string to group a set of operators and search terms. Search strings within the parentheses will be processed first and then those results will be combined with other terms.

Proximity Searching

Bibliographic keyword searches let you specify proximity between search terms using either the NEAR operator that appears in the search operators pull-down list box or with the &xx operator. The value of the x indicates the number of words between the two terms. For example, &3 indicates proximity of three words.

Example Search

t:ancient &1 t:rome

Retrieves

Records in which ancient appears within one word of Rome in any indexed title field are found.

Search Categories

When specifying a search category, type the category code, followed by a colon and the search term. Do not put a space between the category code and the colon or the colon and the search term.

Example Search

a: Bronte

Retrieves

Records authored by Bronte, Charlotte; Bronte, Emily; etc. are found.

Control Number Search

Control numbers are unique numbers assigned to library items or attached to catalog records and subsequently are used to identify those items or records.

Key Terms

- Authority MARC Record
- Control Number
- Control Number Search
- Holdings MARC Record
- Item Record
- Patron Record
- Vendor Record

(Cohn,J.M.&Kelsey,A.L.1997,pp.12-28)

2 Web OPAC

1 Broadcast Searching

Broadcast searching option that can be integrated with Vendor's web OPAC to enable users to conduct simultaneous searches across both 239.50 and non-239.50 targets including:

- Commercial abstract and index databases,
- Library catalogs,
- Search engines (like Google, Teoma, etc.)
- Speak to each source in its native language to provide superior results.
- Keep access to resources reliable with continuous updates through subscription-based Resource Plugging
- Deliver results merged into a single interface to enable users to limit searches, sort, reduplicate, and filter.

2 Open URL resolution

Open URL Resolve must resolve an Open IIRL initiating with the vendor's proposed web OPAC, or with third-party Open URL products, such as Ebsco HOST, etc., to identify and retrieve information related to the original citation, even though such information may be scattered among different providers.

Open URL Resolve must return and resolve, wherever available, information from:

- Full-text document databases
- Abstract and index databases
- Citation databases
- Content databases with reviews, tables of contents, first chapters, summaries, author biographies, etc.
- Online library catalogs - both local and remote
- Interlibrary loan and document delivery services
- Web sites
- Electronically accessible resources of all kinds free or licensed, to which the library has access.

3 Web Report

- The Reports module must be fully integrated with all other system modules, and provide a comprehensive suite of library-customizable report templates.
- The Reports module must enable an authorized operator to schedule production of report output at a specified date and time and on a regular periodic basis, such as daily, weekly, monthly, and at pre-specified times.
- The Reports module must enable an authorized operator to view completed reports on screen or to e-mail or print the report, at the operator's convenience.
- On any database reports involving materials, such as new accessions lists, shelf lists, high / low circulation lists, and bibliographies, the operator can select items for inclusion based on any combination of bibliographic information (using full Boolean word and phrase searching) and on any combination of control information, for example collection, current status, number of circulations, number of holds, classification, and accessions date.
- The Reports module must enable an authorized operator to specify the starting date-and-time and ending date and- time that the report is to cover on reports involving historical data.
- The fully integrated Reports module must use the same user interface as other modules. The Reports module must:
 - Provide lists, counts, and statistical reports for each purchased module
 - Provide row, column, and grand totals in applicable reports

- Provide reports for all record types within the proposed system
- Track statistical and management information by counting various staff processes to measure productivity, identifying items which are likely candidates for weeding, or tracking fund information for budgeting
- Perform housekeeping tasks by changing the status of groups of users, or removing users or items in batches when necessary
- Allow authorized operator(s) to select, customize, name, save and schedule reports
- Allow staff to display and/or e-mail finished reports.

(Bilal, Dania 2002,pp.36-38)

4 What is Z39.50?

Z39.50 is an international standard for communication 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 is becoming increasingly important to the future development and deployment of inter-linked library systems.

Implications for libraries

The implications for the library and information services are profound. Over the next few years, services will become “Z39.50 enabled” in much the same way that library OPACs have become “Web enabled”. Some possible effects on library operations are explored here:

OPACs

Many OPACs have been Z39.50 for a few years now. This is the basic benefit of Z39.50 operation for a typical user.

The typical (simplified) search process involved in a Z39.50 session is as follows:

- OPAC user selects Target library (Z-server) from an OPAC menu.
- OPAC user enters search terms
- OPAC software sends search terms and Target library details to a “Z-client” a piece of software usually running as part of the library system.

- Z-client translates the search terms into “Z-speak” and contacts the Target Library’s Z-server software.
- There is a preliminary negotiation between the Z-client and Z-server to establish the rules for the “Z-Association” between the two systems.
- Z-server translates the “Z-speak” into a search request for the Target library’s database and receives a response about numbers of matches etc.
- Z-client receives records
- Records are presented to the OPAC interface for the user.

(Singh,C.P. 2008,p.133)

Cataloguing :

Searching for and downloading bibliographic records using a Z39.50 tools is simple and very efficient since multiple source can be searched simultaneously and records easily compared. The cataloguing process involved in a Z39.50session is as follows:

Modern Z-clients can send requests to several libraries simultaneously either the same request or different ones. This feature allows tremendous time saving when searching for rare items or for large numbers of records.

The basic record format user for interchange is MARC. The z-client is presented with a MARC record for display and possible further processing. All libraries “trade” bibliographic records one way or another' Z39'50 opens up that trade by making standardizing the basic search and retrieve functions'

Union catalogues:

Union catalogues - combined catalogues of Several libraries - have been a valuable tool for decades within groups of otherwise separate libraries wanting to cooperate for inter-lending, co-operative purchase, and general reader service. They are, however, difficult and expensive to manage' Using Z39.50 enabled catalogues and OPACs, a Virtua union catalogue can be assembled without any changes to the individual organization's methods and procedures. A user may sit at an OPAC screen and search several catalogues

Simultaneously as if they were one. Useful material and its location can be displayed with no additional work by library management apart from set-up of Z-clients. Ad-hoc groupings of libraries can be assembled to suit the needs of the users without any technical or administrative fuss.

Inter-Library Loan (ILL):

The immediate benefit of a virtual union catalogue means that ILL is made easier the user can immediately identify the location of required items. The extended services of Z39.50 allows systems to arrange for the delivery, including account verification and billing, of an item to the enquirer. In a Z39.50 enabled ILL future, libraries will be able to search and order items in one operation and deal directly with whichever library serves their needs all via their own library OPAC search tools.

(Aswal,R.S.2006,pp.136-138)

CD-ROM access :

Despite the steady migration of CD-ROM information providers to Web based. services, CD networks will be a feature of library services for some time. Using Z39.50, it would be possible to search each database using a single familiar interface and, additionally, several databases at the same time.

Selective Dissemination of Information:

Z39.50 allows the user to specific search statements to be saved and run at intervals. Thus the user may for instance identify useful libraries and information resources and set up SDI profiles using a single interface. Searches can be automatically run when required and the results downloaded from the database to a specified destination e.g. fax or e-mail.

F) Extended Services:

Automated library provides extended services to satisfy the needs of the users. Some of the services which most of the university libraries provide are:

1 Reservation service

In case a document has been loaned, then a user, who needs it, can get it reserved. So that when the document is returned. then the user can be informed and he / she can get it issued. Online reservation facility should be there as many users need not come to the library to reserve a book, in that case online reservation facility helps them a lot.

2 Reference service:

Reference Service is the hub of all the activities of a library. Reference service is ' a sympathetic and informed personal aid in interpreting library collection for study and research. Samuel Rothstein gave the following distinguishing criteria of reference

service. The provision by librarians of personal assistance to individual readers in pursuit of information

The recognition by the library that such assistance is an indispensable means of a definite responsibility to provide it. The existence of a specific administrative unit to furnish such assistance comprised of personnel specially equipped in the techniques of reference work.

