BLOCK 4

RESOURCE SHARING NETWORKS

UNIT 12 LIBRARY AND INFORMATION NETWORKS

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12.0 OBJECTIVES

The need for sharing the resources of libraries has been recognised long back. It is not possible for any library to acquire all the resources and also satisfy the information requirements of all the users. As a result libraries and information centres joined hands to form consortia and networks. Though sharing of resources was started with library materials, subsequently it has been recognised that sharing of other resources like, infrastructure, human resources, etc. are equally important. The development of technology augmented the formation of such networks. After reading this Unit, you will be able to understand:

- the concepts of library and information networks;
- major components of library networks;
- need and basic characteristics of library networks;
- services and activities of a typical library network ;
- activities of major international and national library networks; and
- contributions made by the international organizations towards the growth and development of library networks.

12.1 INTRODUCTION

The library and information centre stands at the hub of the academic, research and professional activities and act as a centre for garnering knowledge and contributing to the existing pool of knowledge. Their role is to make the existing pool of knowledge available to its users either through resources available in its own collection or from other libraries. For long, the libraries have been facing challenges in meeting the demands of their users caused by exponential growth in number of publications, their escalating costs and reduction in budget allocations made to the libraries. While there is a continuous demand from the users to increase the resources and services, the manpower- physical infrastructure and financial resources made available to the libraries is decreasing. These factors have contributed to the necessity of establishing library networks for resource sharing amongst libraries. The technological advancements that offer newer methods of information processing, retrieval and dissemination in electronic environment has worked as an enabling factor.

Application of new information technology has brought in dramatic changes in the library and information field. With technological advancement, libraries and information centres around the world have computerized their library routines and have developed databases for shared use on computer networks. Besides improving services and operations for improved performance, libraries have also been able to evolve effective computer networks with an aim to optimise utilization of resources and facilities.

The library and information networks have potential to improve library services in several ways. It brings down the cost of information products and services in the network environment in shared mode. It enables libraries to offer need-based services to the end users eliminating the limitation of size, distance and language barriers among them. With evolution in library networks, the emphasis has moved from the networks as physical entities to the resources available through the networks. These network-accessible resources include databases of library holdings, journal articles, electronic text, images, video and audio files, scientific and technical data, etc.

A network is developed when a group of libraries and / or information centres decide to exchange information using computers. The library networks use existing communication facilities to establish networks amongst libraries that agree to cooperate amongst themselves through more or less formal agreements with a view of pooling their resources and to offer better services to the users. The participating libraries generally follow identical or compatible rules and procedures.

The term "Network" is increasingly used in place of "resource sharing" or "cooperative systems". Networking and modernization are becoming very important in all types of libraries as they enable the users to have access to the resources of many other libraries in addition to their own. The term "Library Consortium" is also used, some times, interchangeably with the Library Network. Such library consortia are being formed these days not only to share the resources of libraries but also to subscribe to electronic resources on behalf of a group of institutions. With the rapid advancements in the technology, several library networks are either functional or are in the formative stage in India.

12.2 OBJECTIVES OF LIBRARY AND INFORMATION NETWORKS

Major objectives of a library and information network are to:

- encourage interlibrary cooperation and resource sharing at all level amongst members of the network;
- provide help to member institutions in computerisation of their libraries, retro-conversion of bibliographic records and development of standardized databases for shared use;
- develop union catalogues of various resources so as to provide reliable access to document collection available in member libraries;
- provide effective access to combined holdings of library resources through computerized databases of various member institutions;
- provide document delivery services to member libraries;
- rationalization of acquisition of information resources in member libraries and optimise their usage through resource sharing;
- evolve/adapt protocols and standards, guidelines, methods and procedures for bibliographic records, their storage, inter-library loan, hardware and software;
- facilitate communication amongst users of member institutions;
- provide training to members of library staff of participating libraries for effective use of libraries in the network;
- guide member libraries in the effective implementation and utilization of current and upcoming information technologies;
- provide access to information resources at reduced rates through consortium arrangements; and
- develop and promote collaborative digitisation projects.

12.3 CHARACTERISTICS OF LIBRARY AND INFORMATION NETWORKS

The library and information networks are characterized by the following aspects:

12.3.1 Equal Opportunity of Access to All Members

A library network provides equitable access to all its core resources to all its member libraries. However, resources that are licensed from a third party may be offered on subscription basis.

12.3.2 Interdependence

Members of a library network depend on each other for sharing their resources. The interdependency may go beyond sharing of document resources to sharing of expertise, manpower, equipments, etc.

12.3.3 Use of Standards and Protocols

Use of common standards and protocols is a pre-requisite to successful implementation

of a library and information network. The standards and protocols exist for network technology, database structure, information representation and for bibliographic records. Use of well-developed, widely-used standards and their uniform implementation help in improving the quality of services, interoperability of databases and digital repositories.

12.3.4 Shared Decision

The decisions of members of the executive committee of a library and information network are equitably applicable to all member institutions. All members of a library network are obliged to stand by the decision taken collectively.

12.3.5 Broad-Based Library Services

Library and information networks generally offer a broad range of library services including union catalogue of books and journals, access to union catalogues and licensed databases, licensing of e-resources from publishers, table of contents services, database of experts in various disciplines, etc.

12.3.6 Integration and Coordination

Library and information networks provide opportunity for integration and coordination of resources at the level of collection, manpower and expertise.

12.3.7 Centralisation

Network activities are generally centralized. Large bibliographic databases are centrally stored and maintained although they have interfaces for online data feeding and updation. It is, however, possible to maintain distributed databases with single search interface using standard protocols.

12.3.8 Economics

The cost involved in maintaining activities and functioning of a library and information network including licensing and hosting of third-party databases get distributed amongst subscribers and members of the network. The products and services through the network, therefore, tends to be more economic than by the subscription directly by the libraries individually.

12.3.9 International Reach and Opportunity for Further Collaboration

The networks may be connected to other networks through which such networks can have an opportunity to learn from each other and work in collaboration.

12.3.10 Research and Development

The library and information networks, with their elaborate infrastructure and large number of databases, provide an opportunity for research and development work. The usage statistics of databases and electronic resources, feedback from participating libraries, etc. provides input for further research and analysis.

12.4 NEED

The library networks have several potentials to facilitate sharing information among different library and information centres at local, regional, national and international level. Library networks eliminate the size, distance and language barriers among users through resource sharing. Basic needs of library networks are:

12.4.1 Physical Limitation

No library is an island. No single library can acquire, store and effectively use all publications that have been published. Even Library of Congress and British Library with their acquisition activities spread all over the world can not claim to acquire all scholarly publications.

12.4.2 Economic Limitation

No single library or institution has economic means to acquire all documents that are published even on a single subject. While the purchasing power of libraries are going down with declining library budgets, the cost of publications have registered a sharp increase in past few decades. Devaluation of local currency (i.e., Rupees) against US Dollar or other currencies like Euro and British Pounds particularly in developing countries have further compounded the situation. While the annual increase in the rates of scholarly literature vary from discipline to discipline, the average increase ranges from 7% to 10%.

12.4.3 Literature Explosion

The scholarly literature has grown in exponential proportion with spur of research activities in science and technology after World War II. It is said that half the scientists the world has ever produced are living and working actively. The number of scholarly journals has grown from one hundred in 1800 to a thousand by 1850, and to nearly ten thousand by 1900. The Online version of Ulrich's International Periodical Directory lists 2,40,000 serial publications. It has been observed that on the average the volume of scientific literature doubles every decade.

12.4.4 Increased Awareness and Demand from Users

The rapid growth of Internet and the Web and its ever-increasing usage has exposed the users to a plethora of information sources. These technology-driven changes has presented a scenario where the users have access to a vast array or information sources generated by commercial publishers, professional societies and individual researchers. Today's users are, therefore, much more aware of information resources that are available in their respective discipline. The advances in technology and its availability at lower cost, has therefore, raised demand of users on the libraries.

Existence of library network with their web-based union catalogues has also led to the awareness of users regarding availability of resources in other libraries and provision of inter-library loan.

12.5 LIBRARY AND INFORMATION NETWORKS

12.5.1 Definition

The basic purpose of a library network is to share resources and services amongst member libraries. A library network is broadly defined as group of libraries and / or information centres that are inter-connected to form a system with an aim to help each other with information needs of their clientele. UNISIST-II Main Working Document defines the information network as "a set of inter-related information systems associated with communication facilities, which are cooperating through more or less formal agreements and institutional agreements, in order to jointly implement information handling operations, with a view to pooling their resources and to offer better services to the users. They generally follow identical or compatible rules and procedures".

Susan Martin defines a network as a "group of individuals or organizations that are interconnected to form a system to accomplish some specified goal. This linkage must include a communications mechanism, and many networks exist for the express purpose of facilitating certain types of communication among members."

Raynard C. Swank defines library networks as a "concept that includes the development of cooperative systems of libraries on geographical, subject or other lines, each with some kind of centre that not only coordinates the internal activities of the system but also serves as the system's outlet to and inlet from the centres of other systems."

