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339en03

# MODERN LIBRARY: AUTOMATED, DIGITAL AND VIRTUAL

## 3.1 INTRODUCTION

You are already familiar with different types of libraries and their functions and services. Application of computers, in particular, to library operations has got various implications. At present, users need pinpointed, speedy and in-depth information on a specific field and that too as quickly as possible. Multifold increase in the information output and its usage has made it a challenge for the librarians to organize and disseminate required information quickly. Organizing this enormous information, manually and by conventional methods is time consuming. Therefore, there is urgent need to computerize libraries to provide efficient and timely services to the users. Moreover, in this busy world every minute of the user is valuable. It has thus, become a necessity for any service oriented organization to save the time of the user and fulfill the fourth Law of Library Science, i.e., Save the time of the user. The speed of processing, the conservation of space by avoiding catalogue cabinets, the accuracy and incorruptibility of the data and reliability of the systems are some of the important considerations in advocating computerized management of libraries.

In this lesson, you will be introduced to various aspects involved in automation of libraries, concepts of digital and virtual libraries. Before going further, we shall understand in this lesson impact of computers in modern society.



## 3.2 OBJECTIVES

After studying this lesson, you will be able to:

- describe the impact of computers in modern society;
- explain the need for library automation;



- discuss different areas of application of library automation;
- explain the salient features of an automated library; and
- explain the difference between digital and virtual libraries.

### 3.3 IMPACT OF COMPUTERS IN MODERN SOCIETY

Development of Computers is one of the greatest scientific achievements of the 20<sup>th</sup> century. This is the age of computers and a vast majority of people are using them. Today computers have become an integral part of our everyday life. Computer technology has made communication possible from one part of the world to the other in seconds. Computer technology has brought about many changes in the way we live in this present society. This has affected not only the individuals per se but also all organizations and society.

In our individual lives, we have seen computers, having a major impact on the way we are able to communicate with each other. In the earlier years, when computer technology was still in its infancy, reliance was on other forms of communication methods, such as telegraph, post and later on telephone. These were the only forms used for keeping in touch. Although, these forms in their own way were effective, but at times these (e.g. post and telegraph) proved to be unreliable with delays in receiving information. With the introduction of network computers connected to phones as well as mobile phones, today we are able to send and receive messages by E-mails via Internet. This provides cheaper, easier and quicker method of sending and receiving information. In addition, the technology also provides the facility to make video calls and video conferencing on computers and mobile phones. Computers have really changed the way people work. Computers handle many tasks in business, education, manufacturing, transportation and many fields. Computers process and produce new information so quickly and accurately that they are changing people's view of the world.

Automation in our society occurs in three stages: (i) we automate what we have been doing manually; (ii) we find what we do, is changing; and (iii) society changes in response to these forces (Martin, 1989). According to Martin, we need not worry on this account because libraries have always stood ahead in the use of technology. Hence, this development is a good prediction for libraries of 21<sup>st</sup> century and information society.

### 3.4 NEED FOR LIBRARY AUTOMATION

Information, as an essential input for development process, has been well accepted by scientists, technologists, researchers, teachers, etc., and becomes valuable only when it acts upon its target user in time.

**Notes**

Any planning and development activity needs quick access to right information, whereas, searching and retrieving information manually is tedious and time consuming. The options available are either to process and store information electronically or rely on accessing large databases remotely to meet users' urgent needs. Hence, we are forced to depend on some means to ease the process and in this context automation is the only solution. Recognizing this need, librarians have started thinking seriously for automating their library activities, which enables them to put their entire collection for the timely interaction of the users with the system. The need for automation arises due to:

- literature explosion and information overloads;
- need for handling large amount of data/information;
- complexity and scattering of information;
- interdisciplinary nature of research and information;
- speedy processing of information and its retrieval;
- flexibility in information search;
- better bibliographic control at local/regional/national/international level;
- economic implications of new information technology;
- geographical and other barriers to communication;
- optimum utilization of available resources either inside or outside the library;
- improve the existing services (from the point of quality, user friendliness, regularity, etc.);
- avoid duplication of work; and
- utilize the services of the existing staff effectively.