According to Dr. Ranganathan, "Reference Service is the achievement of modern humanism in library science and it is a contact between the right reader and the right book at the right time and in the right personal way".

The objectives of Reference Services are:

- Providing of information using reference books in response to specific queries of the users.
- Giving instructions in the use of, and guidance in the choice of documents.
- Giving referral service for inquiries which the information centre/ system cannot answer.

According to Dr. S. R. Ranganathan there are following four kinds of reference service.

These are

- Initiation of the freshman.
- General help to the general reader
- Short-range Reference Service.
- Long-range Reference Service.

Initiation of the freshman

When a new reader becomes a member of the library he is initiated into the technicalities of the library and large stock of the library. If he is left totally unnoticed, there is a danger that he may feel bewildered and may not be able to use the library resources. It is essential to create confidence in him so that he uses the library without doubt or fear. He should be properly guided as to the location of various kinds of books.

He should be told the method of finding out the requisite reading material. Readers of this kind should be fully guided as to how to become a member of the library and to use, its resources.

General help to the General Reader

Readers of this kind are not new to the library but they still want some kind of help so that they may be able to get their requisite reading materials. They must be told as to how to use the catalogue and various sequences of the library. It means that such readers do not ask any particular question but they would like to know the methods of using the library resources in a better way.

Short-Range Reference Service

Short-range Reference Service consists of providing readymade answers to particular questions- Time is the essence of his kind of service. No special effort is to be made to find out the requisite information.

Long-range Reference Service

This kind of service is just the reverse of short-range reference service. To cull out information, lot of time has to be devoted and the sources from which information is got out are not ready reference books but lengthy reports and treatises, which need, prolonged search for finding out the adequate and proper information

3 Referral service

Normally reference staff attempts to bring users in contact with documents likely to contain required information. Similarly reference staff can tell about the persons and institutions, which may be able to provide information to the users seeking information.

4 Indexing and abstracting service

Indexing and abstracting, which follow preliminary selection and acquisition of documents, involve the process of assigning descriptors to each document to identify the data or information. This would involve a comprehensive and highly condensed presentation of information. This results in indexing and abstracting services/ products that indicate to a user the type of data/ information contained as well as parameters of data points. Some of the products emanating from these services are, Abstracts of technical papers, Patent abstracts, Digest for management, Digest for technical division. Digest for operator, technical note etc.

(Nair, R.R. 1992,p26)

5 Current awareness service (CAS)

Current awareness services are a good way to track recent developments on a specific topic or keep up-to-date in a specific field of interest. It supports your research, teaching and studies is vital in this information intensive Internet age. It is essential that users manage the amount of information using a range of current awareness services. Following types of current awareness services.

(Nair, R.R. 1992,pp.249-251)

6 Electronic Table of Contents (TOC) Service

Electronic Tables of Contents service is provided by the Library to keep you up to date with the latest articles and information in your specialty. It contains the title, author, journal name, inclusive page numbers etc. ISBN, Elsevier, Sage publication, SARA, ACS, Springer and many other publisher are providing this types of services.

7 SDI (Selective Dissemination of Information) Service

H. P. Luhn is a pioneer in this field. According to him, SDI is that service within an organization which concerns itself with channeling of new items of information from various sources to those points within the organization where they can usefully serve someone's interest. It endeavors to prevent indiscriminate distribution of new information and avert the resulting danger of not communicating at all” The basic concept behind SDI consists of matching information/ documents with the profile.(interest) of each individual of the clientele. The profile can be single user or a group working on the same project or some limited subject field. Those item matches are brought to the attention of the user. In an automated system this service can be performed effectively. The aim being that user should neither be provided too much information nor made to miss information essential towards his requirements.

The steps involved here are:

- Users Profile,
- Documents Profile,
- Matching,
- Notification,
- Response or Feedback,
- Readjustment or rejuvenation of profiles

8 Electronic Clipping Services

This service identifies news as it is added to the database. The user is prompted to indicate the files to be monitored, the search strategies to be used and the name of resulting “folder”. Each folder can have up to five search statements. User is asked to specify the delivery options for the clippings. The user has the option to review the headlines of the clipped articles before viewing the full-text. Clippings are kept in a folder for 30 days if not deleted by the user before then. It can be delivered by fax or email.

Publications

Publications of the library or of the parent institutions can be on the Web page. Many universities having printing press and publication division. If the library has an independent Web page along with that of the institute, a link may be provided to the publication's page. Alternatively, the library can maintain in its Web page information about the university publications.

9 Supporting services

The supporting services include Translation Service

The non-English language portion of the world’s scientific and technical literature required by scientists, engineers, and technologists probably amounts to as much as 50 percent. At present, the most expedient way to make this body of foreign language material available to the scientists and engineers of the system is by the provision of a translation facility.

10 Reprography Service

The art and method of document reproduction broadly defined as “Reprographic Methods”, have come to stay as a basic necessity in every aspect of modern life, more so in the field of communication and dissemination of information. The advantage of reprography has found innumerable applications in information centers and their scope is practically unlimited. The advantages are:

- Procuring copies of out-of-print material or unpublished works such as laboratory notes;
- Securing the contents of valuable documents;
- Publication in limited editions;

- Saving storage space;
- Acquisition of copies of portions of books, periodicals, etc. without having to acquire the whole of the original etc.

11 Printing Service

Apart from providing access to documents by the supply of copies, the reprography unit would also be bringing out the abstracting periodicals, current awareness services, cover-to cover translations and other information publications. It may also be required to bring out the organizations Technical Journal, Conference Seminar and Symposia papers, Proceedings etc. Therefore, printing facilities are required to be set up. In a computer-oriented automated environment the lithography system can make use of computer printout directly.

12 Instruction Service

This service can also be called as User Education. This service aims to provide knowledge and skills necessary to find out his own way. The objectives of user education are:

- A general orientation to available facilities and resources
- The teaching of basic research skills and strategies and
- The teaching of the organization of the literature in various disciplines, as well as basic reference tools in each discipline.

Thus the achievement of the objectives will facilitates recognition on the part of users of their own information needs as formulation of those needs.

The user education constituted of the four interrelated components. These are

- User awareness
- Library orientation,
- Interest Profiling,
- Bibliographic instruction

Once users have been made aware of the library as a primary source of information, then they must be oriented of library facilities. Thus user awareness is the initial stage preceding library orientation. Interest profiling should precede Bibliographic instruction. Library orientation and bibliographic instruction form the basic components of user education. Library orientation precedes bibliographic instruction. Library orientation is supposed to lay groundwork for bibliographic instruction whereby the users can become effective users.

13 Bulletin board service:

Very often, researchers and academicians need to discuss their individual findings and study with fellow academicians. The quickest and easiest way of doing this would be to have a type of Discussion Forum or Bulletin Board Service on the Internet, which would be a kind of bulletin board for members to “pin their notes” for others to see. Generally Bulletin Board service is used to invite people's interest in special resources and services: to house interests in selected books on a particular topic; to present short, graphic summaries of important national and local news; and to announce programs and Lectures. The bulletin boards should be installed in places where too many readers come.

14 CD-ROM service:

CD-ROM is a high capacity storage media' which is widely used in libraries due to its various advantages. Libraries store different reference books as they take lots of space on the shelf and also because of their heavy weights. Different abstracting and indexing journals are now available on CD ROM, For example, LISA (Library and Information Science Abstract), ISA (Indian science Abstract), etc. The libraries those have infrastructure to use CD-ROM provide this service to the users. It is a way of providing bibliographic services using CD-ROM. Another reason of libraries using CD-ROM is that some documents are available in CD-ROM. To give access to those books libraries provide CD-ROM service.

(Vaidya Sagar,P 2005,p.136)

15 Online book suggestion:

This is a good service usually offered by the university. One can suggest a book for the library to acquire via e-mail. For this the person in charge of this matter should have mail facility. The user should provide the following items of the documents to be acquired.

