UNIT 4 NEED FOR COMPUTERIZATION OF LIBRARIES

Structure

4.0 OBJECTIVES

After reading this unit, you will be able to:

- List the features of library automation;
- have an awareness about the need for library automation; and
- identify the areas of library automation.

4.1 INTRODUCTION

Libraries are in the midst of radical changes. These changes are, perhaps, unavoidable and compelling. In the present day context libraries are moving beyond their traditional role as custodians of recorded knowledge and integrating new methods of information storage, retrieval and transmission into their existing services and patterns. They are, at the same time, incorporating the extensive changes that new technologies bring to organizational structures and staff responsibilities. Libraries currently are experiencing technological transition in how services are provided and in what these services are. These changes are attributed in literature to three major phenomena: the information explosion, escalating costs, and the technology revolution. In particular, in the recent past it is the computer and communication technologies, which have drastically changed the working of libraries. While the computer technology provided hitherto unavailable power for the organization and manipulation of information, communication technology provided immense scope for the speedy and accurate dissemination of information.

Over the past few years, there have been many developments in computer technology. One of the revolutionary development has been the advent of comparatively cheap microcomputer systems, with increasingly sophisticated features which can be used for a variety of library applications. Consequently, it is not uncommon to find a microcomputer even in a small library in a developing country like India also. Computers in libraries are used to assist a variety of functions, such as, maintaining and providing access to catalogue items in the collection, managing the circulation of items, controlling the serial publications and allowing the retrieval of information from local files, searching external

online information sources for references or for full text of documents and so on.

Application of computer for library activities is no longer a controversial issue. Many authors have identified and justified the reasons for the development of automated library systems (computer-based library system). In this Unit you will learn the concept of library automation and need for using computers in the libraries.

4.2 LIBRARY AUTOMATION

There is an apparent continuing maturity in writings on the subject of library automation. This is most visible in the number of well-written thoroughly documented descriptions of actual and projected computer based systems and in the studies that critically assesses the accomplishments of specific installations. In order to understand the literature in proper perspective, it is imperative that we should understand the meaning and scope of the term "library automation". The next section demonstrates you the fact that library automation concepts have had different connotations at different times. An understanding of each of these concepts is essential to understand the implications of automation in libraries.

4.2.1 Library Automation: Concepts and definitions

Automation

The word 'Automation' has been derived from a Greek word 'Automose' which means something which has the power of spontaneous motion or self movement (Webster's Third New International Dictionary of English Language, 1966). The term 'automation' was first introduced by D.S. Harder in 1936, who was then with the General Motor Company in United States. He used the term automation to mean automatic handling of parts between progressive production process.

However, the modern usage of the word 'automation' is not in vogue in the above sense. McGraw-Hill Encyclopedia of Science and Technology (1982) defines automation as "a coined word having no precise, generally accepted, technical meaning but widely used to imply the concept 'development' or use of highly automatic machinery or control system". From the above definition one can observe that 'automation' is the application of 'machines' to perform a task automatically. However, "In business world, the words 'automation' and 'computer' are often used synonymously..." (Encyclopedia of Computer Science and Technology, 1975). In most of the literature on automation, the term 'automation' is used in the above sense. Thus, we can conclude that the modern usage of the word 'automation' implies predominant use of 'computers' and other modern technologies for any application/system. In this Unit also the term 'automation' is being used in the same sense.

Library Automation

The word 'library automation' is being used in literature for the last six decades. A perusal of the literature would indicate that many authors have not tried to define the term explicitly. However, they use the term 'library automation' to mean the use of computers as an aid for library activities. However, some authors have tried to define the term. For instance Markerson (1967) says "Library automation in its broadest sense can be taken to mean the employment of machines for library processes. In general, however, library automation has come to mean the application of computers and related data processing equipment to libraries".