12.5.2 History and Evolution

The library networks have its roots in library cooperation and resources sharing being practiced for centuries. The use of computers for automated generation of indexing and abstracting services in early 1970s and subsequent idea of sharing such massive information through the communication networks gave birth to the concept of online databases. These initiatives led to growth and development of computerized databases and online search services like DIALOG, BRS and DIMDI. The American Library Association and the US Office of Education cosponsored a landmark National Conference on Inter-library Communications and Information Networks held in Warrenton, Virginia, USA in 1970. The conference recognized the need for establishing networks amongst libraries in USA for effective utilization of combined information resources available in American libraries.

Sustained interest in the library networks lies in the opportunity that they provide for centralized services that are highly economic. A long-standing example of such services is the production of catalogue cards by the Library of Congress in 1968. Centralized technical processing of documents started by the Library of Congress was replicated in individual states and localities in USA and later in several European countries. Besides, centralized processing, the library networks have greater potentials to increase resource sharing. Recognition of the value of sharing rather than duplicating resources resulted in the development of the existing inter-library loan system, cooperative arrangements such as Farmington plan and the National Union Catalogue in USA. The pace of creation and development of library networks has been accelerating for past two decades. Some of the important library networks at international level include OCLC, RLG, CURL, AARLIN and JANET.

Owing to inadequate communication facilities in India, library networks and online search facilities were almost non-existent in India until the end of 1970. The growth of library Networks in India can be traced to the initiatives taken by NISSAT in the year 1986. The CALIBNET was established in 1986 followed by the DELNET in 1988 with funding from the NISSAT. The DELNET emerged as the first operational network and is currently promoted with the support of the National Informatics Centre (NIC). Establishment of the INFLIBNET by the University Grants Commission (UGC) in 1988 as a national-level network can be considered as a major turning point in the evolution of library networks in India. The INFLIBNET is working as an agency promoting automation of universities libraries in India and connecting the through the network. The INFLIBNET has recently been given the task to subscribing electronic resources in consortia mode for the universities in India under UGC's INFONET programme. A few more Library networks in India that had emerged include: MALIBNET in Chennai in 1993 with support from the INSDOC (now NISCAIR), BALNET in Bangalore in 1997, etc.

Self Check Exercise

1) Define Library and Information Networks? Discuss the main objectives of library and information networks?

Note : i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of this Unit.

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12.6 COMPONENTS OF LIBRARY AND INFORMATION NETWORKS

Major constituents of a library and information networks are given below:

12.6.1 Human Network

While databases, databanks, computer and communication infrastructure are important for successful implementation of a library and information network, the most important component of a library network is the human manpower and their willingness to participate and share resources of their respective libraries. While a library network focuses primarily on the availability and delivery of information, it is the human resource that makes it possible. Willing professional librarians and associated professional staff members can work together to produce innovative and far-reaching improvements in library services. Conferences, annual meets, training programmes for members of a library network helps to bring the members together and induces a sense of comradeship amongst them.

12.6.2 Online Databases

The emphasis in a library network is on the contents and users of the contents rather than on technology of networking. The library networks lease communication and network infrastructure of other data networks and Internet Service Providers and concentrate on developing contents and making them accessible to member institutions. The database and databanks are the backbone of a library network. The concept of online databases itself has emerged from the idea of sharing information. A database is non-redundant, multi-usable, independent and physically available set of complete data, on a subject, stored in an organized and structured manner to allow users to search the information in an interactive mode. A library network may develop some of its own databases and license or acquire other databases from their producers.

The bibliographic records for a database developed in-house by a library network may come from all or some of its member institutions so as to make a large database of bibliographic records with information about its location in member institutions. WorldCat, for example, is a worldwide union catalogue of books created and maintained collectively by more than 9,000 member institutions of OCLC with 57 million bibliographic records. DELNET's union catalogue of books, for example contains more than 30 lakhs records from 844 member institutions.

Besides developing and maintaining their own databases, the library networks may also lease or outright purchase databases and databanks from publishers and host them on their network to make them accessible to their members. OCLC, for example, hosts several third-party databases that member institutions can subscribe.

12.6.3 Computer Hardware and Software Infrastructure

A library and information network requires computer infrastructure to host databases and databank developed and maintained by it. The servers are used to host databases, digital objects, browse & search interfaces and to facilitate their access to the member institutions. Servers for a library network need to be computationally powerful; have adequate main memory (RAM) to handle the expected work; have large amount of secured disc storage for the database(s) and digital objects. A library network may require a number of specialized servers for different tasks so as to distribute the workload on to different servers. It would require one or more computer server(s) to host indices and databases and one or more object server(s) to store digital objects and other multimedia objects. However, for a smaller library network, several distinct activities can be performed on a single server. It is important that the server is scalable so that additional storage, processing power or networking capabilities can be added, whenever required.

A library network would also require communication equipments like communication switches, routers, hubs, repeaters, modems and other items required for setting-up a Local Area Network (LAN). These hardware and software items are required for setting-up any network and need not be specific to a library network.

A library network also requires a number of software packages to handle its highly specialized and diversified resources, activities and services. Different software packages are required to handle different components and activities of a library network. It requires a robust database management system (DBMS or RDBMS) to store bibliographic records, a search engine to provide browse and search facility to the union database of bibliographic records or digital objects and an online data entry interface to failitate creation of records for new books acquired by member libraries. A library network may also require a document imaging software for scanning of documents, an RDBMS to store and organize these digital objects and a digital library software to provide access to the digital objects with associated metadata. Since a single integrated software package from a single vendor is not available, a software for a library network may be a system with components added onto an open architecture framework.

Besides, computer software and hardware infrastructure at the network end, the member libraries also require computers with necessary hardware and software devices in order to connect to the Internet and to the servers hosted by the network. Users at the member institutions require multimedia PC equipped with an Internet Browser like Internet Explorer or Netscape Navigator to access Internet and the services offered by the network.

12.6.4 Data Networks

The servers of a library network are required to be hooked on to the Internet so as to make them accessible to its members. Most library networks use infrastructure of other data networks and Internet Service Providers. For example, DELNET and INFLIBNET use network infrastructure of NICNET and ERNET respectively.

12.6.5 Members

Number of members in a library network is a yardstick of its success. A library network is more meaningful and effective if it has larger number of members. The cost involved in maintaining activities and functioning of a library network including licensing and hosting of third-party databases get distributed amongst subscribers and members of the library network. The benefit of larger number of members in a library network is suitably used and passed on to its members. The collective strength of members of a library network provides it the power to bargain with the publishers for better rates of subscription and terms of licenses.

12.7 TYPES OF LIBRARY AND INFORMATION NETWORKS

The library and information networks perform multiple activities including providing access to full-text and bibliographic databases, creation, maintenance and updation of catalogues on member libraries, document delivery services and promotion of resource sharing activities amongst member libraries. The library and information networks can be grouped into following three categories based on their size, subject speciality and activities:

- Large networks concerned primarily with computerized large-scale technical processing, e.g. OCLC, RLIN, etc.;
- Small networks or consortia concerned with acquisition of electronic resources for member libraries and training of staff;
- Limited-purpose networks cooperating with respect to limited special subject areas, e.g. FORSA;
- Limited-purpose networks concerned primarily with inter-library loan and union catalogue activities.

12.7.1 Types of Library Networks Based on Geographical Region

The library and information networks can be divided into the following categories based on their geographical regions they serve:

City or Metropolitan Library Networks

The library networks. confining their activities and membership to a given city or metropolitan area can be categorized as Metropolitan Library Networks, such as ADINET, PUNENET, BONET, etc. in India.

Regional Library Networks

There are regional academic groups founded by the member institutions for specific purposes. APSONET in Andhra Pradesh is one such example.

National Library Networks

Library networks whose activities are spread over the entire country can be categorized as National Library Networks. INFLIBNET in India is a national network in terms of its membership and spread of activities.

International Library Networks

The library networks like OCLC can be considered as international networks with 50,540 libraries as its members in 84 countries.

12.7.2 Types of Library Networks Based on Their Activities

The library networks can also be grouped under the following categories based on activities undertaken by them.

Umbrella or Supermarket

Some of the networks, such as OCLC, are "Umbrella" or "Supermarkets" type covering all fields and offer multitude of services. Libraries can take membership of such networks for accessing selected databases or for using its union catalogue.

Bibliographic Utility Networks

The most common purpose of a library network is library automation and resource sharing which generally take multiple forms. Most other activities, such as creation of union catalogues, document delivery services and copy cataloguing are its by-products. They consist of a large union bibliographic database of member libraries, accessible online to members for copy cataloguing or for creation of new bibliographic records for new books. Such networks also provide cataloguing information on magnetic tapes or CD ROM for retro-conversion of manual library catalogue into machine-readable catalogues. The largest bibliographic utilities, such as OCLC provide a database for cataloguing records created by member libraries, these records are used for copy cataloguing, interlibrary loan and other functions.