- The name and department of the user who is suggesting.
- The status of the user (e.g. undergraduate, graduate, faculty, staff) with e-mail address.
- For each item suggested, one should provide Author (required), Title (required), Publisher, Year of publication, Price, ISBN number.

(Lakshmi, S.2010,p.163)

16 Shared cataloging:

Even when using CIP or one of the CD-ROM or Web based cataloging products, smaller libraries seldom have adequate time or other resources available to maintain consistently high quality cataloging. In a shared system this cataloging can be much easier, saving a considerable amount of time and money. For example, if five libraries in the shared system purchase the same title, only one library has to actually 'catalog it. Once a title is cataloged, other libraries can simply enter their holdings data, such as the call number and collection code ("Refi", "Juv," etc.). The benefits of not having to catalog most acquisitions, nor file catalog cards for them, can be significant.

G) Digitalization System

1 Digitalization System

Digital libraries are revolutionizing the way institutions can store, organize and deliver information. The first responsibility of a digital library system is that it manages the electronic assets in a way that provides maximum security while providing flexible, appropriate levels of access to everything in our collection. It must also do as much as possible to ease the task of maintaining the storage and archiving of the assets.

The data model for the digital objects is crucial to the design of the entire system. Essentially, each digital object is a free agent in the system, carrying all of the information needed to understand and use it. E-texts, images, collections, etc. are all represented as independent objects in the system, as are thesauri, union lists, indices and other types of information structures. The repository architecture must be able to completely implement the data model for objects that are not resident on our systems as well as for those that are. For objects that are not ours but for which we are acting as the primary gateway, the repository should be able to maintain the metadata package and methods for each object and the registry should be able to uniquely identify it. We should be able to create our own behaviors for the remote objects that make them usable in our system.

(Lakshmi, S.2010,p.6)

2 What is a Digital Library?

Digital libraries emerged. from research and development activities in the decade of the 19g0s. For Duguid, a digital library is “an environment to bring together collections, services, and people in support of the full life cycle. of creation, dissemination, use, and preservation of data, information, and knowledge.” This definition seems particularly appropriate for a higher education community attempting to balance the flexibility of virtual space with the power that physical space brings to the learning process.

Definition

“The concept behind Digital Libraries (DL) has its roots in what is the philosophy of libraries of disseminating knowledge for all”.

- *H.G. Wells*

“Digital libraries are organizations that provide the resource including the specialized staff, to select structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community or set of communities”,

- *Donald, Waters*

“Controlled collections of information bearing objects (IBOs) that are in digital form and that may be organized, accessed, evaluated and used by means of heterogeneous and extensible set of distributed services that are supported by digital technology”

-*Terence R. Smith*

“System providing a community of users with coherent access to a large, organized repository of information and knowledge. The digital library is not just one entity, but multiple sources are seamlessly integrated.”

-*Clifford Lynch*

(Singh, C.P. 2008,pp.103-104)

3 Packaged DL Software

- E-Prints from the University of Southampton
- Dspace from the Massachusetts Institute of Technology & IIP alliance team
- Greenstone from University of Waikato
- Fedora from University of Virginia and Cornell University
- VITAL

NDLTD project has international members from over dozen countries sharing electronic theses and dissertations. Eventually this will become one of the world's largest digital libraries, with the potential .of 200,000 multilingual hypermedia works being added each year.

NSDL The basic objective of NSDL is to catalyze and support continual improvements in the quality of Science, Mathematics,' Engineering and Technology education.

3.1 Dspace

Dspace is open source software for building and managing Digital repositories. Developed jointly by MIT Libraries and Hewlett-Packard (HP), is freely available to research institutions as an open source system that can be customized and extended. Dspace is a digital institutional repository that captures, stores, indexes, preserves, and redistributes content in digital formats. Institutional Respositry is a set of services that a research institution / organization/ university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members Typically, Dspace has been deployed for Institutional Repositories of publication, thesis and dissertations. There are several groups working on ext6nding its capabilities such implementation of ontologies in search interface and for submission module, customization for management of electronic theses and dissertations and for localization and international of the package for the world languages.

DSpace is designed for ease-of-use, with a web-based user interface that can be customized. The DSpace system provides a way to manage research materials and publications in a professionally maintained repository to give them greater visibility and accessibility.

(Aswal,R.S.2006,pp.185-189)

3.2 Fedora from University of Virginia and Cornell University

The Flexible and Extensible Digital Object and repository Architecture (Fedora TM) system, designed by the Cornell Digital Library Research Group, showed great promise as the core architecture of a digital repository system when we first reviewed it in a 1999 D-Lib article. The University of Virginia Library' s Digital Library Research and Development Group CILR&D) is collaborating with Cornell to

develop Fedora under a \$1,000,000 Andrew W. Mellon, Foundation grant, which has also funded a \$1,400,000 Fedora Phase 2 Grant.

In the first phase of the project, UVa implemented a prototype repository based on the Fedora™ architecture (see the July 2000 D-Lib Magazine article) using a relational database combined with Java servlets that provide a web interface. The first phase UVa production repository is scheduled to launch in 2004. Fedora™ is intended to leave a great deal of room for a repository to develop to serve local needs while providing enough structure to guarantee interoperability with other repositories. See Building an American Studies Information Community to read a description of a Mellon-funded project that is developing collections and disseminator prototypes for the UVa Repository, and visit the first phase American Studies Information Community. Version 1.0 was released under on May 16,2003.

VTLS, Inc. has announced the release of VITAL, which provides VITAL developed workflow extensions, management utilities and enhanced searching capabilities” built on top of the Fedora repository system architecture.

3.3 VITAL

VITAL provides all types of information is not only transmitted by words-but also by photographs, slides, maps, posters, and videos, sound and movie -just to name a few. By incorporating these into your digital collections, you are providing the public with a rich, new source of information to explore. The following features of the VITAL:

- Instant access to digital content anytime, from anywhere, to anyone with a web browser
- Tools to facilitate the digitization of all materials including, rare objects or historical documents
- Simultaneous access to diverse content and metadata through Fedorar^{MT} digital objects

Digital Image Capture

Digital image capture divides the image into a grid of tiny regions, each of which is represented by a digital value which records color information. The resolution of the image indicates how densely packed these regions are and is the

most familiar measure of image quality. However, in addition to resolution you need to consider the bit-depth, the amount of information recorded for each region and hence the possible range of tonal values. Scanners record tonal values in digital images in one of three general ways: black and white, grayscale, and color. In black and white image capture, each pixel in the digital image is represented as either black or white (on or off). In 8-bit grayscale capture, where each sample is expressed using 8 bits of information (for 256 possible values) the tonal values in the original are recorded with a much larger palette that includes not only black and white, but also 254 intermediate shades of gray. In 24-bit color scanning, the tonal values in the original are reproduced from combinations of red, green, and blue (RGB) with palettes representing up to 16.7 million colors.

4 Digital Text Capture

Although it may seem odd to discuss digital text in this context, there are some important, if indirect parallels between the principles described above and those that govern digital text capture. Clearly in capturing digital text one does not sample the original in the same way that one samples audio or images. However, the process of text capture does involve choices about the level of granularity at which the digital representation will operate. In capturing a 20th century printed text, for instance, a range of different „data densities,“ is possible: a simple transcription of the actual letters and spaces printed on the page; a higher-order transcription which also represents the nature of textual units such as paragraphs and headings; an even more dense transcription which also adds inferential information such as keywords or metrical data. Other possibilities arise in texts that have different kinds of internal granularity. In the case of a medieval manuscript one might create a transcription that captures the graphemes - the individual characters of the text but does not distinguish between different forms of the same letter (for instance, short and longs). Or one might capture these different letter forms, or even distinguish between swashed and unswashed characters. One might also choose to capture variations in spacing between letters, lines of text, and text components, or variations in letter size, or changes in handwriting, or any one of a number of possibly meaningful distinctions. These distinctions, and the choice of whether or not to capture them, are the equivalent of sampling rates and bit depth : they govern the amount of information

which the digital file records about the analog source, and the resulting amount of nuance that is possible in reusing and processing the digital file.