Salmon (1975), has tried to give a more exhaustive definition. According to him

"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 thus be distinguished from related fields such as information retrieval, automatic indexing and abstracting, and automatic textual analysis". Further he says that "linguistic purists have argued rightly that the term 'automation' applies more correctly and narrowly to automatic process control..., and 'library automation' is now far the most commonly used term for mechanization of library activities using data processing equipment". From the first part of the above definition, it can be observed that the term 'library automation' is used to imply just the mechanization of traditional and/or manual housekeeping routines of a library. In other words, it confines itself to the use of data processing equipment and associated technology to perform exactly what has always and already been done in libraries through manual process, of course, with the justification of reduced cost and/or increased performance. However, literature shows that such distinction is not maintained. The scope of library automation goes beyond the automation of just housekeeping activities of the libraries.

Hayes and Becker (1970) have tried to explain the concept of library automation by identifying the areas of library automation. According to them, the areas of library automation include:

i) The application of data processing equipment to do/to support the clerical/ repetitive functions found in technical processing, circulation control and serials control;

ii) The application of data processing equipment to the fields of information storage and retrieval, automatic indexing and abstracting, and in reference work; and

iii) The application of computers/data processing equipment for operation research and system analysis.

It is observed that much work has been done in the first two areas, whereas one finds less literature on the third. Though, it might be difficult to find a universally accepted and a comprehensive definition of library automation, one can accept the areas identified by Hayes and Becker as coming under the purview of library automation traditionally. This concept of library automation was more or less applied to the automated systems that were developed till mid 1990s. The features of such automated systems can be summarized as follows:

- Libraries created integrated systems in which traditional library functions of circulation, cataloguing, the public catalogue, acquisitions and serials control were computerized using the library's database as the foundation.

- Systems usually ran on powerful micro, mini or even main frame computers.

- Systems were text based, incorporating no graphics, sound or other multimedia components.

- Systems were fundamentally local, with the emphasis on controlling and accessing resources within a discrete library or network of libraries, not on accessing remote databases or library catalogues.

There has been a sweeping change after the development of web technologies. Notwithstanding these compelling changes, the library automation has undergone

a transformation that reflects changing definitions of library service in general and access to resources in particular. In a nutshell, the rapid technological change has forced a comprehensive re-examination of what library automation really means. Thus, in today's context, the features of automated libraries are as follows:

- Accessible resources are no longer defined as only those residing within the library's four walls.
- The introduction of global networking capabilities to the consumer market has made information around the world as accessible as that in the immediate surroundings - may be more so.
- Data are no longer displayed just as plain old text but also in eye-catching graphical formats.
- Dramatic drops in hardware pricing have made affordable faster machines with huge amounts of storage.

4.3 NEED FOR LIBRARY AUTOMATION

When library mangers consider the issue of automation, the first question they must answer is "does our library require this technology?". In order to justify the substantial expenses involved in automation, the librarian must determine during the planning process whether computers will effectively meet the needs of library staff and patrons.

In his article entitled "Is a Microcomputer Really Necessary in your Library Settings?" Jones summarises the advantages and the disadvantages of computers in libraries and concludes:

"Is a microcomputer necessary for your library environment? Yes, regardless of collection or budget size, or library type; the uses are limited largely by imagination. The trend toward increased use of microcomputers both in libraries and in society at large, may well combine to force any library to use a microcomputer. In so doing, a library enlarges its potential of resource and information sharing, sets the foundation for more effective and informed decision making, and takes a potential big step toward better serving its community of users"

Computer application to library operations has become a subject of vital concern to librarians. Within the past two decades in India, they have begun to realize that advances in technology and improvements in the techniques of information system design are certain to bring about changes in the character of conventional library operations. Scores of libraries in India are already using computers to reduce clerical burdens and accelerate service to readers. Many authors have discussed the reasons/need for library automation. Following are the commonly attributed important reasons for use of computers in libraries:

- **Growth of documents:** The amazing growth of documents especially in areas of science, social sciences and technology in the form of book and non-book materials forced the library planners to utilize technology for the organization of information since the traditional library methods failed to cope with the task.
- **Greater efficiency:** The workflow in the library may be made more rapid, more systematic and efficient with the help of the computer. The records in the computerised store are more accurate, reliable and more accessible

than the manually prepared records. All sorts of housekeeping jobs and information works can be performed with more speed, accuracy and greater efficiency.