**3.5 LIBRARY AUTOMATION**

Library Automation refers to the phenomenon of mechanization of traditional library activities, such as, acquisition, cataloguing, circulation, serial control, etc. In other words, library automation refers to the use of computers and other technologies to minimize human intervention in the functioning of a library. Library automation may be defined as the application of computers to perform traditional library housekeeping activities such as, acquisition, cataloguing, circulation, and serials control.

The main reasons or purposes of library automation are to:

- increase operational efficiency of the library;
- cope with increasing demand for services;
- improve the quality of services;



### Notes

- provide new services which are otherwise not possible;
- improve the management of information products and services;
- facilitate wider access to information for the users;
- facilitate wider dissemination of information product and services;
- participate in resource sharing/ library networks and
- enable easy communication with other libraries and professionals.

The library entering into automation should examine the above reasons and prioritize them according to their work. As a strategy, prioritization of the reasons should be done in consultation with the user community, management and the library staff. This will help in building awareness among the users, and staff. This helps in seeking concurrence for implementation and adopting process. It is also important to look into various factors that influence adoption of library automation.

Although, computers have a major role in library automation, telecommunication and reprography technology have equally important role to play, because of the support they offer to library automation.



### INTEXT QUESTIONS 3.1

1. Define Library Automation.
2. What are the main reasons for library automation?

### 3.6 AREAS OF APPLICATION OF LIBRARY AUTOMATION

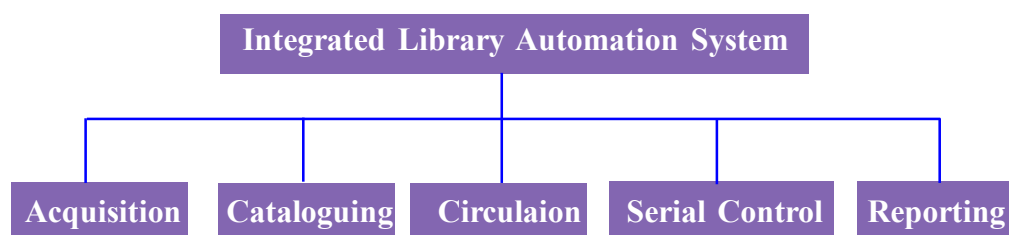
Traditional library work consisting of acquisitions, technical processing, serials control, circulation and reference services entail time consuming manual work. Though, these activities are essential for proper functioning of a library, they consume considerable professional staff time that might otherwise go towards user services and library development. Moreover, this work consists of a number of inter-related activities, the data generated being useful in different sections. Manual work involves repetition of work in different activities. The aim of automation thus, is to integrate these activities and minimize repetition of work. Integrated library management software (ILMS) packages are available, which are used to automate libraries. ILMS package integrates all the activities and routines of a library.

The basic activities of library automation irrespective of the type or size of a library are:



- (i) Acquisition
- (ii) Cataloguing
- (iii) Circulation
- (iv) Serials Control, and
- (v) Reporting.

The above mentioned activities are closely connected and are to be performed in a sequence that leads to better library services. Diagrammatically, a computerized integrated library management system with various operations is shown below :



**Fig.3.1: Integrated Library Management System**

The main objectives of library automation are to improve the level of service and quality of output, and to fulfil needs that cannot be achieved by manual system, such as: (i) sharing of resources, (ii) information that appears only in electronic format (e.g. CD-ROM, Internet resources, databases, etc.

Let us discuss the main areas of applications of library automation in subsequent sections.

### 3.6.1 Acquisition

The acquisition division in a library acquires reading material (books, electronic material, maps, charts, etc). Other reading material including journals, newspapers, databases, e-books, etc. are acquired by the serials/periodicals division.

Manual acquisition system requires the maintenance of vast amount of data, innumerable files, records, etc., which involve tedious routine and repetitive tasks. The computers can perform these tasks faster and more accurately. The following are the main tasks in the acquisition section.