5 Equipment for Digitization

5.1 Computers

Computer hardware and software is constantly changing. Fortunately, currently produced computers are fast enough to handle almost any scanning and other digitization tasks. Here are some minimum guidelines for computer hardware :

Pentium III or IV 800 Mhz or better

iMac or Power Mac G4 600 Mhz or better

RAM-intensive operations such as image processing and video editing can take many seconds or even minutes in computers with dozens, rather than hundreds or even thousands of MB of memory. Design a test sequence to allow you to determine whether the machine will achieve your objectives.

256 Megs of Ram or more

Large hard drive (20+ Gigabytes)

CD-R or CD Drive

CD ROM Drive (for copying CD media)

Zip Drive

12.6.2 Display devices

Large Monitor (19 inch or larger)

Do not neglect display where image work is concerned. Your computer display is likely to be the most used output device and a good quality display of sufficient size is important for effective and efficient quality control and comfortable working conditions. The display should ideally be 19" or 21" inch diagonal viewable measurement. Upgrading to a 21" display is a worthwhile investment. If the monitor is to be used for rigorous quality control ('soft proofing'), ensure that the display has hardware and/or software calibration, that the calibration mechanisms are compatible with the capture devices, and that standard color" management profiles can be used. It is also important to control or calibrate the ambient environment along with the display device. If you are considering LCD flat panel monitors, they are available with analog or digital signal processors. The digital signal displays are better but not always compatible with all systems and video cards, so research the hardware carefully.

(Singh, C.P. 2008,pp.6-18)

5.2 Printers

Printer resolution is a measure of the printer's ability to produce individual dots, and is usually expressed as dots per inch (dpi). Printer resolution may also be expressed as lines per inch (Dpi.)

The variables of paper, ink, storage environment, and use all determine the life expectancy of their output.

5.3 Audio equipment

Film can be transferred onto videotape for digitization via a transfer box or multiplexer. Both of these options depend upon the material being projected in some way. Transfer boxes project the image into a box containing a mirror and onto a rear image projection screen with the video camera mounted on the other side of the box. The resulting video is subsequently digitized. These transfer boxes are not expensive, but do not in general produce quality as high as a multiplexer because they introduce generational loss.

(Vaidya Sagar,P 2005,p.207)

A better solution is to use a multiplexer. In this device the projector and camera are mounted on a single table. The image is projected by a set of lens and mirrors, directly into the camera without the need for a projection screen. This has advantages for image clarity. In both processes quality, suffers because it introduces an extra production generation into the reformatting of the analog material.

As there are fewer analog audio formats, these provide less of a problem than moving images. Compact cassette players, 33 and 45 rpm record players are still widely available new. Even record players with a 78 rpm speed can still be purchased new. The other formats present a greater challenge. If digitizing the sound as played on period equipment is important the tone arms of phonographs and gramophones can be customized to provide an appropriate feed.

5.4 Storage Devices and Systems

While storage devices have grown steadily since their invention and show no signs of reaching a plateau, storage demands have kept pace with them, and file storage remains a concern for delivery and for backup. consider that 150 24- bit color TIFF files at 400 pixels per inch (ppi), plus 150 JPEG files at 100 ppi, together with

associated metadata, would occupy 5 - 6 GB. In 2002, this is approximately the entire capacity of most standard PC internal hard drives.

5.5 Software

For most scanning applications, Adobe Photoshop is the de facto standard and is recommended. Photoshop is more expensive than some other imaging packages, but the quality of images produced by Photoshop has been shown to be greater than those produced by other software. Scanners also come with a driver application that operates the scanner and sends the image to Photoshop. The features included in these applications are dependent on the scanner manufacturer, but they usually include the ability to preview, discerning functionality for halftone (dot-based) images, and color correction. (Nair, R.R. 1992,pp.180-187)

6 Scanning

The process for scanning documents is:

Create a master image, saved as a TIFF (Tagged Image File Format) File
Generate derivative or access images from this master image save the master images onto CD-R disks and mount the access images on a web server for public access For manuscripts and printed materials use the following guidelines:

300 dpi minimum

24-bit RGB color

Sharpen lightly if needed using unsharp mask filter (be careful not to use too much!)

7 Cropping

Cropping depends on the material being scanned. For most images, any background is cropped out leaving just the object. Photographs can be cropped to the edges of the photograph, and printed books can be cropped to the edge of the page. It is desirable for items such as diaries to crop outside the edge of the object, so that your image looks like a picture of a book rather than disembodied pages.

8 Image derivatives

Several common types of derivative images may be created from master images.

GIF (Graphics Interchange Format) This format is only currently used for creating thumbnails and 1 bit bitonal (black & white) images.

JPEG (Joint Photographic Experts Group) This format is widely used for creating medium and high resolution images for Web delivery.

PDF (Portable Document Format) From Adobe, this compressed format requires users to have the Adobe Acrobat Reader software installed on their machine (a common default on newer machines and browsers). It offers the benefit of resizing on screen and easy printing of documents. This format is most commonly used for printed documents.

9 Text Encoding

Documents, books, and other written and printed materials may also be transferred into text format as part of the digitization process. This can be done either through OCR (Optical Character Recognition) Technology or by hand transcription, commonly called “rekeying”

Because text transcription and encoding is very expensive and time consuming, individual projects will want to consider whether or not to make the investment. If the documents have high historical value and search ability is an important criteria of digitization, then transcription and encoding are the preferred method of achieving this goal.

H) Metadata & Dublin Core

Metadata is literally “information about the data”: information created about the source material and the digital version to record the essentials of their identity, creation, use, and structure. Their purpose is to facilitate the discovery, use, management and reusability of digital material. Metadata can be usefully divided into three categories: descriptive, administrative and structural. These are not rigidly bounded groups and they frequently overlap.

(Lakshmi 2010, p.7)

Descriptive metadata describes ,and identifies information resources, to facilitate searching, retrieval, and management. It typically includes basic bibliographic information such as the creator, title, creation date; catalog information such as accession or other Identifying numbers; and topic information such as key wording. Examples of descriptive metadata include Library of Congress Subject Headings, Categories for the Description of Works of Art (CDWA) and the Dublin Core metadata set.

Administrative metadata is used to facilitate management, tracking, migration and re-use of digital assets. It typically includes information on creation, quality control, rights and preservation. See Cornell University's "Web Hub for Developing Administrative Metadata for Electronic Resource Management,"

The term "technical metadata" is also used in a similar sense to indicate metadata about data capture and the technical characteristics of the images. Structural metadata describes the internal structure of digital resources and the relationships between their parts. It is used to enable navigation and presentation

1 Text metadata

Metadata for textual resources is in some ways the most straightforward to create, because it can be captured in the same format as the digital object it self and can be included directly in the digital file, for instance as a header section in an SGML / XML - encoded document. EAD, TEI, and HTML all include a header element of varying scope; the HTML header provides for the inclusion of basic Dublin Core metadata terms, while the EAD and TEI headers provide for more extensive information about both the electronic file and the information it captures or describes.

2 Image metadata

Metadata for still images may be stored in a file header or in a separate database or file. Because images themselves, unlike text, cannot currently be searched very effectively for content, metadata is doubly important for retrieval purposes, as well as for internal project tracking, management, and documentation. The METS standard can be used to bring together the different types of image metadata required for different project purposes. It can also be used not only to document individual images, but also to represent the relationships between multiple images that together constitute a single digital object (for instance, high-resolution archival images, thumbnails and delivery images at lower resolutions images of particular details at higher magnification).