Online Search Service Networks

Online search networks host a number of databases in machine-readable form which are accessible online through telecommunication links. A user can directly interrogate the databases mounted on host's computer through a computer terminal using a communication package and communication links in two-way interactive mode. These databases are hired / leased to the online search services (also called vendors, spinners or retailers), from their owners (information provider - often the publishers of the printed version of databases). Some of the important online bibliographic search services networks include: DIALOG, ORBIT, STN, BRS and Datastar in USA; BLAISE and Pergamon Infoline in UK; DIMDI in Germany; Euronet and Diane in Europe; ESA-IRS in Italy; and CAN/OLE in Canada. Most of the online search services networks are now accessible over the Internet with web interface.

Service Centre Networks

Service centre networks concentrate on providing services to the member library in a networked environment. Such services may include cataloguing, literature search, database access, news service, etc. These networks act as a distributor or aggregator for online

databases for offering computer-based online information retrieval services. Pennsylvania Library Network (PENLIN) and Illinois Library and Information Network (ILLINET) are examples of service centre networks.

Networks for Subscription to Electronic Resources

Although most library networks undertake multiple activities, group licensing / purchasing of electronic resources is one of the major activity of modern library networks also called consortium. OhioLink, for example, is a state-wide network which first automated all the publicly-funded academic libraries in Ohio state of USA, then added access to jointly purchased databases as one of its key activities. OhioLink now includes many other libraries and is a leader in group purchasing of and access to digital information. Group licensing / purchasing of electronic resources is one of the key activities of INDEST Consortium in India.

Based on **funding source**, membership of a library network may be mandatory for certain category of institutions because it is associated with a government body such as a state. For example, all CSIR laboratories are members of CSIR Consortium because the Department of Scientific and Industrial Research, Govt. of India fund it. On the other hand, FORSA Consortium in India is a voluntary organization and its membership is open to institutions interested in subscription to resources in astrophysics and astronomy. The INDEST Consortium, on the other hands, has Government-funding and therefore, its membership is mandatory for IITs, NITs and IIMs.

12.8 ACTIVITIES AND SERVICES OF LIBRARY NETWORKS

A library network can offer a number of services depending upon its objectives. It is advantageous for a network to take-up multiple numbers of activities and services since the cost incurred on these services get distributed amongst members. Moreover, since a library network represents a large number of institutions, it has better bargaining power and economy of scales. A library network, therefore, can provide a large number of services in a highly cost-effective manner. Important services that a library network can provide are given below.

12.8.1 Cooperative Cataloguing

Catalogue of a library is an index to its collection. Likewise a union catalogue of libraries in a network serve as an index to combined collection of libraries in the network. The union catalogue was, therefore, taken up as one of the first activity taken-up by most of the resource sharing initiatives. The sharing of cataloguing services began with centralized cataloguing and distribution of printed catalogue cards by the Library of Congress in 1901. The British National Bibliography (BNB) was launched in 1950 accompanied with catalogue card service though on a more limited scale than that of the Library of Congress. Fully automated library networks offer interfaces for online cataloguing that allow member libraries not only to access the database but also create bibliographic records online for new books or download records for books that already exist. The centralized cataloguing saves times, avoid duplication, encourage inter-library loan and facilitates downloading of cataloguing information directly into the local library catalogue. At the same time the participating libraries have to follow the same rules and standards decided upon. Many times all the details may not be required by individual libraries Some of the important catalogue-based services that library networks can take-up include:

- shared cataloguing of monographs, serials, and non-book materials
- union catalogue of books, serials, theses & dissertations, non-book materials
- online catalogue access for shared cataloguing and location identification
- catalogue production in card, book, magnetic tape, floppy, CD-ROM form
- retrospective conversion
- preparation of authority files

12.8.2 Cooperative Cataloguing of Internet Resources: Subject Gateways

The portal sites or gateways redirect a user to the holders of the original digital material. A subject gateway can be defined as a facility that allow easier access to web-based resources in a defined subject area. The simplest types of subject gateways are sets of web pages containing list of links to resources. Some gateways index their lists of links and provide a simple search facility. More advanced gateways offer a much-enhanced service via a system consisting of a resource database and various indexes, which can be searched and / or browsed throughout a web-based interface.

Subject gateway is an important component of a library web site designed for the library users so as to help them discover high-quality information on the Internet in a quick and effective way. In the traditional information environment human intermediaries, such as publishers and librarians, filter and process information so that users can search catalogues and indexes of organized knowledge as opposed to raw data and information. Subject gateways work on the same principle, i.e., they employ subject experts and information professionals to select, classify and catalogue Internet resources to aid search and retrieval for the users. Users are offered access to a database of Internet resources descriptions which they can search by keywords or browse by subject area. A description of each resource is provided to help users assess very quickly its origin, content and nature, enabling them to decide if it is worth investigating them further. In the process users get benefited from the expertise of librarians and subject experts with subject gateways rather than having to locate, evaluate, filter and organize the resources themselves.

Library networks can invite member institutions to commence collaborative cataloguing of Internet resources involving participation of member its institutions. Specialized software are now available as freeware or as priced software to create and maintain professionally developed subject gateways in a collaborative environment avoiding duplication of efforts.

12.8.3 Database Services

The library networks can subscribe to electronic resources (including bibliographic databases, full-text electronic resources and reference sources) on behalf of member institutions on cost-sharing basis, host them locally on their own computer infrastructure and provide access to resources hosted locally to their member libraries on payment basis. Besides being economic, local availability of international databases make the access faster and reliable, reduces transpacific network traffic and bandwidth congestion, and cost incurred on it. Depending upon the licensing arrangements, local hosting of databases also ensures availability of archives of databases locally. The local hosting of databases was practiced regularly by several library networks in developed countries before advent of the Internet and availability of web-based electronic resources. It is still practiced by several library networks and library consortia like CALIS (China), CONCERT (Taiwan) and OhoiLink and OCLC (USA).

The library networks can also build value-aded services around subscribed resources including retrospective searches (bibliographic services) for member institutions, citation analysis for individual researchers and institutions, current awareness, alert services, etc.

12.8.4 Document Delivery Services

The libraries depend on inter-library loan and document delivery services to meet the demands of their users for research articles that are not available in their collection. The libraries cooperate with other libraries to provide these services to their users. Library networks can offer document delivery service as one of its services to member institutions. The library networks can offer document delivery service from journal articles that are accessible or physically available in the libraries of member institutions. Document delivery service widen access to all journals subscribed in member libraries to all users across the library network. The library networks may develop customized databases that provide content-level access to all journals available amongst member libraries. The INDEST

Consortium in India, for example, uses JGATE Custom Contents for Consortium (JCCC), which provides content-level access to 4,500 journals available / accessible in all the IITs, IISc and IIMs and facilitate semi-automated document delivery service. Besides, IISc, IITs and IIMs, the JCCC is made accessible to all other core members of the INDEST Consortium.

12.8.5 Inter Library Loan

Document collection in a library can broadly be classified in two groups, i.e., collection that caters to the core interest of the institution and the other that serves peripheral interest of its users. With the financial crunch, the library could curb its acquisitions in the peripheral areas and depends on inter-library loan for demands of their users in areas of peripheral interest to the institute. Professional associations like IASLIC has developed Inter Library Loan Code to facilitate the activity.

The primary mechanism for sharing materials being practiced for centuries is known as inter-library loan that involves mutual lending and borrowing of materials among libraries. Resource sharing through formal and informal arrangements helps a library to deliver wider range of services. Library networks with their union catalogue of books and journals are instrumental in promoting inter-library loan. Such networks can work proactively to facilitate inter-library loan amongst member libraries by checking the availability, getting the book issued and returned on behalf of member libraries. The library networks may deploy specially trained staff, courier service and transportation for this purpose.

Technological advancements offer new dimensions to resource sharing with shift from sharing bibliographic information to sharing full-text electronic resources. Most electronic publishers allow inter-library loan wherein a library subscribing to a given electronic resource in full-text can take a printout of a paper and send it to the requesting library. Fully automated comprehensive inter-library loans and document delivery management system like VDX (Virtual Document eXchange) and ARIEL are now available that facilitate resource sharing between libraries and deliver documents directly to users.

12.8.6 Shared Electronic Reference / Real-time Reference Service

Electronic reference service / live reference service can be offered by a library network. Digital reference service, also called "Ask-An-Expert" or "Ask-A-Librarian" services are Internet-based question and answer service that connect users with individuals who possess specialized subject knowledge and skills in conducting precision searches. As opposed to static web pages, digital reference services use the Internet to place people in contact with people who can answer specific question and instruct users on developing certain skills. The people who serve as digital reference experts (also called volunteers or mentors) are most of the time information specialists, affiliated to various libraries.

"Ask-a-Librarian" services have a web-based question submission form or an e-mail address or both made available through the web sites of library network. Users may submit questions by using either form. Once a question is read by a service, it is assigned to an individual expert for answering. An expert responds to the question with factual information and or a list of information resources. The response is either sent to the user's e-mail account or is posted on the web so that the user can access it after a certain period of time. Many services have informative web sites that include archives of questions and answers and a set of FAQs. Users are usually encouraged to browse archives and FAQs before submitting a question in case sufficient information already exists.

A number of library networks have started experimenting with offering real time digital reference service using chat software, live interactive communication activities, bulletin board services, interactive customer assistance services using related technologies.