- **Co-operation and resource sharing:** No single institution, however resourceful can now collect, organise all documents available all over the world even in a specific field. Nor any one organization can collect all documents in the area of interdisciplinary and multidisciplinary subjects. In the past one decade, there has been an increase in co-operation and resource sharing among the Indian libraries. The following are two specific advantages:

  a) access to more documents and information sources due to co-ordination and co-operation of many libraries in a system

  b) less expenditure, because the total cost is shared by a number of libraries in the system

Lancaster, one of the authorities in the library automation, lists some of the possible reasons (as shown below) for applying technology to library operations. The first three, which are inter-related, all involve staffing needs. When automation was first introduced into libraries, a major justification was that it would save money by reducing the number of staff required or, at least, allowing the library to cope with increasing demands without the need for extra people.

- To cope with increasing demands
- To reduce staff or prevent staff increases
- To allow more activities to be performed by clerical and paraprofessional staff
- To improve existing services
- To provide new services
- To collect better data to aid overall management of the library.

Lucy A Tedd, in her text book on "An Introduction to Computer Based Library Systems," succinctly lists the following three reasons for using computers in libraries:

- To provide a better service at lesser or no great a cost. The provision of online access (by users or staff) to library's catalogue, the ability to access much more information via the online search services than would have been possible via printed sources and the ability to produce easily management information, such as the average cost of new books, number of books lent to undergraduate physics students in one term, etc., are just some examples of new or improved services to both library staff or library users that are possible with computer-based systems.

- To give added benefits at lesser cost. Tedd tries to explain how computerization could benefit the libraries to provide services at a lesser cost than traditional/manual services. She says many librarians have found over the last ten years or so that they have been unable to recruit more staff but that their workloads have increased, perhaps by an increase in student numbers or by acquiring more books, or by the library and its services being used more. In order to cope with such a situation many librarians have decided to use computer systems.

- To complete the tasks more accurately, more quickly and with increased control with previous systems. Typically such tasks are clerical, routine and repetitive and thus prone to human error. The dependence of a system on some outdated, unserviceable or old piece of equipment, such as a data collection device in a circulation control system is another reason for setting up a new computer-based approach.

Many more authors have discussed this issue in their articles/books. Without listing all of them here, we enumerate a few common reasons cited by them:

- Automation becomes a pre-requisite to acquire compatibility with qualitative requirements as such in global perspective.

- There are indications that traditional media as well as functional approach of information providers is increasingly being influenced by digital mentality and any escapists route by librarians can reduce them to the periphery of knowledge profession. It is evident that traditional forms of information are being substituted by newer and technologically superior developments such as CD-ROMs, Web resources, etc.

- Exposure to the latest trends in emerging technology related expertise and adoption of the required ones guarantee proper access to information sources world-wide for optional use.

- The information seeking behaviours of the users is also undergoing dramatic changes. Many user studies reveal that overwhelming proliferation of technologies in every field of the society has influenced the information seekers also. They are turning into digitally minded creatures aspiring for machine based access of information.

- The combination of continued high inflation in operating costs (especially in acquisitions, the explosion in the amount of published material, the emergence of numerous kinds of non-print information such as images, databases and musical performance in electronic format and the decay of acidic paper on which major part of most collections is printed) makes it impossible today for institutions to maintain or build comprehensive collections as they did in the past. So automation is needed.

- New digital and telecommunication technologies offer possibilities for resource sharing and collection development and management that were unimaginable a generation ago. Thus, it enables users to have access to any information in any format quickly and at reasonable cost without regard to where the information is located physically.

Other, equally valid, reasons may be quoted by librarians setting up such systems. However, not all computer-based systems have been implemented in libraries for such worthwhile reasons; Makenzie reports some less reputable reasons which include:

- Keeping up with the Jones' (i.e., keeping pace with a neighbouring library).