3 Audio-visual metadata

As with still images, metadata is crucial to digital audio or video, and the principles of metadata interoperability and documentation standards are as important to digital AVmedia as to still image and text media^ Metadata for digital audio and visual resources can be used in much the same way as metadata for complex digital objects composed of still images. A metadata standard like METS (with the

appropriate extension schema) can be used to describe the structure of an audio-visual digital object : for instance, a group of original taped interviews and a final version edited for delivery.

4 Dublin Core

The Dublin Core Metadata Element Set defines a set of 15 essential metadata components:

- Title: The title of the item or resource.
- Creator : The creator of the item, in Library of Congress authority.
- Subject: Subjects covered by the item. Use of controlled vocabularies such as Library of Congress Subject Heading.
- Description: A short description of the item.
- Publisher: Enter the name of the repository where the original materials are held.
- Identifier : Filename, image number, PURL, or other URI (Uniform Resource Identifier) for the image.
- Date : The date the image or transcription was created. Note the date of the creation of the material goes in “Coverage”
- Coverage (Temporal) : The date of the creation of the material in the form YYYY-MM-DD. So for a letter written on November 20, 1864, enter the date as 1864-11-20.
- Coverage (Spatial) : The name of the Georgia county and/or city in which the item originated. If none is indicated, “Georgia” will be sufficient. Use Kenneth K. Krakow, *Georgia Place Names: Their History and Origins* 2nd ed. (Macon: Winship Press, 1994), and the *Thesaurus of Geographic Names* where possible for a controlled list. If from another state, list the city, county, and state as available.
- Format : The format of the image or digital file, expressed in the MIME format. For example: image/tiff, image/jpeg, text/html, etc.
- Source : A reference to a resource from which the present resource is derived in whole or in part. For archival collections, this should be the name of the collection from which the item originates. The following additional Dublin Core elements are optional, but their use is encouraged:

- Contributor : An entity responsible for making contributions to the content of the resource
- Relation : A reference to a related resource
- Language : A language of the intellectual content of the resource Values should be taken from the ISO 639-2 standard, and expressed as three letter codes (i.e., eng., free)
- Type : The nature of genre of the content of the resource. Use standardized vocabularies such as the Library of Congress Thesaurus for Graphic Materials II : Genre and Physical Characteristic Terms (TGM II) or the Art and Architecture thesaurus.
- Rights : Information about rights held in and over the resource, such as a statement of copyright or other property rights. (Lakshmi, S. 2010,pp.11-12)

I) Advanced Bar Code Technology

Introduction to Bar Code Technology

We live in an information age characterized by rapid change. Today's world moves faster than earlier eras, and the pace continues to speed up. Continuous developments with computer technology in manufacturing, distribution, communications, transportation, healthcare and other sectors have played, and continue to play, a large part in accelerating change.

Barcode

From an original idea patented in the USA in 1952 by (Woodland and Silver], barcode really became commercialized in the late 1960s in the USA, driven by two key industries, the Grocery / Food / Supermarket sector and the US railways. Work in the grocery sector eventually resulted in the UPC code which was first used in 1974. (A packet of Wrigleys chewing gum was the very first item to be read).Since the first use in 1974, the UPC code became extended to include 2 extra digits to become EAN, which is now probably the most widely used code in the world. Barcode really started to be taken up by industry in 1981 when the US Department of Defense adopted Code 39 for the coding of military equipment,

As time went on, further coding systems were developed and today there are a wide range of different symbologies, available to users.

Barcode is the most widely used identification technology in the world and nowadays there can't be many people on the planet who don't know what a barcode is. It is a very powerful technology, very cheap to produce with a wide range of scanning and printing equipment available in the market at competitive prices. Blackroc provides a wide range of barcode scanning equipment which you can find in the products section of this website.

There are those who consider that barcode has had its day and that RFID tags will soon replace it. This is a very limited view. It is unlikely that barcode will be replaced by RFID certainly for identification at item level, and in the future it is likely that the two technologies will be used side by side, utilizing the different strengths of each to suit particular requirements within the same application.

How does it work?

A traditional (linear) barcode label consists of a series of black and white bars of different widths arranged according to a specific set of rules for that particular barcode type or "symbology". A light source from a barcode reader or "scanner" (CCD or laser), illuminates the label, and receiving optics in the scanner head record the returned light signal from the white spaces which reflect the light and the black bars which absorb the light. These reflected peaks and troughs are converted into electronic signals which are then decoded according to the rules for that particular symbology, into ASCII characters.

Many different linear symbologies are available nowadays, including the following:

UPC-Based Symbologies

- UPC-A: Used with consumer products in U.S., 12 characters
- UPC-E: Short version of UPC symbol, 6 characters
- EAN-13: Used with consumer products internationally, 13 characters
- EAN-8: Short version of EAN-13, 8 characters
- JAN Codes: Same as EAN-13, used in Japan
- Bookland : Used to mark books with ISBN number
- UPC-Based Extensions
- 2-Digit Ext.: Used to indicate magazines and newspaper issue numbers

- 5 Digit Ext.: Used to mark suggested retail price of books
- 2 of 5 symbologies:
 - Standard 2 of 5: Used in airline ticket marking, photofinishing
 - Industrial 2 of 5: Same as Standard 2 of 5
 - Interleaved, 2 of 5: Used in warehouse, industrial applications
- Pulse Width Modulated Symbologies:
 - Plessey Code: Old symbology, used for shelf marking in retail environments
 - MSI : Variation of Plessey code, with similar applications
 - Modified Plessey Code: Same as MSI
- Anker Code: T J sedin European POS systems before EAN was implemented
- Code 11 (USD-S): Used to identify telecommunications equipment
- Postnet : Printed by U.S. Post Office on envelopes
- Codabar (aka Anres Coite/USD-4/NW'7/2 of 7 Code):

Advanced Barcode Technology

Advanced Barcode Technology® (ABT) offers innovative, cost-effective automatic identification solutions that business productivity, management control, and the availability of mission-critical information in today's complex, highly competitive business environment.

ABT delivers complete, end to end solutions incorporating their ABT experience in the manufacturing of Barcode scanning equipment. Combined with leading edge software design backed by superior service and consultation expertise.

Barcodes - Smart and Dumb

Simply, SMART barcodes have the title and local call number printed on the individual barcode, DUMB barcodes do not.

More specifically, SMART barcodes are usually used in the first stages of automation. They are the product of sending out your shelf list for a Retrospective Conversion or getting your data back in MAC format from any kind of conversion. Usually, barcodes, data disks (which have the matching barcode numbers as part of the new MARC records) and the shelf list are returned at the same time. The idea is to

get the barcodes on your books before you start using a computer and barcode scanner at the checkout desk.

On the other hand, DUMB barcodes are usually supplied for ongoing, in-house library use, after the Retrospective Conversion, as things need to be cataloged in the automation system. A 10,000 volume collection may get 10,000 smart barcodes for immediate use and another 3,000 DLMB barcodes for ongoing use for future items that will be added to the collection.

Perhaps the most important thing about SMART barcodes is that before SMART barcodes are printed into sheets or rolls of barcodes with the titles on them, they are sorted (by computer) in your library's local call number order. That means ideally, the barcodes on the peel-off sheets or rolls are in better order than the books on the shelves; or, to put it another way, it means that relatively untrained people can go down your shelves, putting the right barcodes on the right books. In Texas, they have Barcode parties with the PTO. Elsewhere, there are Trustee volunteers, Honor Student Projects, faculty after school task forces (with plenty of refreshments), and Adopt-a-Shelf schemes. Not to mention the solo librarian just doing it, her- or himself.

Handheld Scanners

These devices are available in two principal technology formats, laser scanners and CCD scanners.