The Internet chat technology serves as an innovative method to extend and enhance traditional and remote reference service. While digital reference service is asynchronous method of information delivery, the Internet chat provides the benefit of synchronous communication between a user and a reference librarian (or mentor). Interactive reference services facilitate a user to talk to a real, live reference librarian at any time of day or night from any where in the world. Unlike with email reference, the librarian can perform a sort of reference interview by seeking clarifications from the user. The librarian can conduct Internet searches and push websites onto the patron's browser, and can receive immediate feedback from the patron as to whether his or her question has been answered to his satisfaction. Most libraries currently involved in real-time reference service are part of a collaborative library network so that they can share staffing and work around the clock to truly provide reference service any time. Library of Congress Collaborative Digital Reference Service (http://www.loc.gov/rr/digref/cdrshome.html) is one of such services. Several institutions including Cornell University, Internet Public Library, Michigan State University, North Carolina University are offering Internet chat-based service using software like LivePerson, AOL Instant Messenger, Conference Room and Netscape Chat. The librarians have observed that their relatively new chat-based service logged significantly more questions in a relatively short time than did their well established e-mail digital reference service.

LiveRef(sm) (http://www.public.iastate.edu/~CYBERSTACKS/LiveRef.htm) maintains an online registry of real-time digital reference services.

12.8.7 Collective Acquisition of Resources

The goal of a library network is to share equitably the collective resources of member libraries. While the existing resources can be shared through inter-library loan, library networks can achieve greater benefit by implementing centralized resource acquisition programme and by rationalization of its acquisitions. While multiple copies of frequently used documents can be acquired at discounted rates, inadvertent duplication of expensive resources or expensive resources can be avoided. Collective acquisition of resources through library networks not only brings-in transparency and accountability but also demonstrate a commitment to greater collaboration. The collaborative building and distribution of information resources provides the best solution for improving the quantity of, and access to resources essential for conducting research, teaching and in rendering service.

The process and operations where collaboration can be achieved includes: i) pre-order searching; ii) integration of new bibliographic records in OPAC; iii) account keeping; iv) maintenance of address file for supplier / publisher name, etc; v) negotiations for purchase of multiple copies of books ; and vi) updation of databases when the documents are withdrawn.

12.8.8 Consortium Purchase

Consortia-based subscription to e-resources is a way of maximising access to e-resources at minimum cost. It is a feasible strategy to increase the access to electronic resources across institutions at a lower cost. The consortia-based subscription can be successfully deployed to meet the pressures such as diminishing budget, increased user's demand and rising cost of journals. The libraries all over the world are forming consortia of all types and at all levels with the objective to take advantage of current global network to promote better, faster and more cost-effective means of providing access to electronic information resources to the information seekers. The collective strength of consortia members facilitates the libraries to get the benefit of wider access to electronic resources at an affordable cost and at the best terms and conditions. Moreover, the technology has changed the expectations of researchers. Consortia based services helps library networks to:

- increase the cost-benefit per subscription for participating institutions;
- promote the rational use of funds;
- ensure continuous and long-term subscription to the subscribed resources;
- provide opportunities of local storage and hosting of subscribed information resources;
- help in developing local expertise in operation and handling of electronic resources;
- prompt institutions with common interest to come together and purchase e-resources in a consortia mode at reduced cost; and
- provide improved resource sharing amongst member institutions.

12.8.9 Joint Archives and Cooperative Storage Facilities

Cooperative storage of documents is a recent trend, whereby a group of libraries finances the construction of a high-density facility with advanced climate-control systems. Materials stored in such a facility are considered important for research but are not used often enough to justify space in the prime-use area. Sharing of documents is in-built in the concept of cooperative storage since there is a little point in storing multiple copies of commonly owned documents. Dedicated remote-storage facilities have the potential for superior storage conditions because, in the absence of user interaction, the environment is much easier to control. Cooperative storage facilities need not be necessarily a repository for discarded or duplicate materials, it may also be an active facility that organize, house and disseminate materials too expensive or perhaps too little used to justify acquisition in an individual institution.

Besides printed documents, members of a library network can also have joint computer storage facilities that can be used for hosting archives and backfiles that can be made accessible to the members of the consortium. Such joint facilities may also be implemented for setting up e-print archives across members of a library network. The responsibility of digital archives can also be taken-up in a distributed mode by members of a library network.

12.8.10 Shared Core Collections

Besides subscription to full-text electronic resources and bibliographic databases, the library networks may invest in purchase of back volumes of journals and costly reference sources. Several publishers, including Elsevier Science (Science Direct), Wiley Interscience, Institute of Physics (IoP) and Macmillan offer their electronic backfiles that may be loaded locally onto Intranet servers for local access. NetLibrary (OCLC), Wiley and Kluwer offer e-books to members of a library network wherein each member may buy a definite number of e-books and all members of the network may share such electronic books.

12.8.11 Shared Digital Library Project Development

A library network may extend its activities towards shared digital library projects. Some of the important activities that a library network may take-up are:

- setting-up Interoperable Electronic Submission of Theses and Dissertations
- electronic Preprint Server for Members of a network
- web-based Union Catalogue of Journals and other Serial Publications
- web-based Union Catalogue of Books; and
- cooperative Cataloguing of Internet-based Electronic Resources.

Member institutions of a library network may be prompted to set-up e-print servers for depositing electronic theses and dissertation, preprints of research papers, technical

and research reports and other similar research material of mutual interest. These institutions as policy may be asked to use OAI-complaint software to ensure interoperability of digital collections. Several OAI-complaint software are available in public domain. Some of the important OAI-complaint software are: D-Space, E-print Archives, CDSWare, etc. IGNOU has taken initiative to establish consortia for OAI. The essence of the open archives approach is to enable access to web-accessible material through interoperable repositories for metadata sharing, publishing and archiving.

Moreover, while individual institutions in a library network may set-up their digital repositories and function as electronic publishers and data providers, the library network may take-up the role of service provider, i.e., it may harvest bibliographic data from all OAI-complaint institutional repositories set-up in the member institutions and provide a unified index to all institutional repositories with link to respective repositories for full text. In effect, these servers would act as a unified indices to digital libraries distributed across member institutions.

12.8.12 Training of Users and Library Staff

Training programme is a crucial requirement for functioning of library and information network to facilitate optimum use of subscribed electronic resources. It acts as a bridge to facilitate better communication amongst members of a library network and find answers to common problems. Educational programmes are essential both for the user as well as for the library staff Such programmes make users competent to conduct their own searches more effectively. "On-the-job" training programmes are better not only because it benefits large number of users but it also solve localised technological problems that can be solved with the availability of experts at the time of imparting training.

12.8.13 Technology Support to Member Institutions

It is a major challenge for libraries to select appropriate technology from several technological alternatives that are now available in the market place. All libraries invariably require consultation and expert advice in implementation of new technologies.

Open systems and standards are accepted norms to ensure interoperability. Existing library systems, which are generally proprietary systems, may not have the capacity to interface with developing open systems architecture. It is often difficult to balance local library systems development and collaborative solutions with other libraries. Since most traditional library systems use proprietary standards, it is important to work towards finding solutions or developing interfaces that facilitates traditional system to interoperate with other systems, including those provided by commercial service providers. Software and systems capable of providing this interoperability are now available in the market place.

12.8.14 Communication Services Amongst Members

Continuous communication amongst members of a library network is considered its life-line. Effective communication motivates members to cooperate, commit to the cause of a library network and align members toward a shared vision. Continuous communication is necessary to link each member with the practices of the consortium and to involve them at policy and operational level as a team. A library network may promote communication using the following communication media:

Listserv or Mailing List

Listservs are electronic groups for sharing of e-mail message sent to the mailing addresses of a group of people. A listserv or mailing list with archival facility facilitates communication amongst members of a library network.

Maintenance of web site of a library network provides an opportunity to propagate its services and facilities. Of course, it should be updated regularly.

Self Check Exercises

2) What are the various components of a library and information network? Why is human factor most important for functioning of such a network?

3) Mention different types of library and information networks based on their activities and services offered by them.

4) Enumerate five major services and activities of a library and information network.

Note : i) Write your answers in the space given below.

ii) Check your answers with the answers given at the end of this Unit.

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12.9 LIBRARY NETWORKS AT INTERNATIONAL LEVEL

12.9.1 Online Computer Literary Centre (OCLC) (http://www.oclc.org/)

The Online Computer Library Center, Inc. (OCLC), a non-profit corporation, is a membership-based, service and research organization dedicated to the purposes of furthering access to the world's information at reduced cost. The OCLC members are institutions, primarily libraries, which use OCLC products and services to locate, acquire, catalogue, lend and preserve books and other library materials. Researchers, students, faculty, scholars, professional librarians, and other information seekers use OCLC systems through libraries to obtain bibliographic, abstract, citation, and full-text information. The OCLC cataloguing and resource sharing system is the largest and most heavily used computer library system in the world. The OCLC FirstSearch service ranks among the leaders in the online information industry in terms of connect hours. The OCLC bibliographic database, WorldCat (the OCLC Online Union Catalogue), is one of the most consulted electronic databases in higher education.

