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Library Automation : What is Expected of ?

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ABSTRACT

Although a number of developments are taking place in the field of information technology and the hardware is readily available at affordable prices, libraries in India have not yet gone for automation in a big way. It is partly due to lack of trained manpower and non-availability of suitable software. This paper attempts to discuss the areas of computerisation in libraries, the objectives and functions of computerised acquisition, serials control, circulation, and cataloguing.

1. INTRODUCTION

It can be rightly said that the establishment of the Electronic Commission in the early 1970s was a major step towards the development of information technology (IT) in India. This has led to the setting up of the National Informatics Centre, the Computer Maintenance Corporation of India and the National Centre for Software Technology, etc, which became catalysts in the rapid growth of developments and applications in this field. Since then computer applications in different fields became not only feasible, but popular and in some cases inevitable; for example, computerised reservation systems in transport sector, computer-aided design, computer-aided teaching (especially for children), business transactions, communication (e-mail), etc., have been well accepted by the user population in their respective fields.

In the first half of the fiscal year 1994-95, more than 1,00,000 systems (including servers, work stations, notebooks, etc.) were sold in Indian market (1). It is estimated that more than 220,000 systems are likely to be sold in the complete financial year. As far as software is concerned, during the first half of the year, the turnover was nearly 1,075 crore, including the export component. Further, these systems were being bought by a large number of individuals. As such, the corporate (or the government) segment is not specifically responsible for the surge in IT buying. Both the first time users and the corporate sector are buying equally. This is due to the realisation of the importance of IT and high computer literacy among the literate Indians. These figures and facts explain the IT environment in India.

Like other professions, even among the librarians and information scientists, many

are computer literate and have access to adequate computing facilities. Still, hardly any library has gone for a total computerisation. This is partly because of the following factors :

(a) No proper importance has been given to library automation. If one carefully looks at the situation, library automation is given less importance as compared to the library networking. It is important to realise that the success of a network depends only on the extent of the automation programme implemented in each of the participating libraries.

(b) Most of the librarians still consider library automation as luxury rather than a necessity for generating resources like an industry.

(c) Library schools lack adequate facilities to train the required skilled manpower in computer applications.

Of course, even after having several years of experience and involvement in the field, quite often, we ask ourselves why should we go for automation when there is abundant manpower resources? It is important to note in this context that library automation has now become inevitable, because of several factors such as :

(a) Emergence of activities which cannot be done in the manual system, e.g., remote real-time access to large databases.

(b) Availability of a number of journals in machine-readable form. Further, many databases are available (only) in compact discs. Such machine-readable databases can be used for providing simultaneous access to a large number of local or remotely located users.

(c) Fall in the hardware costs; availability of more public domain software packages for different applications.

(d) Advances in the IT industry.

2. LIBRARY AUTOMATION

Computerisation of all the library house-keeping operations is known as library automation. Most commonly known house-keeping operations are acquisition, serials management, cataloguing and circulation. Depending on the type of library, all or some of these functions may be computerised according to their priority. Circulation control may be given first priority in a public library while serials control may be given a top priority in a special library. Similarly, acquisition may be computerised first in a university library. However, cataloguing is important for any library and its computerisation must be one of the ultimate aims of the automation programme (2,3).

Chowdhury and Chowdhury (4) have given a list of software of Indian origin for handling library related activities (Table 1) and also a brief review of some common facilities available in chosen packages.

2.1 Automated Acquisition Control Systems (AACS)

The primary objectives of an AACS are likely to be towards cost containment, speeding up of the receipt of materials, improving fund control and developing single function systems into integrated systems. The AACS is expected to perform certain managerial functions in addition to some clerical functions like pre-order searching, creating purchase orders, etc.

Systems are usually designed to handle regular as well as the standing and blanket orders, exchanges, regular receipts and non-receipts, out-of-print documents with wrong billing, unwanted documents with right billing, pre-payment, on approval, and so on. The system should be able to handle re-order to another vendor and should provide retention of records under

Table 1. Software of Indian origin for the automation of library activities.