Laser scanners work by moving a tiny beam of laser light (using an oscillating mirror) in a straight line across a barcode and reading the returned light signals. Considered generally as the premier scanning technology, laser light can be emitted to a considerable distance, and so it is the technology of choice for long range applications, and scanners are available which can read up to 10 meters or so. Because the beam of laser light is linear, for use with 2D barcodes a laser scanning beam has to be “rastered” that is, moved up and down the label in order to get 2D coverage.

CCD scanners work by illuminating the barcode label with a thin line of light usually from an array of LEDs in the head of the scanner, and then taking an image of the illuminated line, on a pixel by pixel basis and then decoding the light and dark spaces. CCDs are either linear, that is they read a thin line of light, for use with linear barcodes, or area, that is they can take an image of the whole area (e.g. for 2D barcodes), a bit like using a CCD camera. Because the latter works like a CCD camera it can also be used for capturing non-barcode images such as signatures and

people's faces for example, (often also referred to as imagers). In general terms CCD scanners tend to be cheaper than laser scanners.

What do we Need to print Barcodes ?

Dot matrix, laser, and ink jet printers can be used to print barcode labels, but they all have their drawbacks. Thermal label printers are specifically designed for the task and so give the best results. They can print at high speeds and can be used to print single labels at a time, or whole rolls at once.

Thermal Printing Explained

Thermal printing involves heat transfer from a thermal print head to a heat sensitive paper or ribbon. The print head consists of a long, linear array of tiny resistive heating elements that are arranged perpendicular to the flow of the paper. Each element heats the area directly below it on the paper and the image is produced by the rows of dots that are printed onto the paper as it passes beneath the print head. There are two basic thermal printing methods:

Direct Thermal Printing (DT) :

With this method, the print head is in direct contact with the chemically treated paper and no ribbon is used. As a result, the running costs are lower, however, this method will also wear down the print head faster than with thermal transfer as paper is coarse and will wear the print head down over time. In addition to this the edge of each label strikes the print head as it passes causing further wear. So although no ribbon is needed, the print head will wear out faster. Print heads are considered to be consumables and must be included in the overall cost of operation.

This method should be used where the lifecycle of the label is very short, and cannot come into contact with heat or ultra violet light. Thermal paper will mark if scratched and will eventually turn black if left for long periods of time.

(Aswal,R.S.2006,pp.199-205)

J) RFID Technology

What is RFID (Radio Frequency Identification)?

In the 21st Century, libraries will operate with such simplicity that users will be able to check materials in and out themselves and find what they want almost

instantly—leaving library staff with more time to give users the personal attention so many of them need and to keep up with the avalanche of new information and materials being created every day.

RFID, or Radio Frequency Identification, is one of the most exciting new library technologies in years. It promises to revolutionize how librarians do their work and how customers receive library services. In general terms, Radio Frequency Identification (RFID) is a means of identifying a person or an object by using a radio frequency transmission. These wireless automatic identification data capture systems allow for non-contact reading or writing of data, and they are highly effective in manufacturing and other hostile environments where bar code labels cannot survive.

RFID has been in existence for over 20 years, and it has been extensively used in applications such as tool collection, access control and/or ticketing. In recent years, the technology has received increased attention due to a confluence of events including technology advancement, heightened security concerns, supply chain automation, and a continuing emphasis on cost control within industrial systems.

RFID is a combination of radio frequency-based technology and microchip technology. 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. [The devices used for circulation and inventorying are usually called “readers” while the ones used at building exits are usually called “sensors”.

Radio frequency identification (RFID) is one of the most rapidly growing segments of today's information technology (IT) and automating identification and data capture industries. Many large libraries around the world have implemented RFID to speed material check-in, checkout, shelf inventory, and security application. Low-cost, flexible smart labels are inserted in books and can be made invisible to patrons. Counter personnel can check dozens of books in or out in mere seconds without manually handling and orienting each item. The tags also can be used for theft detection, much like anti-shoplifting technology currently used by retailers. Librarians using portable computers with RFID readers can take inventory and find misfiled

materials simply by walking down an aisle of bookshelves. The reader can automatically detect missing materials and alert the operator.

RFID uses low-power radio signals to exchange data wirelessly between chips and reader / encoders. No direct line of sight is needed between the tag and read/write device, eliminating many of the labor and item-orientation requirements associated with other forms of automated data collection. RFID readers can simultaneously recognize and process hundreds of tags within their read fields, while barcodes have to be scanned one by one.

How is RFID Different than Bar Code?

It is important to understand the significant differences between RFID and bar code to appreciate the benefits RFID can provide. Bar code and RFID are both identification technologies that hold data that is accessed by some type of reader. In actuality, they complement each other very well and can be used effectively side by side in many applications. Bar code is an optical technology and RDID is a radio technology. The ways these technologies exchange data account for most of the differences between RFID and bar code and help determine where each identification technology is best put to use.

RFID readers can automatically recognize and differentiate all the RF tags in their reading fields. This simultaneous processing capability provides additional flexibility for material handling, packaging and sortation operations because there is no need to maintain spacing between objects to ensure they will be read. The ability to read dozens or even hundreds of tags per second makes RFID ideal for high-speed sortation, receiving, cross docking and other applications.

Component of RFID System

A comprehensive RFID system has three components:

1. RFID tags
2. Reader or sensors
3. Antenna
4. Server / Docking Station

RFID Tags

It is composed of a microchip attached to an antenna that is packaged in a way that it can be applied to an object. The tag picks up signals from and sends signals to a

reader. Tags can be smaller than a grain of rice or as large as a brick. RFID tags are either passive (no battery) or active (self-powered by a battery) or semi-passive. Data transmission speed and range depend on the radio frequency, antenna size, power output, and interference. Tag can be read-only, read-write and WORM.

In “passive” tags are the most common tags used for libraries. In this system the power to read the tags comes from the reader or sensor, rather than from a battery within the tag; In “active” tags, which have their own power supply, are substantially larger and more expensive than the tags used in library RFID applications. It is these tags that can be read at distances of up to ten feet.

Features

- The RFID tag has 3 sections: a lockable section for the item identification, a re-writable one for library specific use, and a security function for the item antitheft.
- The RFID tag don't need to be visible to be read books and other media can be quickly identified in any orientation.
- The RFID chip integrates a “multi-read” function, allowing several items to be processed simultaneously.
- The RFID tags are compatible with traditional library security systems.
- The RFID tags are self-adhesive and can be affixed directly onto items. They come in different forms: rectangular for books, round for CDs, long for audiocassettes. They can be easily attached to paper labels.

Technical Specifications:

Here are the common types of passive RFID tags and their performance characteristics:

- Low Frequency RFID systems operate at about 125 kHz with a typical maximum read of up to 20 inches (508 mm).
- High Frequency FRID systems operate at 13.56 MHz with a typical maximum read range of up to 3 feet (1 meter).
- Ultra-High Frequency RFID systems operate at multiple frequencies, including 868 MHz (in Europe), a band centered at 915 MHz, and 2.45 GHz (microwave). Read range is typically 3 to 10 feet (1 to 3 meters), but systems operating in the 915 MHz band may achieve read ranges of 20 feet (6 meters) or more.

- Delivery packaging in rolls of 2000 self-adhesive labels
 - Have longer life spans than barcodes.
 - Multi-read abilities allow batch processing.
 - Utilizes low cost 13.56 MHz frequency
 - Incorporates an anti-theft capability

RFID Reader

A typical system includes several different kinds of readers, also known as sensors when installed at library exits. These are radio frequency devices designed to detect and read tags to obtain the information stored thereon. The reader powers an antenna to generate an RF field. When a tag passes through the field, the information stored on the chip in the tag is decoded by the reader and sent to the server which, in turn, communicates with the automated library system when the RFID system is interfaced with it. While there is software in each reader to facilitate communication with the server and / or with library staff, most of the software supplied by the RFID system vendor is on the server when one is included in the system. When there is no server, most of the software is on the readers, although some may be on a docking station.