The OCLC and its member libraries cooperatively produce and maintain WorldCat, the Online Union Catalogue of Books available in the libraries of member institutions. Members of the OCLC can also get access to a wide range of services and databases, including WorldCat The OCLC is the world's largest library network.

History of OCLC

In 1967, the presidents of the colleges and universities in the state of Ohio founded the Ohio College Library Center (OCLC) to develop a computerized system in which the

libraries of Ohio academic institutions could share resources and reduce costs. Its first offices were in the Main Library on the campus of the Ohio State University. Mr. Frederick G. Kilgour, was the first President of OCLC, responsible for the growth of OCLC from a regional library computer system for 54 Ohio colleges into an international network. The objective of the OCLC as stated in its Articles of Incorporation is to "establish, maintain and operate a computerized library network and to promote the evolution of library use, of libraries themselves, and of librarianship, and to provide processes and products for the benefit of library users and libraries...."

In 1977, the OCLC changed its policy that enabled libraries outside Ohio to become members and participate in its governance. The Ohio College Library Center became OCLC, Inc. in 1981, the legal name of the corporation became Online Computer Library Center, Inc.

12.9.1.2 Membership

More than 50,540 libraries in 84 countries and territories around the world are members of OCLC.

Governance

The OCLC's governance structure consists of Members and Governing Members, Members Council and the Board of Trustees. Governing Members of OCLC have the privilege of electing representatives to the Members Council. Any OCLC Member or Governing Member may serve on Members Council, but only Governing Members nominate and determine (by vote) who serves. The Members Council is comprised of 60 delegates plus six international transitional delegates who reflect and articulate the interests of member institutions that participate in OCLC through qualifying regional service providers. Delegates come from many types and sizes of libraries, bringing different perspectives to the Members Council. The 15-member Board of Trustees consists of the President of OCLC and eight trustees elected by the Board itself.

Services

The OCLC offers several products and services, a few of them are described below:

WorldCat

WorldCat is a worldwide union catalogue created and maintained collectively by more than 9,000 member institutions in 84 countries representing hundreds of languages and cultures. With millions of online records built from the bibliographic and ownership information of contributing libraries, it is the largest and most comprehensive database of its kind. WorldCat is the foundation of many OCLC services that facilitates libraries to process, manage and share information resources.

The WorldCat includes catalogue records dating back to thousands of years nearly in every format. Records exist for everything from stone tablets to electronic books, wax recordings to MP3s, DVDs and Web sites. Whether an item is physical or digitally preserved, popular or one-of-a-kind, the integrity of its record is maintained by the input of cataloguing members, OCLC's standards and quality control.

The OCLC offers a number of cataloguing tools such as Connexion, PromptCat and CatExpress to interface with the WorldCat enabling librarians to perform copy or original cataloguing. Built around WorldCat, the OCLC offers a complete range of cataloguing and metadata service including online cataloguing, copy cataloguing, MARC record collections, (online and offline), offline cataloguing and customized OCLC cataloguing.

NetLibrary

The OCLC's NetLibrary platform provides access to electronic books from a wide range of publishers. More than 12,000 libraries worldwide subscribe to NetLibrary. NetLibrary's

growing collection of monographs and reference resources spans hundreds of subject areas and can be accessed through an intuitive, easy-to-use interface that offers a single point of access. Users can find the latest titles, reference sources, business and economics resources, best-selling fiction, and more. NetLibrary also works with the world's leading publishers to provide even more resources, including foreign language collections, databases, journals and audio-books.

The NetLibrary offers detailed usage reports for books subscribed by a library. It is fully integrated into leading library systems allowing libraries to provide direct links to electronic books in NetLibrary.

OCLC's Electronic Collections Online

OCLC's Electronic Collections Online is a powerful electronic journals service that offers web-based access to a growing collection of more than 5,000 titles in a wide range of subject areas from over 70 publishers. It also provides a robust archiving solution and searching across journals. OCLC has secured archival rights to journal content, subscription to e-journals through the OCLC thus it ensures perpetual access to the journals subscribed through OCLC for the paid period of subscription.

OCLC Database Service: FirstSearch

The FirstSearch (FS) is an online service that provides web access to research databases consisting primarily of journal. The service provides seamless electronic access to more than eighty databases containing 10 million full-text and full-image articles in most subject fields. Libraries have an option to select databases based on their needs. Some of the more important databases included in FirstSearch are:

- ABI / INFORM
- Applied Science & Technology Abstracts
- ArticleFirst: index to articles in 12,500 journals
- BasicBIOSIS
- Geobase
- ContentsFirst: tables of contents of 12,500 journals
- Disclosure: financial reports of publicly owned companies
- Education Abstracts: database of articles in education
- Eventline: schedule of conventions, exhibits, etc. , worldwide
- Microcomputer Abstracts: articles in computer applications
- Periodical Abstracts: index to articles in 1500 multidisciplinary journals
- Proceedings: index to conference proceedings
- WorldCat: catalogue of over 32 million book and other library resources
- WorldScope: financial reports on companies world wide.

The size and period covered in FirstSearch varies between the individual databases but many include data going back as far 1980. The FirstSearch facilitates search across multiple databases through its simple menu-driven search interface. Full-image articles from Electronic Collections Online journals are linked to corresponding citations in databases throughout the FirstSearch service. Subscribers to FirstSearch may also place their orders online for articles that are not accessible to them.

Question Point: Cooperative Virtual Reference Service

A collaborative project of the Library of Congress and OCLC, QuestionPoint offers more than 7,000 question-and-answer sets from a database built from reference transactions. Its interface is available in 10 languages, and is used by more than 1,000

libraries in 20 countries. QuestionPoint helps libraries to manage their reference transactions, both online and in-person. Robust administrative tools available through Question Point allow libraries to route questions and manage other reference transactions locally, regionally and nationally. It provides statistical reports to make management decisions, demonstrate trends for funding proposals and measure user satisfaction levels. OCLC's Question Point interface can be added to the library's Web site so as to provide access to quality online reference assistance at any time of day. Users get online help through familiar online channels such as e-mail or a chat window. Question Point assistants can even "share" their solution with a technology that safely and securely gives them remote access to a user's desktop.

Contentdm: Digital Content Management Software

CONTENTdm is comprehensive digital management software. It provides tools to organize, manage, publish and search digital collections on the Web. It is a flexible, multifunction software package that handles all document formats including PDFs, images, video and audio files. CONTENTdm offers a scalable solution that can be upgraded based on user's needs. Its functionality allows a user to create collections quickly and easily using a simple point and click interface.

Inter-Library Loan Management Software: ILLaid

The ILLiad from OCLC is a resource sharing management software that helps libraries to automate routine interlibrary loan functions. The software helps to reduce paperwork dramatically and increases productivity. The software serves as an integrated interface for the library to handle borrowing, lending and document delivery through a single Windows-based interface that includes access to WorldCat and OCLC ILL. The ILLiad automates the processing of interlibrary loan requests, compiles lending and borrowing statistics, provides financial tracking for lending and borrowing and delivers articles and other documents electronically. It even notifies users when requests are fulfilled. Moreover, users can submit and track their own requests via the Web.

Other Services

The OCLC's digitisation, microfilm and archival services are designed to protect and share collections for their members. The OCLC has infrastructure and skilled staff at their preservation centres. The OCLC's collection development services can assess the strengths and gaps of collection available in the libraries if a member institution using their analysis tools.

12.9.2 Research Libraries Group (RLG)-RLIN (www.rlg.org)

The Research Libraries Group (RLG) is a not-for-profit organization consisting of over 150 research libraries, archives, museums, and other cultural memory institutions. The RLG's global membership has remarkable collections for research and learning. Founded in 1974 by the New York Public Library, Columbia University, Harvard University and Yale University, the RLG provides solutions to the challenges presented by information access and management in the digital era.

The RLG supports researchers and learners worldwide by expanding access to research materials held in libraries, archives, and museums. It works with and for its member organizations enhancing their ability to provide research resources. The RLG designs and delivers innovative information discovery services, organizes collaborative programs, and takes an active role in creating and promoting relevant standards and practices. It offers a variety of information resources useful to institutions and individuals.

The RLG is governed and run by its members, staff and board of directors. It is headquarter is in Mountain View, California, USA.

History

In the early 1970s, three US universities and the New York Public Library created a new kind of practical resource-sharing consortium, which was incorporated in 1975 as the Research Libraries Group, Inc. (RLG). Since then, RLG has grown to include virtually every type of cultural memory institutions, i.e., universities, national libraries, archives, historical societies and museums.

Governance

The RLG consists of 150 members which include universities, national libraries, archives, museums, and historical societies, with remarkable collections for research and learning. The RLG provides a framework for collaboration, problem solving and the development of new standards, products and services. The RLG's Board of Directors, elected by the RLG members' designated representatives, is responsible for the strategic management of the activities, property, and affairs of the corporation. The president is the CEO and a voting member of the RLG board. RLG staff, numbering approximately 90, are organized into six departments, namely: General Administration, Member Programs and Initiatives, Integrated Information Services, Technology Development, Customer and Operations Support and Finance and Administration.