Software	*Source*
Archives (1,2,3)	Microfax Electronic Systems, Bombay
ACQUARS, ASCAT, ASCIR, ASIRE, SEARS CATMAN	Ober Information Systems, Calcutta
Golden LIBRA	INSDOC, New Delhi & Golden Age Software Technologies, Bombay
LIBRARIAN (2.1 and 3.1)	Soft-Aid, Pune
Library Management	Raychand Sysmatics, Bangalore
Library Manager	System Data Control Pvt. Ltd., Bombay
LIBSOFT	Et & T Corpn, New Delhi
LIBSYS, MICRO-LIBSYS LISTPULS	LibSys Corp., New Delhi; Computer Systems, Bangalore
LoanSoft	Computek Computer System, Hyderabad
MAITRAYEE	CMC, Calcutta, developed for the CALIBNET Project)
MECSYS	MECON, Ranchi
NILIS	Asmita Consultants, Bombay
NIRMALS	Nirmal Institute of Computer Expertise, Tiruchirapalli
SALIM	Uptron India Ltd., New Delhi
SANJAY	NISSAT, New Delhi, developed by DESIDOC, Delhi under a NISSAT Project.
Slim 1.1	Algorithms, Bombay
TULIPS	Tata Unisys Ltd.., Bombay
WILISYS	Wipro India, Bangalore

conditions such as items out of print, items never published, orders cancelled, etc. Thus, functions of AACS include pre-order searching, ordering, claiming, cancellation of orders, receipt processing, payment, routing, fund accounting, vendor accounting, currency control, statistics and report compilation, etc. The system should be able to handle orders to variety of documents, viz. monographs, monograph series, law reports and statutes, musical scores, etc., irrespective of their physical formats like print, microfilm, microfiche, microcard, film, videotape, audio cassette, compact disc, audio disc, magnetic tape, software, etc.

The acquisition record may be accessible online by different data elements such as purchase order number, author or corporate heading, title or part of it, subtitle, series title, conference title, LC card number, ISSN, ISBN, indentor, etc.

2.11 Acquisition File

Data stored in the 'acquisition files' (often known as order files) may include complete bibliographic information, acquisition type (order, gift, exchange, etc.), information about library, branch, copy, fund, invoice, vendor, accounting, etc., indentor's name, location (i.e., destination), instructions to the vendor and internal processing instructions (free text—non-printing on order form).

2.12 Vendor File

The vendor file consists of vendor's name and address, vendor claim period indicator, vendor performance statistics, the

number of times 'claimed' and 'cancelled', discount percentages, etc. The system should further keep track of the time from placing order to document check-in, so that performance can be monitored.

2.13 Fund File

The fund file consists of amount budgeted, amount encumbered, amount spent, uncommitted balance, starting balance amount (carried forward from previous year), encumbrances carried forward from previous year, supplementary budget appropriations, etc.

2.14 System Output

The output of the system may include purchase order on different formats (e.g. 8.5" x 11" and 3" x 5" multiple part forms), updated report on availability of funds, online and off-line communication support with suppliers, and selected bibliographical records from other cataloguing support systems. The output may be in computer output on microfiche and it may include all bibliographical and order information. The system must provide printed output of all purchase orders or all orders for a particular vendor, payment type, fund, order type, order status, and location. As a function related to listing, the system must have the ability to perform Boolean sorts using AND, OR, and NOT on any fixed field and to print subsets of holdings on this basis. Further, the system must be able to produce a variety of reports.

2.2 Automated Serials Control System (ASCS)

General objectives of an ASCS are to handle serials and to maintain a holdings list. To achieve these objectives, the system must perform the following functions :

(a) Subscribing to new serials : Sending subscription letters; keying-in serial data and maintaining subscription file

(b) Renewal/cancellation of presently subscribed serials

(c) Accessioning of individual issues, as and when the issues are received

(d) Sending reminders, if necessary

(e) Claiming the issue (request for replacement of defective copy, follow up of missing copy, etc.)

(f) Check-in, routing

(g) Preparation of various lists : List of periodicals to be renewed; list of periodicals received/cancelled during a specified period

(h) List of holdings with their status : In shelf, in binding, in circulation, etc.; union listing (the lists can be by subject, by country of origin, by title, etc.)

(i) Keeping track of amount spent on serials subscription, binding, etc.

(j) Estimation of budget

(k) Binding control

The system must handle all types of serials like, periodicals, continuations, law reports, news papers, annals, memoirs, indexes, supplements, loose leaf materials, etc. The system should also store all data pertaining to serials, holdings, subscription, vendor, current issue status, etc. The system should provide the ability to :

- Search serials records by title (or part of it), call number, ISSN, publisher, vendor, budget number, subscription number, location, corporate author, system assigned number, keyword, etc.
- Show gaps in holdings
- Distinguish multiple copies from the same or different sources
- Have special instructions such as retention, special routing, holding, special check-in procedures, etc.