- Selection of documents
- Ordering of documents
- Create purchase orders
- Claiming/cancellation of documents
- Receiving/invoice processing

**Notes**

- Extended procurements
- Gift tracking
- Maintaining information about all library related funds
- Tracking fund allocations and adjustments
- Expenditure out of allocated funds
- Cash balance
- Updating of fiscal information through recording of specific transactions, and
- Tracking up-to-date expenditures.

In a computerized system, bibliographic data of a document once entered can be used for other routine activities such as, for duplicate checking, placing orders, receiving, accessioning and importing data to the catalogue module for entering cataloguing details. This avoids re-entering of bibliographic details for the same document, as is normally done for each activity in a manual system. All the above mentioned tasks are also carried out faster and more efficiently by the computerized system than the manual system.

**3.6.2 Cataloguing**

Once a book is received in the library, it is processed, beginning with accessioning followed by classification and cataloguing. Catalogues are the windows to the library collection and their automation has far reaching effect on the quality of services. In a manual environment, much valuable time of professional staff is invested in the preparation of cards for each book, sorting and filing of the cards. Checking for duplicate entries is another tedious and time-consuming process. In an automated system, once the relevant data is processed and is made available on the computer, the catalogue can be generated in a standard format. Then exchange records with other libraries as part of a library network and generation of various approaches is very fast and efficient. Checking for duplication can be done quite efficiently through computers as it facilitates search from any approach to any library material. The computerized catalogue can generate list of recent arrivals, print catalogue cards and prepare bibliographies.

**(a) Online Public Access Catalogue (OPAC)**

Cataloguing activities using ILMs produces an electronic catalogue, that provides access to catalogue for users, which is limited to search and display and is called an Online Public Access Catalogue.

**Notes**

OPAC is a computerized catalogue of library resources available to public for searching online. In other words, OPAC is an interactive search module of an automated integrated library management system (ILMS). OPAC is very dynamic, in the sense, that it is highly flexible, easy and economical to maintain and capable to meet almost every possible approach of the user. The searching capability is very fast and accurate.

Earlier OPACs were developed as standalone online catalogues, which users searched on the computer terminal available in the library. With the arrival of Internet, most of the libraries have made their OPACs accessible via Internet, which is accessible to users all over the world on 24X7 basis. Users can search OPAC remotely and find information online. The search facility apprises the users about the availability of each item for circulation, including current status of individual copies of a title and reserve status.

**(b) Web OPAC**

Connecting the web with the online catalogue is a natural and unavoidable goal for libraries today and these are called Web OPAC. Web OPAC is an OPAC which is provided on the Web and with the help of Internet any user can access it from anywhere.

Web OPAC is similar to OPAC in searching and browsing. The main difference between OPAC and Web OPAC is that OPAC can facilitate a user to access library materials from the library or campus of an Institute through Local Area Network(LAN), whereas, Web OPAC can be searched from any corner of the globe through Internet. In simple words, a user can search the library catalogue through Web OPAC anywhere in the world. For example you can search the catalogue of NIOS library by clicking the web link at <http://220.156.188.239:8080/jopacv11/html/SearchForm>

**3.6.3 Circulation**

Circulation section involves direct interaction between users and staff, and therefore requires efficient and speedy services. The main functions in the circulation section are as follows:

- Issue (charge) of documents
- Return (discharge) of documents
- Renewal of documents
- Loan periods of documents
- Processing schedules
- Hold of documents
- Message notices to users

**Notes**

- Transaction recording devices for off-line processing, and
- Inventory control.

The transactions at the circulation desk, such as: charging (issue), discharging (return), re-issue, reservations, over-due reminders and statistics, etc., are time consuming, highly labour intensive and error prone. Automation in circulation activities benefits the library. Barcode facilities tremendously improve the speed, efficiency and accuracy of the circulation transactions.

Circulation module works with the help of two master files, i.e. database of users and books. Integration of circulation module with library catalogue allows the library staff to know about the status of a document and also the details of the user in case it is issued to her/him. This facility helps to send notices for overdue books. Late fee calculation is another activity to be performed in circulation section for books returned after due date.