Services

Some of the important products and services by the RLG are:

RLG Union Catalogue

This RLG union catalogue is a source of bibliographic information for over 130 million records. It provides unparalleled coverage across subjects and material types in almost 400 languages.

The AMICO Library

The AMICO Library from RLG offers high-quality art images for class projects, art history and studio art programs, course Web sites, lectures, presentations, and research resources. These images are copyright cleared. The database is the Art Museum Image Consortium's multimedia resource of works of art with descriptive material from leading museums.

RLG's Online Databases

RLG's web-accessible databases contain a wealth of information and resources, i.e., traditional library materials, including books, journals, music, and maps, indexes to archival collections, art and rare book auction catalogues, digital images of works of art and cultural artefacts. Some of the online databases offered by RLG are:

- RLG Union Catalogue
- The AMICO Library from RLG
- Anthropological Index and Literature
- RLG Archival Resources
- Avery Index to Architectural Periodicals
- Bibliography of the History of Art
- RLG Cultural Materials
- FRANCIS
- Hand Press Book Database
- Handbook of Latin American Studies
- History of Science, Technology, and Medicine
- Index to Foreign Legal Periodicals

- Index to 19th-Century American Art Periodicals
- Russian Academy of Sciences Bibliographies
- SCIPIO: Art and Rare Book Sales Catalogs

Effective, global resource sharing is central to mission of the RLG. Inter-library loan is made effective under RLG's SHARES Partnership Program using ILL management software.

Technical Services

The RLG offers technical services like:

Copying existing records in local systems at the user workplace. Also, it allows a user to have access to Marcadia Cataloguing. It lets a subscriber put a brief record on an FTP server that need cataloguing along with specific cataloguing requirements.

The RLG have produced a number of guides and tools useful both to members and to the larger community. Most of the tools and guidelines are for metadata creation, digitisation, mark-up languages for archival preservation, microfilming and digital imaging.

12.9.3 Joint Academic Network (JANET) (http://www.ja.net/)

JANET is dedicated to the needs of the UK education and research community. It connects education and research organizations in UK to each other, as well as to the rest of the world through the Internet. In addition, JANET includes a separate network that is available to the community for experimental activities in network development. The JANET connects all universities in UK, FE Colleges, Research Councils, Specialist Colleges and Adult and Community Learning providers. It also provides connections between the Regional Broadband Consortia. The JANET network currently serves over 16 million end-users.

JANET allows videoconferencing and video streaming capabilities to be used to deliver lectures to remote groups of students. For researchers, the high capacity of the JANET backbone allows the linking of large data storage and high performance computing facilities at a national and international level.

Role of UKRENA

UKERNA (United Kingdom Education and Research Networking Association) manages the operation and development of JANET on behalf of JISC (Joint Information Systems Committee) for the UK Further and Higher Education Funding Councils. JISC also works in partnership with the Research Councils. UKERNA is funded by the UK government, with the primary aim of providing and developing a network infrastructure that meets the needs of the education and research communities. The JANET consists of a backbone, known as SuperJANET which , in turn, is linked to Regional Networks. Education and research institutions are connected to the JANET backbone through Regional Networks.

JANET Services

The JANET offers a wide range of network, support and information services to help educational institutions to maximize their benefits from JANET. Major services offered by the JANET includes:

JANET Customer Service (JCS): JCS (JANET Customer Service) is the primary point of contact for enquiries concerning JANET. The JCS is in contact with technical experts and service managers both within UKERNA and throughout the education community, and is, therefore, able to provide relevant assistance at any level. The JCS responds to a large volume of customer queries and facilitates provision of new and upgraded connections to JANET. It also assists in the registration of domain names and applications for IP addresses.

Mail Services: A range of mail services is available, including an electronic mailing list service, a Mailer Shield service, a SPAM-relay Tester System and the Mail Abuse Prevention System. A Web Mail Service is also offered to a limited number of organizations, which do not have the resources to support an e-mail service themselves.

Networking Support Services : Networking Support Services include a co-location service for hosting equipment within the JANET backbone, a Network Time Service offering organizations a stable time reference and a Managed Router Service for those needing expertise in managing their network router.

Usenet News Services : Subscribing organizations with their own news servers can accept a news feed sent from central JANET servers. Organizations without their own news server can let their users read news directly from a JANET server.

Videoconferencing Services :Videoconferencing over IP networks and ISDN (Integrated Services Digital Network) are provided. A Booking Service lets registered users book a videoconference online. The Video Technology Advisory Service evaluates products, develops documentation and offers an on-site consultancy service.

Web Services : A pilot Web Filtering Service is available to provide protection against access to inappropriate content on the Internet and to allow the maintenance of lists of blocked or permitted URLs. Two other pilot services – Web Hosting and Web Mail – are available to small organizations only, such as specialist colleges or adult and community learning centres.

Training : The Training Section was set up initially to provide for the needs of technical staff at sites new to JANET. It has been extended to include education and training for staff charged with the management of networking and networking services at JANET sites with Primary Connections.

Workshops and Conferences : UKERNA ensures that the JANET community is kept up-to-date with networking developments by organizing workshops and conferences to cover either general networking issues or more specific topics. The annual events cover a number of different networking issues, from strategy to technical support. UKERNA also organizes events in conjunction with other organizations.

Other services include Advisory Services, Domain Name Services, Information Dissemination services etc. JANET web site provides further details.

12.9.4 Consortium of University Research Libraries (CURL) (http://www.curl.ac.uk)

The CURL is a Consortium of University Research Libraries in UK. Several activities of CURL are funded by the JISC. The CURL helps member institutions to build distributed and hybrid research library in their institutions with an aim to help researchers all over the world i) to search, locate and request resources of all kinds in different formats, easily and quickly from their desktops; ii) have quick and easy access to an increasing amount of electronic resources, both born-digital and digitized; iii) have physical access to manuscripts, archives or printed items that have not been digitized and cannot be moved, wherever these are held; and iv) have other printed items from outside their own institutions delivered to them efficiently. The CURL's mission is to increase the ability of research libraries to share resources for the benefit of the local, national and international research community.

The total membership of CURL has grown to 28 libraries in UK including 22 university libraries, as well as the British Library, the National Library of Scotland and the National Library of Wales.

Services and Projects

CURL's services and related projects are as below:

Online Databases: The CURL database consists of bibliographic records of documents available in members libraries as well as data from other sources (like Library of Congress). Records are stored in UKMARC and can be accessed via telnet or Z39.50 client. The database is available to non-members of CURL on charged services. The database currently consists of more than 38 million records, which is growing constantly. As libraries progress their retrospective conversion programmes the number of records for older material and for non-book material is increasing. The records are of good quality and CURL has established bibliographic standards for contributors and records are flagged to indicate standard. The service is open to any non-profit organization.

COPAC (http://copac.ac.uk/) : Copac is a union catalogue that provides free access to the merged online catalogues of members of the CURL. There are some 30 million records on Copac representing the merged holdings of 26 CURL member institutions, including the British Library and National Library of Scotland, plus special collections from a small number of non-CURL libraries. The remaining CURL libraries' catalogues are also being loaded. The Copac web site contains service information and support materials. Copac is funded by the JISC.

Archives Hub (http://www.archiveshub.ac.uk/) : The Archives Hub is a collaborative service, which provides a single point of access to descriptions of archive collections held in universities and colleges throughout the United Kingdom. Over 60 institutions are contributing high-quality information to the Hub, which covers over 20,000 archives. The website is free to use and contains information relevant to a wide range of research areas. The service is funded by the Joint Information Systems Committee (JISC) and is overseen by CURL. MIMAS runs the service at the University of Manchester and development work on the Archives Hub software is undertaken by the Cheshire Development Team at the University of Liverpool.

Britain in Print (http://www.britaininprint.net/) : The Britain in Print project, funded by the Heritage Lottery Fund, is a collaborative venture led by Edinburgh University Library involves participation of ten CURL libraries including the Edinburgh Royal College of Physicians and the Mitchell Library in Glasgow. All ten libraries have significant collections of pre-1700 British books which are not yet catalogued in electronic form. Launched in January 2003, the Britain in Print project will provide free access to information about the rich collections of early British books that are held in twenty-one of the nation's most important libraries.

CURL-CoFoR (http://www.cocorees.ac.uk/): CoFoR (Collaboration For Research) is a new CURL initiative, set up to provide its members and other research libraries with practical tools (templates, guidelines and recommendations) for collaborative acquisition and retention. It will also give special attention to techniques for serial de duplication and to the mapping of relationships between research activity and library provision.

12.9.5 China Academic Library and Information System (CALIS)

The China Academic Library and Information System (CALIS), launched in 1998, is a nation-wide resource-sharing system among Chinese academic libraries. Its mission is to serve directly those universities, which are funded by the central government, by providing document and information services to the users through the China Education and Research Network. The CALIS also serves users in other universities and colleges so long as they have network connections to the China Education & Research Network (CERNET). The CALIS is just like a nation-wide academic library consortium in China, half supported by the government, half by the libraries themselves. It can be reached through the web site (http://www.calis.edu.cn/).