- Handle all types of frequencies and it must allow for easy adjustment of frequency changes
- Handle variable length record.

Here also, the system must have the ability to perform Boolean sorts on any fixed fields and to print subsets of holdings on this basis and further, it must produce a variety of reports. It must have the advanced features to handle complicated procedures of binding control. The data pertaining to the vendor file and fund file may be similar to that of AACS.

2.3 Automated Circulation Control System (ACCS)

Circulation as a library function is a very specific and well defined operation. It is concerned with the clerical function of keeping track of documents taken out or returned by the user. The scope of an ACCS can be either traditional or broad depending upon the design objectives established by the library. Thus, one of the basic considerations in the design and selection of circulation system is defining the role and objectives of a circulation system in the library. A typical ACCS performs some or all of the following functions :

(a) Provision of information for the location of items under circulation—either all items in the library or only those items on loan or elsewhere, i.e., at the bindery, on reserve, being recatalogued, etc.

(b) Identification of items on loan to a particular borrower or class of borrowers.

(c) Recording of holds or personal reserves for those items on loan but desired by another borrower, often with additional provision for notifying the library staff when the desired item is returned and printing notice to the requester about the availability of the document.

(d) Printing recall notices for items on long-term loan, when required by others.

(e) Renewal of loans.

(f) Notification to the library staff of delinquent borrowers either at the time of an attempted loan or when the borrower is leaving the institution or on request from the library.

(g) Calculation of fine, printing of overdue notices, recording the receipt of fines, and sometimes printing details of fine receipts.

(h) Calculation and printing of statistics.

(i) Provision to handle special categories of users and special types of materials.

(j) Provision to print due date slips.

Obviously, these functions are in addition to the primary functions of the system—charging and discharging. To achieve these objectives, the ACCS is designed to record and manipulate the following three kinds of information (who borrowed what and when) :

- Information about the borrower
- Information about the document
- Information about transactions

These data are collected in a variety of ways. They may be written on a slip entered by the borrower or by a library clerk and then keyed into the system. Alternatively, the minimum possible data elements pertaining to the documents and borrowers may then be obtained automatically from pre-punched machine-readable cards. The complete information of borrowers and documents then be obtained from permanently stored users' and items' files respectively. In a micro-computer system, information about users and documents may be appropriately displayed on the screen by keying in the identification code number and then the relevant information

may be re-written on a transaction file along with the transaction data.

Information regarding the documents can thus be considered either as transitory (i.e., recorded in the transaction file when only single item is removed from its normal location–absence system) or as permanent–inventory system (i.e., stored in the transaction file irrespective of where the book is–inventory system). The data structure and the medium to store the necessary information may depend upon the above two systems. Usually, in a typical ACCS, transaction file, user file, document file and reservation file are maintained. Data elements in these files depend upon the above two systems–absence or inventory systems.

2.4 Automated Cataloguing System (ACS)

The primary objective of an ACS is to create user access catalogues either by online or CD-ROM or microform. In a typical ACS, the following files are maintained and operated :

- Bibliographic file consisting complete cataloguing elements, as required by MARC, CCF, etc.)
- Authority control file
- Catalogue/database, often known as online/off-line public access catalogue
- Item file consisting of records for each documents
- Shelf-list which is separately maintained in the ACS for convenience and security reasons
- Accession file, which strictly speaking is a part of an automated acquisition control system.

The bibliographic and authority control files are usually accessed only by the library staff i.e., those who are involved in cataloguing. Users may be allowed free access to the catalogue/databases; some times users are even allowed to access authority control file but not allowed to edit the authority control file.

An item file is primarily maintained and operated by the library staff to provide services like circulation, document location, etc. The shelf list and accession file are usually operated and maintained by the librarian.

The concept of main entry in any ACS is not that important as compared to the card catalogue, since any data element may retrieve the entire record. Further, in recent years, considerable attention has been given to 'authority control device' in ACS, since it is necessary for effective use in online public access catalogue (OPAC). Authority control service of any other bibliographical information system can also be adopted, without much difficulties, in the local ACS.

In a typical ACS, cataloguing and database management modules must have 'interfaces' with other modules. However, editing capabilities are to be made available only at designated staff terminals; there must be a provision for error-check module to detect and correct common errors.