The trend these days is towards integration of circulation control systems with other functions such as online public access systems, inter-library loans, electronic mail reminders, book reservations, book status, etc. thereby, saving the time of users. These days radio frequency identification (RFID) has also been introduced for automation in circulation that also prevents theft of books.

### 3.6.4 Serials Control

Serials control is a very complex process involving large number of publications and expenditure to be handled. The following are the main tasks performed in the serials control section.

- Subscription of journals
- Subscription of e-journals & databases
- Subscription/renewals of journals
- Subscription/renewals of e-journals & databases
- Claiming of missing issues
- Replacements of journals
- Monographic serials, and
- Invoice processing.

Further, the problem of keeping track of receipts, reminders and non-receipt claims, periodicity change, merger of titles, etc., is quite a task to be managed manually, and thus, need special treatment under serials control.

Automation makes most of these tasks very easy and efficient. Apart from these, generation of many types of manually is time consuming and at times not at all possible, which is facilitated by the use of computers. For example, lists of



serials-subject-wise, frequency-wise, currency wise, country of origin, publisher-wise, etc., can be easily generated.

### 3.6.5 Reporting

In addition to the operations mentioned above, the Integrated Library Management System (ILMS) has to be managed in such a way that users get maximum benefit, safeguards are in place and timely access of material is ensured. The reporting module of ILMS includes the following.

- Various reports and statistics related to library activities
- Tools for the analysis of statistical information
- Maintains Lists of user, publishers and suppliers
- Stock verification and develops stock verification report, etc.

Besides the above, this module generates messages for library staff and users. It also generates reports on lost books, missing books, books sent for binding, and so on for the purpose of library administration.



### INTEXT QUESTIONS 3.2

1. Enumerate different areas of library automation.
2. What is the full form of OPAC? How does it help a user?

## 3.7 SALIENT FEATURES OF AN AUTOMATED LIBRARY

A library after automating its routines should provide automated services to bring in the effect of automation to the front end (user). As discussed above in the circulation division, the bar coding of books and user details, enables the automated issue and return of books, which is the service any automated library provides. The salient features of an automated library are to:

- provide users with timely access to library materials;
- eliminate routine tasks or perform them more efficiently;
- reduce the amount of time spent on material acquisition, serials management, budget administration and record keeping;
- support new means of information retrieval by introducing users to global information;
- allow users to use search strategies that exceed those that can be used with card catalogue;



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## Notes

- allow users to search library's collection from locations outside the library's walls, and
- motivate users and equip them with problem solving and information retrieval skills.



### INTEXT QUESTIONS 3.3

#### 1. Fill in the blanks with suitable answer.

- An automated library provides users with timely access to .....
- An automated library eliminates .....tasks.
- An automated library reduces the amount of ..... spent on material acquisition.
- An automated library supports new means of ..... by introducing users to global information.
- An automated library allows users to use ..... that exceed those that can be used with card catalogue.
- An automated library allows users to search ..... from locations outside the library's walls.
- An automated library motivates users and ..... skills.

### 3.8 DIGITAL AND VIRTUAL LIBRARIES

Today, libraries are much more than storehouses for books, journals, and newspapers, in print form. Present day libraries apart from print resources, acquire e-resources, audio/visual material, multimedia material and other resources depending upon the demands from the users. This change is evident in all kinds of libraries. However, one thing that has not changed is the universe of information or knowledge; it is forever expanding and is continuing to do so at ever increasing speeds. Digital and virtual libraries are the outcome of this speed. The following sections will explain digital and virtual libraries in brief.

#### 3.8.1 Digital Library

There are many definitions of digital libraries, in simple words; a digital library is a library in which collections are stored in digital or electronic form and accessible on computers and other electronic devices. In other words, a digital



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library is a collection of documents in organized electronic form, available for access on the Internet or on CD-ROM (compact-disk read-only memory) disks. Depending on the nature of a specific library, a user may be able to access magazine articles, books, papers, images, sound files, and videos using computers.

Digital libraries, like traditional libraries, select, acquire, make available, and preserve collections. The major differences are that digital libraries consist of resources in machine-readable form only. This implies that the traditional concept of collection must be revised to accommodate materials that are accessible electronically.