Aims and Objectives

CALIS aims to build a national information infrastructure along with CERNET. The priority of CALIS is to reveal what already exists in academic libraries in China and to increase its utilization. Two main tasks of CALIS are to build an information service

network that contains hardware and software; and ii) to introduce and produce various databases.

Governance and Organisation

A top-level committee that consists of officers from related departments of the Ministry of Education and two university presidents from Beida and Tsinghua governs CALIS. An expert team acts as consultants to the committee. CALIS Administrative Centre located at Beijing University coordinate and execute various activities of the network under the leadership of the committee.

CALIS is organized into four national information centres, i.e., Science, Social Science and Humanities Information Centre, Engineering and Technology Information Centre, Medical Information Centre and Agricultural Information Centre. These Centres provides information support to users. Seven regional information centres divided as East China South Regional Center, East China North Regional Center, South China Regional Center, Central China Regional Center, Southwest China Regional Center, Northwest China Regional Center, and Northeast China Regional Center, which provides secondary support for the information users.

Current Status of CALIS

CALIS has established a three-level resource and service infrastructure. Cooperative activities are undertaken in various cities and regions. Currently, CALIS has undertaken six major activities drafted in its plan. These activities include: Coordinative Acquisition, Online Cataloguing, OPAC, ILL, Document Delivery and Internet Navigating.

A number of bibliographic databases and full-text databases are being subscribed / acquired either as central-funded acquisition or consortium acquisition, covering almost all the disciplines and subjects. Some major bibliographic databases and full-text resources include:

- Science Citation Index (SCI)
- Social Science Citation Index (SSCI)
- Engineering Information (EI)
- Biological Abstracts (BA)
- Chemical Abstracts (CA)
- Cambridge Scientific Abstracts (CSA)
- ABI/Global
- ProQuest Academic Research Library
- Science Online
- Elsevier ScienceDirect Onsite
- Academic Press
- IEEE/IEE Electronic Library (IEL)
- Genome Database
- China InfoBank , etc.

Besides, a series of databases were produced in-house. These databases includes:

- Union Catalogues of Books and Journals: 150 members have contributed 1.4 million titles and more than 3 million holdings;
- Current Contents of Chinese Journals: 28 members have contributed more than 2 million abstracts of 5500 Chinese journals;
- Chinese Dissertation and Proceedings Abstract Databases: 85 members have contributed more than 70,000 abstracts;

- Chinese Databases with Unique Features: 23 members have contributed 25 databases which contain more than 450,000 records;
- Navigating Databases for Key Subjects: 45 members have contributed more than 290 disciplines;
- An application platform operated on networks, which are Unicode, Z39.50, ISO10160, and 10161 compliant. The platform includes:
    - online cataloguing server and client, through which librarians can download and upload MARC records and holdings;
    - data-making tools and database servers for TOC and other self-made databases;
    - web-based search engines for accessing self produced databases;
    - software for ILL and desktop document delivery services.

12.9.6 Australian Academic and Research Library Network (AARLN) (http://www.aarlin.edu.au/)

The Australian Academic and Research Library Network (AARLIN) is a strategic framework for cooperation and collaboration developed by CAUL (Council of Australian University Librarians). The AARLIN aims to provide seamless access to Australian and international information resources for researchers via their personal computers through a personally customized portal. The project has funding from the Australian Government. AARLIN commenced in the year 2000 with a pilot project and has developed into a fully operational service in Australian universities.

Twenty of the thirty eight Australian universities and the National Library of Australia are active participants in the project and have contributed funds. The AARLIN project has established cooperative arrangements between the institutions involved for the direction and management of the project. The project is based at La Trobe University where project staff was employed. It is guided by a Steering Committee which includes representatives of CAUL and the Council of Australian University Information Technology Directors (CAUDIT).

Aims

The AARLIN aims to develop a major network infrastructure to support research in Australian universities and other research organizations. Its vision is to develop a national virtual research library and information system that will provide unmediated, personalized and seamless access to the collections of Australian libraries, to research databases and to document delivery services from the work stations of research staff and students. To achieve this vision, the AARLIN project is using portal technology. It is intended that the national portal will have context sensitive and open reference linking software (or openURL) which will permit researchers once authenticated to access a context-sensitive and "standardised" search interface and undertake concurrent searches of electronic databases, web sites, online library catalogues and other electronic information resources.

AARLIN Services

The AARLIN Service model is built around a national portal, which is linked to the local authentication systems of the participating universities. When a user logs on, the portal ensures that the user is an authorized user by communicating with that user's authentication system. At the same time, the authentication service passes to the portal the "user's profile" that includes information such as the subject interests of the user. On the basis of that profile, the portal "pushes" to the user a suite of relevant information resources. Individual users can further refine their access to the relevant resources by adding or deleting individual items from their list of favourite resources.

The portal includes a search engine, which allows parallel searching of a diverse range of databases, information resources and websites using multiple protocols. These protocols include Z39.50, Http, SQL and XML gateways. Consequently, it would be possible for a

user with a single search argument to search across citation and full text databases, online library catalogues, Internet search engines, websites and subject gateways, and to get a uniform search outcome from this parallel search.

Self Check Exercise

5) Describe major developments in library networks at International level?

Note : i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of this Unit.

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12.10 DATA NETWORKS IN INDIA

A brief description of data networks in India is considered important considering the fact that all library networks in India use infrastructure facilities of existing data networks. None of them have their own network infrastructure.

Telecommunication networks work as backbone for a network that is used for accessing, communicating, and transforming information. In India, the Ministry of Communications and Information Technology and Videsh Sanchar Nigam Limited (VSNL), Government of India are responsible for providing and maintaining national and international telecommunication facilities. These communication networks are:

12.10.1 IT Enabled Services (ITES, formerly INDONET)

The ITES (formerly INDONET) was engineered and commissioned as India's first data network in 1986 by the CMC Limited for the computer user community in India. The ITES offers different services integrated in a single delivery mechanism to end-users. It has been used for a number of well-known projects dealing with education, examinations, libraries and electoral cards. It is a powerful Internet service provider focused on providing business-to-business (B2B) eCommerce solutions, specifically in the area of electronic data interchange (EDI).

12.10.2 Education and Research Network (ERNET) (http://www.ernet.in)

ERNET was initiated in 1986 by the Department of Electronics (DoE), with funding support from the Government of India and the United Nations Development Program (UNDP) with an objective to create expertise R&D and education in the country in the area of networking and Internet in the country. The project was initiated with eight premier institutions as participating agencies, i.e., NCST (National Centre for Software Technology) Bombay, IISc (Indian Institute of Science), Bangalore, five IITs (Indian Institutes of Technology) at Delhi, Bombay, Kanpur, Kharagpur and Madras, and the DoE, New Delhi.

ERNET has made a significant contribution to the emergence of networking in the country. It has built up national capabilities in the area of networking, especially in protocol software engineering. It has not only succeeded in building a large network that provides various facilities to the intellectual segment of Indian society—the research and education community, it has over the years become a trendsetter in the field of networking. The

Govt. of India has committed itself to further strengthen the project by including it in the 9th Plan with the allocation of funds and by creation of a new organisational set-up in the form of a Society.

Today ERNET is largest nationwide terrestrial and satellite network with point of presence located at the premiere educational and research institutions in major cities of the country. Focus of ERNET is not limited to just providing connectivity, but to meet the entire needs of the educational and research institutions by hosting and providing relevant information to their users. Research and Development and Training are integral parts of ERNET activities. International connectivity is achieved through gateways at New Delhi, Bombay, Bangalore and Calcutta, with a total capacity of 6.64 Mb. Daily traffic over ERNET exceeds 20 GB.

The ERNET India, in partnership with University Grants Commission is currently setting up UGC-Infonet project to facilitate electronic journal consortium in universities and affiliated colleges. Main Features of the UGC Infonet are:

- scaleable architecture to grow from universities to affiliated Colleges
- nation-wide terrestrial backbone using fiber optic links
- integrated satellite WAN supporting broadband and V SAT technology
- comprehensive network management systems
- linkage with academic and research networks all over the world
- data security and virus protection using firewalls and Intrusion Detection Systems
- data Centres and Mirror Sites Content Hosting.

12.10.3 National Informatics Centre Network (NICNET) (http://home.nic.in/)

The satellite based National Informatics Centre Network (NICNET) was set up to provide informatics services to the Central and State Government Departments and its organizations. The NICNET provides state-of-the-art solutions and decision support for information management and decision support requirements of the Government of India and the corporate sector. The NIC has established a nationwide ICT Network, named NICNET, with gateway nodes at about 53 Central Government Departments, 35 State / UT Secretariats, and in 603 District Collectorates for IT services. The Government has designated the nation-wide Computer-Communication Network, NICNET, as the Government Network.

The organizational set up of NIC encompasses its Headquarters at New Delhi, State Units in all the 28 State capitals and 7 Union Territory Headquarters and District centres in almost all the Districts of India. The Organization employs a large pool of efficient technical manpower. At the NIC Headquarters, a large number of Application Divisions exist which provide total Informatics Support to the Ministries and Departments of the Central Government. NIC computer cells are located in almost all the Ministry of the Central Government and Apex Offices including the Prime Minister's Office, the Rashtrapati Bhawan and the Parliament House.