- Professional advancement with a research grant available to meet the cost

- Use of spare machine capacity.

- Removal of drudgery from staff.

By studying the viewpoints of different authors, we can say that introduction of

computer and other aspects of automation are only a part of modernization process. Automation in libraries is not a panacea in itself. Computerization requires a certain pre-conditions set of situations, technically qualified manpower, a long term planning, properly oriented end users or as a whole, what may be known as automation mentality. Particularly in a country like India, emergence of such an environment is an unavoidable necessity to obtain desired results. Computer literacy is an important factor that encompasses all links in information transfer chain. Further the application of latest information technology now available will help to remove barriers of distance and time, and drudgery of repeated manual efforts in the library routines. Now the time is ripe for the user/reader to get the information more consistently. The automation of libraries will continue to improve the effectiveness of the libraries.

4.4 AREAS OF LIBRARY AUTOMATION

Libraries have always been depending on technology. Starting from typewriter to telephone to punched cards to computers, libraries have been embracing the appropriate technologies as and when they are available. Automation that began in the libraries of the universities has spread rapidly to other types of libraries. Special libraries, particularly, adopted the technologies more quickly than others. Computers have been used in following areas of libraries:

- For automating clerical, financial, and record-keeping functions;
- For automating library-specific activities such as cataloguing, acquisitions, circulation and serials control; and
- For automating areas that required for patron use in the libraries.

Let us give a bird's eye view of the issues involved in automating these areas.

4.4.1 Office Automation

When a library first ventures into the arena of computer use, it is often in an effort to facilitate the work of its staff members. Some libraries choose to begin with their management and clerical workload using microcomputers for word processing, for database management, and for financial planning and book keeping. This type of automation is often referred to as "office automation". Within this, there are four applications normally associated with office automation in library environment. They are word processing, spreadsheets, database management and telecommunications. Let us briefly discuss each of them:

- **Word processing:** It is often one of the first computerized activities to be introduced into an office environment, and library officer are no exception to this trend. The use of word processing to replace most typing tasks can take an enormous burden of repetitive work from the shoulders of the support staff. Most libraries generate a vast array of form letters, ranging from notices of overdue materials to claims on missing serial issues. Word processing allows the staff to keep these forms available for easy customising and printing, and eliminates the need to retype entire letters when making relatively small changes in the text. It also reduces the need for use of messy carbons for duplicate letters, as multiple copies of a single document can easily be printed. Its similarity to the traditional typing process makes it easier for staff to feel comfortable with the new technology, while the ease of revision, storage, and retrieval of documents will ensure that the technology will be appreciated by all who use it.

- **Spreadsheets:** Financial planning and budgeting have in the past been managed primarily with pencil and paper spreadsheets and ledgers. Electronic spreadsheet programs make it possible to automate these activities, resulting in greatly improved error-checking, and providing the capacity for instantaneous recalculation of financial documents. Spreadsheet programs are an invaluable tool for managers involved in any aspect of financial record-keeping or planning.

- **Database management:** Database management programs allow users to maintain inventories, mailing lists, and other records of information that in the past have taken up substantial space in paper format. They also speed the process of making across-the-board changes to the format or content of individual records in a collection of information. Everything from patron lists to equipment inventories can be maintained in database files, allowing easy access to specific information within the files, and a wide range of reporting options.

- **Telecommunications:** This software provides the capacity to connect to a multitude of outside resources. A few of the applications of these programs in the library office environment are: the transfer of documents to outside locations, ranging from other libraries to administrative offices; connection to outside databases for retrieving information; and connection to in-house resources such as mini- or mainframe computers for retrieval of centralized administrative information or use of institutional electronic mail facilities.

4.4.2 Automation of House-keeping Functions

Automating the administrative functions that are unique to library environment falls under this category. The functions that are normally considered for automation under this category include maintaining of circulation records, recording library acquisitions, creating an online system for entry and retrieval of catalogue records or managing journal subscriptions.