A Digital library is an organized collection of multimedia data with information management methods that represent the data as useful information and knowledge to people in a variety of social and organizational contexts. In general, the digital library is a structured, processed and organized digital repository of knowledge. Such a repository is created to serve the user community as the traditional library. One of the best examples of a digital library is, Digital Library of India (DLI).

DLI is a digital library of books, predominantly in Indian languages, available to everyone over the Internet. Books are searchable and free-to-read. In addition, it provides links to six online Indian newspapers such as Times of India, The Hindu, Indian Express, Deccan Herald.

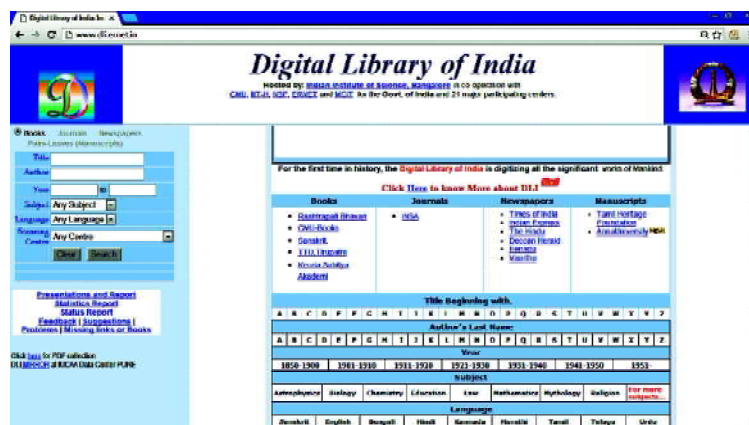


Fig.3.2: Snapshot of Digital Library of India < <http://www.dli.ernet.in/>>

Examples:

- (i) Traditional Knowledge Digital Library, Ministry of Health & Family Welfare, Government of India. <http://www.tkdli.res.in/tkdli/langdefault/common/Home.asp?GL=Eng>
- (ii) Digital Library of India <http://www.dli.ernet.in/>
- (iii) Indira Gandhi National Centre for the Arts (IGNCA) Digital Library, New Delhi. [http://www.ignca.nic.in/dgt\\_0001.htm](http://www.ignca.nic.in/dgt_0001.htm)



## Notes

- (iv) Vidyanidhi: Digital Library at Department of Library and Information Science, Mysore University, Mysore. <http://www.vidyanidhi.org.in/home/index.html>

### 3.8.2 Virtual Library

The virtual library is a collection of full text e-books, journals and databases from various publishers and sources which can be accessed by library members at any time from any Internet connected computer, laptop or other portable device. In simple words, **a virtual library is the library without walls**. It is virtual in the sense that it does not have any physical collection of resources. It aggregates distributed resources and provides links from its website.

The key characteristics of a true virtual library are given below:

- There is no corresponding physical collection.
- Documents are available in electronic format.
- Documents are not stored in any location of the library.
- Library only categorizes and provides links to these resources.
- Documents can be accessed from any workstation.
- Documents are retrieved and delivered as and when required, and
- Effective search and browse facilities are available on the website of the virtual library.

Virtual libraries often contain more up-to-date information than physical collections. Their sources can be searched more efficiently than those in physical libraries, and the information they contain can be updated more frequently. One of the best examples of a virtual library is WWW Virtual Library (Fig. 3.3).