In any ACS, the provision should be made to share the bibliographic file by all its components. It must have the capacity to provide full MARC bibliographic records and the necessary index. It must accept, retain and output complete bibliographic records either in MARC or Common Communication Format (CCF) or any other format similar with ISO 2079 standard. It must be able to accommodate and allow access by a variety of classification schedules.

Item file consists of records pertaining to items; items may be monographs, serials,

Govt. documents, media, or any other type of materials. Item records contain an item-specific label number, indication of adult or juvenile level, fine level, call number, location, holding facility, and loan period. It also contains the due date, last discharge date, number of circulations since a specified date, holds against the item, etc. This file is maintained primarily for ACCS, especially in the inventory system.

The system must be capable of supporting four levels of record display:

Level 1 (Minimum) : Author, title, call number, publication date

Level 2 (Brief) : Location, call number, main entry, title, sub-title, series, edition, holdings, circulation status

Level 3 (Full) : The data elements as in Level 1 along with notes, and other information normally found in a catalogue card.

Level 4 (Full MARC) : Including all tags, indicators, subject codes, fixed field and variable field data elements.

3. CHALLENGES AND ISSUES

The challenges of library automation are concerned with training programmes, standards to be selected for the bibliographical formats and records, retrospective conversion of the manual catalogue so that the library users will have access to the machine-readable catalogue for the entire collection, indexing policy, hardware and software. Another important challenge facing the profession is the design of automated systems, especially in the absence of computer culture and lack of funds. One of the important factors in the design is introducing 'interactive records', so that transaction in one record automatically causes changes in the other relevant and related records. In designing the system, the factors to be considered are:

(a) Choice of the system

(b) Mode of operation (e.g., PC-based, batch mode, LAN-based, online, etc.)

(c) Method of inputting identification data (of documents and borrowers) for acquisition, circulation, cataloguing, etc.

(d) Available hardware/software.

The major issues in evolving a policy on library automation can be summarised as

- Managing IT resources
- Data security for transborder transfer of data, in databases, etc.
- Standards (difficult to introduce, because of the rapid growth as well as the changes in the information technology; it is however a necessity.)
- Problems due to the international networks (although there are many advantages, problems are many; for instance, domination of the multinationals, transfer of data in audio form, cultural issues, etc.
- Manpower development in IT sector with end-user point of view at university level to take care of annual maintenance (a mass programme may be required to take care of AM).

3.1 Future Scenario

Many institutions in India (even individuals) will participate in one or more networks and then in Internet in the near future. The participation in the internationally well tested and proven networks will enable them to have

- E-mail facility at a reasonable cost; it will enable access to several 'bulletins'
- Facsimile transmission (at nearly 1/5th of the present cost)
- Access to several library catalogues all over the world.

- Preview of headlines, and reviews from certain papers
- Video phone calls, movies on demand
- Access to many CD-ROMs
- Getting into multimedia since hardware is becoming cheaper. Versatile applications make this more useful; e.g. 'Microsoft Bookshelf' is an audio/visual version of the concise edition of Hammond Atlas, American Heritage Dictionary, etc.)

4. CONCLUSION

In this current information technology age, use of computers for library house-keeping operations is not simply feasible, but inevitable. It has become a necessity than anything else. Many networks are now emerging in India. For participation and also the effective utilisation of network resources, it is necessary for the participating members to automate their libraries. Although required hardware for library automation is now available at a reasonable cost; software packages are however not easily available. Before introducing automation, a comprehensive evaluation of the library requirements, software features needed, and capabilities of the hardware for implementing the software has to be made. The procedures to determine hardware requirements and steps involved in evaluating the software are discussed elsewhere (3).

Use of computers greatly enhances the productivity of a library by reducing the time wasted on un-productive work. It further helps in having immediate access to up-to-date information as well as to share the limited resources effectively. It is very important to develop standards for the machine-readable records for bibliographical information in advance, while preparing for automation. Some of the important steps to be considered at the outset are:

- Preparing justification for automation
- Identifying the library functions to be automated
- Analysing the functions in detail from operational point of view ; volume of data to be handled; type of storage media required; outputs required and their media
- Costing
- Identifying or developing the required software
- Selecting/acquiring hardware and software
- Understanding the hardware and software
- Carrying out a pilot study
- Implementation of full fledged programme
- Evaluation

The success of library automation ultimately depends upon the availability of skilled manpower. It is not difficult to learn the basics of computer applications, but most important is the motivation of librarians in using computers, to get into the era of library automation and develop skills and capabilities to automate library house-keeping operations.

5. REFERENCES

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