RFID Antenna

RFID Antenna connected to the reader, which has a size and a structure that is determined by the distance for communicating and performing at a given stage.

The tag antenna is the conductive element that enables the tag to send and receive data 'Passive' low - (135 kHz) and high-frequency (13.56 MHz) tags usually have a coiled antenna that couples with coiled antenna of the reader to form a magnetic field. UHF tag antennas can be a variety of shapes. Readers also have antennas which are used to emit radio waves. The RF energy from the reader antenna is 'harvested' by the antenna and used to power up the microchip, which then changes the electrical load on the antenna to reflect back its own signals.

Server / Docking Station

It is the communications gateway among the various components. It receive the information from one or more of the readers and exchanges information with the

circulation database. The server typically includes a transaction database so that reports can be produced.

The server is the heart of some comprehensive RFID systems. It is the communications gateway among the various components. It receives the information from one or more of the readers and exchange information with the circulation database. Its software includes the APIs (Applications Programming Interface) necessary to interface it with the automated library system. The server typically includes a transaction database so that reports can be produced. A server costs as much as \$15,000, more than two-thirds of which is the software.

Staff Check-Out Station

The self checkout station allows patrons to borrow books without assistance from the library staff.

- Self Service
- Convenience
- Privacy
- Eliminates bottlenecks
- Very easy to learn
- No orientation issues
- Productivity factors
- Frees staff
- Online updating of central database
- Theft system disarmed
- Option of writing other information to tag
- Transaction (s) could be linked to security camera.
- Receipt issued.

Self-Return Book Drop with Automatic Check in Feature Station.

The self-return book drop, in turn, allows loans to be cancelled instantly as patrons deposit books through an external book return chute. This interface also updates the database and alerts the library when items are returned.

- Very Fast
- Multiple items

- Multiple Media
- Any orientation
- Situated within library or at a remote location
- External access
- Internal access
- Book's returned are immediately updated on the central database.

Shelving Station

The shelving station tells the staff where to reshelv the book and also activates the security bit. The Fastrac Modular Sorting System is a revolutionary system that takes the materials from the return chute, checks them in, sorts them and distributes them to multiple bins, areas, or even floors for re-shelving. With continuous book handling, using a system that supports hundreds of bins, Fastrac can process over 2000 items per hour. It can sort items by status or bookshelf location and redirect accordingly. Rapid processing and automated efficiencies means "shorter to shelf periods and less work for library staff.

Library Security Gates

The library security system benefits from the latest design innovations to combine both item identification and security into a single device: the RFID Tag. The VTI,S Security Gates feature the most modern detection algorithm that constantly detects non de-activated antitheft function.

During check-out and check-in operations, the antitheft function is automatically de-activated or activated at the same time. Items that have not been checked out properly instantaneously trigger the gate's alarm as they pass through the detection field.

Features

- Each pedestal is standalone and plug and play to the main power, and does not require additional equipment.
- Featuring an advance Digital Signal processing technology, prove maximum detection speed and field, regardless of the RFID tag orientation.
- Security Gate is made of 2 pedestals. Additional pedestals can be added in a row for increased detection surface.

- Security Gate need not to be linked to the library database, and therefore they can still operate when the Library network is down or overloaded.
- Security system uses a single RFID tag for both identification and security; as well as a single piece of hardware equipment, to offer an efficient, reliable and cost-effective solution.

6 Inventory Control System

7 Benefits of RFID in Automated Library

The RFID Solution provides numerous advantages over traditional barcode systems. Here are just a few of the benefits:

- Rapid charging discharging :
- RFID is a comprehensive system that combines RFID security and the tracking of materials throughout the library
- Simplified patron self-charging/discharging
- High reliability
- High-speed inventorying :
- Long tag Life :

Disadvantages of RFID Systems

High cost :

Vulnerability to compromise :

Removal of exposed tags :

Exit sensor problems

Perceived Invasion of Patron Privacy

The vast majority of the tags installed in library materials contain only the item ID, usually the same number that previously has been stored on a barcode.

How it Reduces Staff Workload :

- Processes more items in a shorter period of time with less handling
- Accurate multi-item self-check circulation in patron's preferred language
- Rapid real-time or batch inventories that leverage ILS reporting
- Wireless weeding
- Book returns that do the work for you with automatic check-in
- Automatic sorting that distributes material to multiple bins, areas, or even floors for reshelving and “shorter to she shelf” periods.

- Offline transactions are automatically updated with no staff intervention

(Aswal,R.S.2006,pp.206-219)

3.11 LIBRARY MANAGEMENT SOFTWARE PAKAGES:

3.11.1 GENERAL PURPOSE SOFTWARE :

Under general purpose software are can mention word processors, ex- WordStar, Database Management System (Ex:- DBASE IV, FOXBASE, FOXPRO etc.) localised cataloguing where as mainframe computer systems provide for either centralised shared cataloguing or for distributed cataloguing. Available software packages on online cataloguing have all or some of these features.

1. System support for creation and maintenance of an online and interactive bibliographic database of individual records for each item in the library collection.
2. Creation of index file of terms extracted from the title, author, subject and other fields.
3. Vocabulary Control
4. Boolean searching facility of the database by subject, author, title, call no., ISBN, ISSN and 'data of the data entry.
5. Shelf list production
6. Catalogue cards and label printing
7. Book catalogue printing arranged alphabetically by authors under subject headings.
8. Production of bibliographies.
9. Printing of reports of title received with in a given period of time.
10. Date update and conservation in standard format Ex:- MARC ISO 2TO9, etc.

(Singh, C.P. 2008,p.119)

Some micro computer based systems for cataloguing are COMPULOG, GENCAT, INMAGIC, UTLAS/series, LICAT etc. Mainframe computer based systems are ADLIB, ALOOF, AGILE-11, BASIS (TECHLIB), CARLYLE (TOMUS), cataloguing sub system (OCLC, Inc., USA). DOBIS/LIB, etc. (Vaidya Sagar,P 2005,p.111)

3.11.2 SOFTWARE PACKAGES FOR CATALOGUING :

Catalogue is an important operation which is practiced with considerable variation in libraries all over the world. It is important because it is the principle means to assess the library materials and assist library users to select books of their choice. The cataloguing process involves indexing, classification, description of documents, vocabulary control and arrangement and presentation of information in regarding document a helpful way. These cataloguing standards such as AACR-2 and ISBD formed on the basis of Paris principle of 1961 on cataloguing are widely followed to catalogue library documents. Computer based cataloguing system can be owned and in-house or it could be shared with other library through system or it could be shared with other library through co-operative arrangement or through a commercial services. Micro computer based system are generally meant for

Commercial :

Several commercial firms have developed the library softwares; but they are expensive. In India, many software developed by commercial agencies are in use. However, LIBSYS, INFOTEX, WILYSIS, TULIP, etc. a few popular software available in India. Recently, CDS/ISIS based library software, namely SANJAY and MAITREYEE were developed by DESIDOC with the support from the department of science and Technology (DST).

(Aswal,R.S.2006,pp.139-141)

3.11.3 SOFTWARE FOR CIRCULATION CONTROL

Circulation control system of a library is to provide information about the document borrowed, the names and addresses of borrower, the loan scheme under which each document has been lent out, overdue documents, charges to be levied and reservation to be made. This system can be allied to other housekeeping activities of the library such as, acquisition of books and serials control to provide a complete inventory control. While selecting the appropriate computer based system a librarian must consider the total number of borrowers, the number of loan transactions, the total stock to be entered into the system and the proportion of stock which is loaned. The number of computerized systems available in the market today makes it difficult to objectively assess the available alternatives and select one for use include capabilities to perform all or some of the following functions:

- Maintaining records of library users eligible to borrow books and identifying them through Id No.
- Checking out records of library documents.
- Checking in of returned materials.
- Preparation of overdue and recall notices;
- Notification of the delinquent borrowers;
- Posting of files and production of file notices;
- Making reservations and producing reservation notices
- Production of circulation and statistical reports.
- Production of mailing list labels.