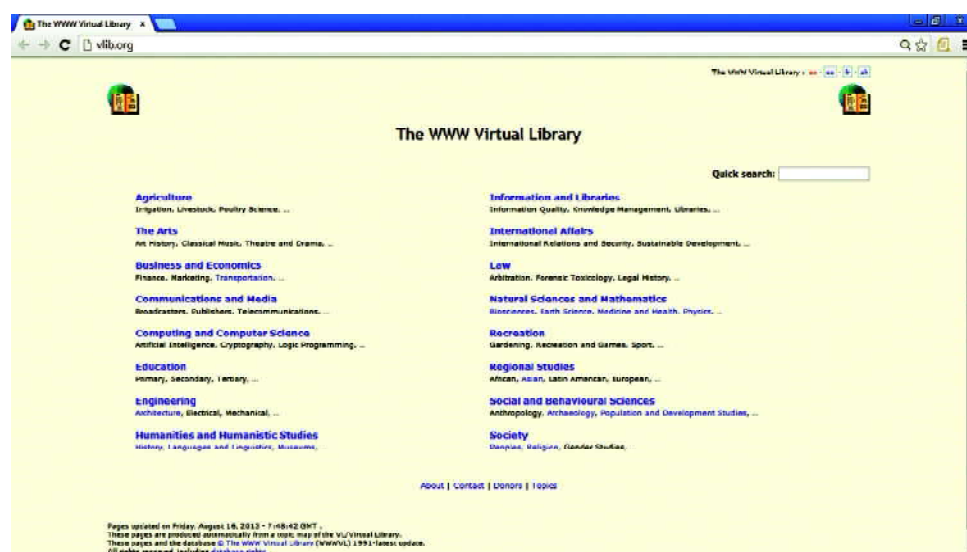


Fig.3.3: Snapshot of WWW Virtual Library < <http://vlib.org/>>



*Examples:*

- (i) Mathematics WWW Virtual Library, maintained by the Florida State University Department of Mathematics. <<http://www.math.fsu.edu/Virtual/>>
- (ii) Alabama Virtual Library < <http://www.avl.lib.al.us/>>

### 3.8.3 Digital Library Vs. Virtual Library

The terms digital library and virtual library are used interchangeably but it is not correct. They both have different characteristics which makes them different.

A digital library is a library consisting of digital materials and services. Digital materials are items that are stored, processed and transferred via digital devices and networks and are accessible using computers. A digital library has place based collection of e-resources and may have even print resources. It provides access to e-resources held in-house as well as provide links to e-resources held somewhere else. For example, Digital Library of India provides link to online edition of various newspapers.

On the other hand, a virtual library is the library which exists only virtually, that is, the library does not exist in real life. It consists of materials that are organized in a virtual space using computers and computer networks. The emphasis in virtual libraries is on organization and access, not on developing physical collections. For example, The WWW Virtual Library is a catalogue of web pages compiled by a confederation of volunteers, who compile pages of key links for particular area in which they have the expertise. Individual Web pages of these links reside on hundreds of different servers around the world. A set of catalogue pages, linking these web pages is maintained by the website of the virtual library at <http://www.vlib.org/>.



#### INTEXT QUESTIONS 3.4

1. What is a digital library?
2. List any two digital libraries in India.
3. What is a virtual library?



#### WHAT YOU HAVE LEARNT

- Computer technology has brought about many changes in the way we live in this present society.

## MODULE - 1

LIBRARY, INFORMATION  
AND SOCIETY



### Notes

## Modern Library: Automated, Digital and Virtual

- Computer based systems and telecommunication network continue to be used in more and more in libraries with the overall aim of providing better services to the user.
- Library automation may be defined as the application of computers to perform traditional library housekeeping activities such as, acquisition, cataloguing, circulation, and serials control.
- The main objective of library automation is to improve the level of service and quality of output.
- The main areas of library automation are: (i) Acquisition, (ii) Cataloguing, (iii) Circulation, (iv) OPAC, and (v) Serials control.
- A digital library is a collection of documents in organized electronic form, available for access on the Internet or on CD-ROM (compact-disk read-only memory) disks. Depending on the specific library, a user may be able to access magazine articles, books, papers, images, sound files, and videos using computers.
- A virtual library is the library which exists only virtually that is, the library does not exist in real life. It can consist of materials that are organized in a virtual space using computers and computer networks. The emphasis in virtual libraries is on organization and access, not on developing physical collections.
- A Virtual library is the library without walls and without any physical collection..



### TERMINAL QUESTIONS

1. Discuss the need for library automation.
2. Briefly explain the areas of library automation.
3. What is the main difference OPAC and Web OPAC?
4. Describe the salient features of an automated library.
5. Distinguish between digital and virtual library.