In some ways, developments in the field of automation of house-keeping functions mirror those in office automation; both these fields focus on the automation of repetitive tasks, in order to free staff for activities requiring more judgement and skill. In other ways, the automation of housekeeping functions is completely different from that of office automation; whereas the latter is found in any number of varied office environments using every conceivable type of computer system, the former is found exclusively in the library environment, and its more sprecialized nature and clientele constrains it to a far smaller range of available systems and programs.

Let us discuss very briefly about housekeeping functions. For the sake of having a background we shall give a cursory look at each one of these housekeeping activities.

- **Acquisitions:** Acquisitions is mainly repetitive work/routine because it is not unusual to find the same information being repeated at various stages right from selection to the procurement processes. Acquisitions involves a great deal of record keeping as well as facing usual difficulties of tracking orders and determining when claims should be produced. Manual acquisitions systems are labour- and paper-intensive, and usually produce only a limited amount of management information.Automated acquisitions reduce the amount of paper handling and generate a wide variety of reports which help in taking appropriate decisions at various stages of acquisition operation. ‘Acquisitions’ encompasses all aspects of the procurement of all types of

library materials, whether by purchase, gift or exchange, from the request stage through transfer of materials to cataloguing. Fiscal processes are also included within the scope of acquisitions. The major objectives of automated acquisitions systems may be summarized as follows:

- To reduce labour- and paper-intensive work involved in manual acquisitions
- To maintain up- to-date information/record of all activities involved in acquisitions
- To have effective and efficient control over ordering, claiming and cancellation functions
- To provide accurate and timely financial information
- To provide necessary management information reports, whenever they are required.

- **Serials Control**: Serials management, an integral part of library operations, has become increasingly complex over the years. Serials management always has been an area that is labour intensive, demanding high degree attention to accuracy and detail. The benefits of the application of automation in other areas of library operations is now well established; it is a natural progression for librarians and system designers now to seek to apply the power of computer to control one of librarianship's most troublesome processes. The major objectives of automated serials control system may be summarized as follows :
  - To record and maintain accurately and timely the serials holdings data;
  - To have effective and efficient control over subscriptions, claiming and cancellations activities;
  - To have a good control over binding and related activities;
  - To provide accurate and timely financial information;
  - To provide necessary management information reports, whenever they are required;
  - To reduce labour-and time-consuming work involved in manual serials control systems.

- **Circulation Control:** Circulation is a central and highly visible function of a typical library. Circulation, which is often compared with inventory control, involves a great deal of record keeping and correspondingly, staff time. It is highly essential that the records have to be accurate and all information has to be updated immediately after each transaction. In other words, circulation control is useful if it is in online real- time interactive mode. Circulation, by definition, encompasses all aspects of patron loan processing and management, including closed reserves, holds, material booking and in-library use of the collection. Automated support for circulation control vastly improve library's ability to rapidly and accurately record the loan transactions, to monitor these transactions, to record return of lent items and to support other related circulation functions. The objectives of an automated circulation control may be summarised as follows:
  - To record timely and accurately the loan transaction data

- To have efficient and effective control over dues, fines and records
- To accurately provide information about status of a book and/or library loan status of a borrower
- To provide necessary statistical and management reports.

- **Cataloguing:** Cataloguing is a traditional and fundamental activity practiced among libraries world over. Cataloguing systems, whether manual or automated, encompass two interrelated activities: descriptive cataloguing and the production of library catalogue. Automation support to cataloguing has benefited both these aspects. As an intellectual activity requiring considerable decision making, descriptive cataloguing is time-consuming. Therefore, many libraries experience cataloguing backlogs which impede the flow of materials into the library. This results in library catalogues not representing the collections fully and accurately. As a labour intensive activity requiring special training and some times considerable experience, descriptive cataloguing, can prove expensive, so much so that the cost of cataloguing of a given item may approach or even exceed the value of the item itself. The objectives for automation support to cataloguing are:
  - To speed-up the processing of materials into the collection
  - To reduce the clerical effort, stationery (such as work sheets, cards etc) and unit cost of cataloguing a work; and
  - To act as a common means to library materials across libraries.