For carrying out these functions software packages are designed to capture and manipulate information of documents, uses and transaction. Some of the micro computer based systems available commercially are bookworm, CIRCA II, CIRCULATION MANAGER, LIBRARY CIRCULATION SYSTEM, OCELOT CIRCULATION, CLASS, SYDNEY'S MLS- CIRCULATION etc. Mainframe based systems are BASIS (TECHLIB), ADLIB, ALIS, CADMUS, DOBIS/LIBS, BMILS/3000, INMAGIC, etc. (Kochar & Sudarshan 2007, pp.133-142)

3.11.4 Software for Information Retrieval :

Most of the packages are bound to specific makes of hardware and therefore, they lack portability. Also a majority of them are developed for small scale or specialized applications; only a very limited ones are generated portable packages to help libraries to design and develop information retrieval systems specific to their requirements. A generalized portable package for information retrieval should possess the following characteristics as defined by the UNESCO.

- Capability to handle large database and facility for online input and data and batch as well as online updating of data bases.
- Provision to index users specified fields/ sub fields.
- Flexibility to allow users to write their own specification for local use.
- Inclusion of retrieval function, such as. Boolean query formulation, search refinement field or sub fields limits on search scope, display of posting frequency, truncation of word termination. stored search or stored questions, stop word stored lists, synonyms recognition, thesaurus support, help facility

to user, sorting, editing and formatting of search results and security controls at database as well as record level user friendliness without seriously affecting its efficiency;

- Ability to provide multiple access points to conduct many searches simultaneously.
- a built in import and export facility of data in machine readable files in standard format such as , UNIMARC, ISO-2700.and CCF.
- Ability to include interface with devices of all composition and computer output microfilm(COM)
- Up and down loading capabilities of databases between micro computers and mainframes.
- Ability to monitor its own operation and provide various types of statistical and management reports;
- Capability to establish connection with external online databases and ability to download data for its own databases,
- Ability to create and store profile of individual user and provide SDI output.

The package is also likely to be distributed through UNESCO. Some of the popular packages developed for mainframe and minicomputer are MISTRAL, ASSASIN, UNIDAS, STAIRS, BASIS, TEXTO, QUESTEL, etc. Micro computer based software packages are INMAGIC, STRIX, SCIMATE, note book-II FINDER, etc. There are text- oriented DBMS packages which provide frameworks within which the user may develop information storage and retrieval system. These packages are usually aimed at the business users and the librarians using them have to accept their limitations though in most cases they have served well. One of the severe limitations of these packages is, their inability to handle variable length records. In some cases response time has been found to be unsatisfactory. A key factor in the selection of DBMS is “size” retention to determine how much space is allowed for a record and how large an individual field can be DBMS have been satisfactorily by some librarians on mini computers for information storage and retrieval.

(Vaidya Sagar,P 2005, p.44)

3.11.5 Online Search Assistance Software

Time shared data communication networks operated by means of voice grade telephone lines have created a new dimension on the provision of online information service. Through leased lines of these networks, which span now in most countries of the world. it is possible to buy access to databases of online retailers of bibliographic services. These retailers provide access to wide range of data bases covering varieties of subjects. Online searching is a complex task requiring considerable knowledge of subject, databases available, search formulation techniques and command language for databases to search. Besides, the searcher must be an accurate and fast typist to reduce connect time as far as possible. Singh, C.P. (2008,p.18) online search assistance of the packages are available to help searcher in two ways. By providing training to the end user and by automating the online search process. Vaidya Sagar,P (2005,p.40) The online search training software packages include computer assisted learning(CAL) techniques and system stimulation modules. One such package is the Online Search Tutor (OST) developed under funding from the British library research and development.

(Kochar & Sudarshan 2007, pp.110-118)

3.11.6 Software For CAS

There approaches of CAS are production of current awareness bulletin running of selective dissemination of information (SDI) services and bring out of evaluative reports. The approach adopted by a has depends largely on the needs of the users and availability of the time and money. The available software package are concerned with first two approaches only. A current awareness bulletin is commonly a categorized list of bibliographical references of currently entered items in a database of a library. The bulletin may include brief abstracts along with citation details of included items. Most of the IR packages on mainframe computers are provided with the module to produce current awareness bulletin and SID output , ex PROFILE reduce of BASIS software is used for SID. There modules catalogues search statements, display requests cornputational expressions and other repetitive commends for execution at the later dates. An SDI output consists of reference-s obtained by matching users and document profiles.

(Singh, C.P. 2008,p.11)

3.11.7 Software for Management Work

Several types of software packages are available to help librarian for creation of their own text or reports periodical management quick communication of mail or data and development network to Sheri and use computerized databases. The packages through which these works are carried out all in the category of word processing software sparsed sheet software for local area networks .These types of software packages are gradually becoming popular and forming part of automated library management systems. Spreadsheet software package s permiits planning management and control of finance which a library is often required to do. They have also been used to mood on line search cost and for inventory control and collection management of a library. Several spread sheet packages are available with verging capabilities and cost. Some of the micro computer based packages are PERFECT CELC, KAYPRO 10, SUPERCALC, LOTUS 1-2-3, MULTIPLAN, etc. To sachet a spreadsheet a librarian needs to be assured that it will hold. The full disminision of budget and formulated needed for computation.

3.12 SOFTWARE PACKAGES DEVELOPED IN INDIA :

Some libraries and information centres have developed software packages according to their requirements. These packages are used for

Acquisition:

Developed by Bharat Heavy Electrical Ltd. (BHEL), Defence scientific Information centre(DESIDOC), Information Planning and analysis (IPAG) metallurgical and engineering consultants (MECON) national information centre for food science (NIFOS)" National Institute for Training in Educational Industrial Engineering(NITIE), Physical Research laboratory (PRL), India Limited (SAIC), (R&D). (Kochar & Sudarshan 2007, pp.134-135)

Cataloguing :

Developed by DESIDOC, IPAG, MECON, National Aeronautics laboratory (NAL), NITIE, PRL, SAIL (R&D).

Circulation:

Developed by DESIDOC, IPAG, MECON, NITIE, PRL, SAIL,(R&D)

Online services :

Developed by DESIDOC, IPAG, MECON, NITIE, PRL, SAIL(R&D), Tamil Nadu University, Vikram Sarabhi space Centre(VSSC).

Report Generation:

Developed by Bureau of Indian Standard (BIS), DESIDOC, IDAG, Indian National Scientific and documentation centre(INSDOC) MECON, NICFOS, National information centre for leather and allied industries(NICLAT), PRL.

SDI & Retrospective Searches

Developed by. BIS, DESIDOC, IDAG, INSDOC, MECON, NICFOS, NICLAT, PRL.

Developed by Bhabha atomic research centre(BARC), BHEL, DESIOC, Indian Agricultural statistics research institute(IASRJ), Hindustan Aeronautics limited(HAL), INSDOC, MECON, National information centre for drugs and pharmaceuticals (NICDAP), National information centre for machine tools (NICMAT), national institute of science technology and development studies(NISTADS), Publication and information directorate(PID) SAIL(R&D),TamilNadu University, Tata Institute of fundamental research (TIFR), VSSC.

(Singh, C.P. 2008,p.28)

Serial Control:

Developed by DESIDOC.

The main reason for the high cost of software is that software projects are often very large, involving many people, and span over many years. The development of these systems is often done in an adhoc manner, resulting in frequent schedule slippage and cost overruns in software projects. Some projects are simply abandoned. Hence, there is an urgent need for proper software development methodologies and project management techniques. (Kochar & Sudarshan 2007, pp.110-118)

3.12 Conclusion

Application of computer in libraries is becoming very common these days. This has made enormous changes in the operations of the libraries in our country. The most popular library automation software package available in our country .

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