### ANSWER TO INTEXT QUESTIONS

3.1

1. Library automation may be defined as the application of computers to perform traditional library housekeeping activities such as, acquisition, cataloguing, circulation, and serials control.



## Notes

2. The reasons for library automation are: (i) to increase operational efficiency (ii) to cope with increasing demand for services; (iii) to improve the quality of services; (iv) to provide new services which are otherwise not possible; (v) to improve the management of information products and services; (vi) to facilitate wider access to information for the users; (vii) to facilitate wider dissemination of information product and services; (viii) to participate in resource sharing/ library networks; and (ix) to enable easy communication with other libraries and professionals.

## 3.2

1. The main areas of library automation are: (i) Acquisition, (ii) Cataloguing, (iii) Circulation, (iv) OPAC, and (v) Serials control.
2. OPAC stands for Online Public Access Catalogue. It is a computerized catalogue of library resources available to public for searching online. In other words, OPAC is an interactive search module of an automated Integrated Library Management System (ILMS). OPAC is very dynamic, in the sense, that it is highly flexible, easy and economical to maintain and capable to meet almost every possible approach of the user. The searching capability is very fast and accurate.

## 3.3

1. (a) library materials, (b) routine, (c) time, (d) information retrieval, (e) search strategies (f) library's collection, and (g) equip them with information retrieval.

## 3.4

1. A digital library is a collection of documents in organized electronic form, available for access on the Internet or on CD-ROM (compact-disk read-only memory) disks.
2. Two digital libraries in India are: Traditional Knowledge Digital Library, and Digital Library of India.
3. A Virtual library is a library without walls.

## GLOSSARY

- Acquisitions** The method of procurement of all types of library materials, whether by purchase, gift or exchange.
- Barcode** A barcode is an optical machine-readable representation of data relating to the object to which it is attached.
- Cataloguing** It is a process by which we render a collection of bibliographic materials arranged in a chosen order readily accessible to the users of the library.

## MODULE - 1

LIBRARY, INFORMATION  
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Notes

- Circulation** Covers all the aspects associated with the borrowing of library materials by the users of the library.
- IT** Information Technology (IT) is the technology to access, store, process and transmit information. It includes processing and telecommunication technologies.
- Serials Control** The activities related to acquiring, processing and maintaining periodicals in a library.
- OPAC** Online Public Access Catalogue. It can facilitate a user to access library materials while in the library with the help of library automation software.
- RFID** Radio Frequency Identification (RFID) is the use of a wireless non-contact system that uses radio-frequency electromagnetic fields to transfer data from a tag attached to an object, for the purposes of automatic identification and tracking.
- Web OPAC** Web OPAC is an OPAC. It is accessible all the time from anywhere in the world with the help of Internet.

### SUGGESTED ACTIVITIES

Visit the nearest University Library and do the following tasks:

- (i) Observe and note down different library activities;
- (ii) Find out ILMS being used by the University library;
- (iii) Search a book title using OPAC;
- (iv) List the different modules in ILMS;
- (v) Enumerate the different functions in each module of ILMS, and
- (vi) Issue a book using barcode scanner.
- (vii) Visit website of Digital Library of India, search for mission, goal and current status of the library and prepare a write up of the same.
- (viii) Visit Website of WWW virtual library and find out following information about it- How it started, where it is located, and who runs it?

### WEBSITES

- (i) Traditional Knowledge Digital Library, Ministry of Health & Family Welfare, Government of India.  
<<http://www.tkdl.res.in/tkdl/langdefault/common/Home.asp?GL=Eng>>
- (ii) Digital Library of India <<http://www.dli.ernet.in/>>.

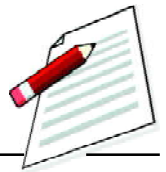


(iii) Indira Gandhi National Centre for the Arts (IGNCA) Digital Library, New Delhi.

<[http://www.ignca.nic.in/dgt\\_0001.htm](http://www.ignca.nic.in/dgt_0001.htm)>

(iv) Vidyanidhi: Digital Library at Department of Library and Information Science, Mysore University, Mysore.

<<http://www.vidyanidhi.org.in/home/index.html>>



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