4.4.3 Automation of Areas that are Required for Patron Use in the Libraries

As computers have become more common as standard tools in both schools and businesses, an entirely new medium for information dissemination has grown up around them. Over the past five to ten years user expectations from libraries have risen markedly owing to a number of specific developments, including:

- vastly expanded storage of indexes, statistical databases and document databases within the library
- full-text storage of documents, complete with full-text keyword searching and on-demand printing
- access by users to library databases from home or office, with direct downloading of information and text on demand
- the ability to access remote databases across the country and the world, and to download information and text on demand
- storage of pictorial and graphic material
- the availability of ‘intelligent systems’ providing transparent, one-step searching and access to various library in-house and remote databases.

The public has entered cyberspace and expects its local information provider, the library, to provide the launching pad. Accordingly, today’s integrated system not only must provide modules automating the traditional library functions but also must be capable of connecting through the local system into systems of other suppliers, databases-bibliographic and full content, online and CD-ROM- and the

Internet. Users now expect their library systems among other thing to be able to:

- provide seamless integration between system gateways and remote and local databases through the public catalogue module
- allow for access by remote users to the library's resources, either by telephone or via an Internet connection
- access resources available on the Internet using a variety of graphical and multimedia-based software interfaces.

4.5 SUMMARY

In this unit you have been introduced to the concept of automation. You may notice that the scope and meaning of automation has been changing over the years. In the previous units you were introduced to the fundamentals of computers. It is not enough, however, to know about computers. It is also necessary to know *where* and *why* the computers have to be used in libraries. Computers are ideally suited to the performance of routine, repetitive tasks and can thereby free staff members for more creative and intellectual activities. If computers are used simply to replicate current routines, many advantages that automated systems can bring to a library will not be gained. To avoid this mistake, librarians must carefully assess the needs of their staff and of their patrons, and clarify the specific uses they envision for their computer facilities. The section in this Unit on "Need for library automation" clearly establishes the various reasons and benefits of automating a library. Further, you have been introduced briefly to the areas where the computers and other related technologies are being used in libraries.

4.6 ANSWERS TO SELF CHECK EXERCISES

1) In the present day context the automated libraries have the following features:

   i) Library resources available beyond four walls of the library.

   ii) Sharing and access of information throughout the world with the help of global networks.

   iii) Information available in attractive graphical formats.

   iv) Faster machines with huge amount of data storage capability.

2) Computers can be used effectively for the following library activities:

   i) Office automation – clerical, financial and record keeping functions.

   ii) House keeping operations – cataloguing, acquisition, circulation and serials control.

   iii) Patron based library and information service.

4.7 KEYWORDS

Cyberspace **:** The domain of those linked by computer via

international networks, bulletin based services etc.

Housekeeping Operations : Routine library operations such a book ordering, accessioning, cataloguing, processing and the circulation etc. of documents and other library materials.

4.8 REFERENCES AND FURTHER READING

Cohn, John M. Kelsey, Ann L and Fiels, Keith Michael. (1998). Planning for Library Automation: A Practical Guide. London: Library Association.

Jones, Beverly L. "Is a microcomputer really necessary in your library setting?" In: Micromputers for Library Decision Making: Issues, Trends, and Applications. Edited by Peter Hermon and Charles R. McClure. p.3-17.

Kimber, R.T. (1974). Automation in Libraries. 2nd edition. Oxford: Perabamon.

Lane, Elizabeth S. (1990). Micro-computer Management and Maintenancefor Libraries. London, Meckler.

Rowley, Jennifer E Computers for Libraries (1993). 3rd edn. London: Library Association.

Saffady, Williams. (1983). Introduction to Automation for Librarians. Chicago: ALA, 1983

Tedd, Lucy A. (1993). An Introduction to Computer-based Library Systems. 3rd ed. Chichester: Wiley.