The NIC has been offering network services over C-band and Ku-band, VSATs, wireless Metropolitan Area Networks (MANs) and Local Area Networks (LANs) with NICNET gateway for Internet resources, to promote economic, social, scientific and technological activities, and also for macro-economic adjustment programmes of the Government. It has been playing the important role of an "active" catalyst and "facilitator" in informatics development programme of the Government enabling them to take policy decisions to create "knowledge societies"— the societies that can exploit knowledge to derive competitive advantage using the opportunities provided by the digital technology.

12.10.4 BSNL's Leased Lines and Datacom (http://www.bsnl.co.in/)

The Bharat Sanchar Nigam Ltd. (BSNL) provides data communication services to its subscribers to transmit data between computer and electronic information devices. It offers a choice of high, medium and low speed leased data circuits as well as dial-up lines. Bandwidth is available on demand in most of the cities. Managed Leased Line Network (MLLN) offers flexibility of providing circuits with speeds of n x 64 Kbps up to 2 Mbps. It is useful for Internet leased lines and international principle Leased Lines services (IPLCs).

For dedicated point-to-point speech, private wire, teleprinter and data circuits are given on lease basis. Leased circuits are provided to subscribers for internal communication between their offices / factories at various sites within a city / town or different cities/town on point-to-point basis, or on a network basis interconnecting the various sites.

12.10.5 INET (http://www.bsnl.co.in/)

INET was commissioned by Department of Telecommunication (DoT) during 1991 and paved way for highly reliable, cost effective and flexible ways of national data transfer and information access.

INET is now managed by Bharat Sanchar Nigam Ltd. Packet switching enables error free transmission with dynamic rerouting of calls and provides interconnection between computers / terminals at different speeds and protocols. In its first phase, INET comprise nodes at New Delhi, Mumbai, Calcutta, Chennai, Bangalore, Hyderabad, Pune, Kanpur and Ahmedabad; and connected through 9.6 kbps and 64 kbps links. In subsequent phases, this facility was extended to 88 other cities throughout the country. Inet is now available in 102 cities in India grouped on the basis of business activity and demand.

12.10.6 SIRNET

The SIRNET (Scientific and Industrial Network), an initiative of NISCAIR (formerly INSDOC) aimed at networking all 40 CSIR laboratories under SIRNET was made operational in December 1989. The SIRNET provided electronic mail facility as its first application service from the SIRNET servers with a mail number of user nodes. For transmitting a message, a user had to deposit message to one of the SIRNET mail service nodes situated at the NISCAIR(earlier INSDOC), Delhi and at its regional centre at Bangalore from where it was transmitted to its destination which may be any of CSIR laboratory presently linked to the mail node. The SIRNET, in turn, was connected to a large network-ERNET (Educational and Research Network) which is connected to the international network UUNET (Unix User Network) through which other international networks like BITNET, CSNET and JANET are accessible. The SIRNET's mail node at the NISCAIR also acted as a gateway to ERNET and through ERNET to other networks. Connections between various laboratories of CSIR was established using dial-up telephone lines, while SIRNET was directly connected to BSNL Mail server. However SIRNET has been presently shelved.

12.10.7 BTISNET (http://www.btisnet.nic.in/)

Recognizing the importance of information technology for pursuing advanced research in modern biology and biotechnology, a bioinformatics programme, envisaged as a distributed database and network organisation, was launched during 1986-87. The programme has become a very successful vehicle for transfer and exchange of information, scientific knowledge, technology packages, and references in the country involving 10-12 thousand scientific personnel. Ten Distributed Information Centres and an Apex Centre at the Department of Biotechnology, and 44 Sub-Distributed Information Centres, located in universities and research institutes of national importance, are fully engaged in this task. Six national facilities have been set up for interactive graphics based molecular modelling and other biocomputational needs.

12.11 LIBRARY AND INFORMATION NETWORKS IN INDIA

Besides facilitating access to vast amount of information services, the library networks have a potential to improve library services in several ways. Libraries and its users get the benefit of accessing online databases, full-text electronic resources and document delivery through resource sharing. The continuous improvement in the networking technologies has reduced the cost of communication, creating new opportunities for the library networks to exploit the technology for greater benefit of the users. In India different library and information networks have been established basically based upon sharing of resources available in particular cities. The development of such networks started with the initiatives of the then NISSAT. The establishment of INFLIBNET by the UGC may be termed as a network at the national level. In Unit 14 of this course we shall discuss in detail some of the existing library networks in India.

12.12 ROLE OF INTERNATIONAL AGENCIES IN DEVELOPMENT OF LIBRARAY NETWORKS

International agencies like IFLA and UNESCO have played a major role in promoting development of library networks especially in developing countries. One of the crucial pre-requisite to the effective functioning of library networks is availability of computer-readable bibliographic records in a standardized format.

12.12.1 Contributions of IFLA

IFLA launched its Universal Bibliographic Control (UBC) programme in 1974. The purpose of the Universal Bibliographic Control was to coordinate activities aimed at the development of systems and standards for bibliographic control at the national level and the international exchange of bibliographic data, including the support for professional activities of appropriate IFLA Sections and Divisions. Although the UBC was concerned with the bibliographic data and not with the exchange of documents themselves, it provided help in standardization of bibliographic records, which is essential for creation of standardized databases and interchange of bibliographic information. The Universal Bibliographic Control and International MARC Core Activity (UBCIM) which was hosted by Die Deutsche Bibliothek since 1990, is closed with effect from March 2003.

The IFLA also launched Universal Availability of Publications (UAP) programme in the year 1976 with an objective of achieve widest availability of published material to the users, wherever and whenever they need it and in the format required. Published materials include not only printed materials, including so-called "grey literature", but audio-visual materials and publications recorded in electronic (digital or analogue) form. To work towards this objective, the programme aimed to improve availability at all levels, from the local to the international, and at all stages, from the publication of new material to the retention of last copies, both by positive action and by the removal of barriers. UAP aimed to ensure that improved access to information on publications is matched by improved access to the publications themselves. The Universal Availability of Publications Core Activity (UAP) and Office for International Lending (OIL), which has been hosted by the British Library at Boston Spa, United Kingdom since the late 1970s, is closed with effect from 31st March 2003.

IFLA and UNIMARC

The original MARC format was developed at the Library of Congress in 1965. Similar work was in progress in the United Kingdom under the BNB MARC Project. These parallel developments led to Anglo-American cooperation on the MARC II project which was initiated in 1968. Despite cooperation several versions of MARC emerged , e.g.

UKMARC, INTERMARC and USMARC, CAN MARC, with certain diversifications aimed to cater to different national cataloguing practices and requirements in their native countries. Since the early 1970s, an extended family of more than 20 MARC formats has grown up. Differences in data content means that editing is required before records can be exchanged.

An international MARC format (UNIMARC) was launched by the IFLA as a solution to the problem of incompatibility. Records in one MARC format could be converted into UNIMARC and then be converted into another MARC format. The intention was that each national agency would need to write only two programs - one to convert into UNIMARC and one to convert from UNIMARC - instead of one program for each other MARC format, e.g. INTERMARC to UKMARC, USMARC to UKMARC, etc.

The International Federation of Library Associations and Institutes (IFLA) published UNIMARC in 1977. The primary purpose of UNIMARC was to facilitate the international exchange of data in machine-readable form between national bibliographic agencies. This was followed by a second edition in 1980 and a UNIMARC Handbook in 1983. All focussed primarily on the cataloguing of monographs and serials and took advantage of international progress towards the standardisation of bibliographic information reflected in the International Standard Bibliographic Descriptions (ISBDs). In the mid-1980s it was seen necessary to expand UNIMARC to cover documents other than monographs and serials. A new description of the format, the UNIMARC Manual, was produced in 1987. By this time UNIMARC had been adopted by several bibliographic agencies as their in-house format. The IFLA International MARC Core Activity is closed with effect from March 2003.

12.12.2 Contributions of UNESCO

The communication and Information Division of UNESCO promotes development of electronic networks, while doing so, it lays emphasis on policies and strategies to develop the most appropriate methodology to meet the specific needs of the different communities of users. UNESCO promotes global and regional networks to catalyze social development, democratization and good governance. UNESCO fosters capacities to acquire new knowledge and skills by providing access to relevant information in an interactive format and in an easily assimilated form. Some of the important networks set-up and promoted by the UNESCO are:

Asia and Pacific Information Network (APIN)

APIN is a network formed by merging the Regional Network for the Exchange of Information and Experiences (ASTINFO), the Regional Informatics Network for Southeast Asia and the Pacific (RINSEAP) and the Regional Informatics Network for South and Central Asia (RINSCA).

APIN is loosely linked with UNESCO's Information for All Programme (IFAP), It promotes ICT literacy and application, information and knowledge networking, sharing of information resources, and use of international standards and best practices in communication, information and informatics.

Information Society Programme for Latin America and the Caribbean (INFOLAC)

INFOLAC was established in 1986 as an inter-governmental forum for the exchange of expertise and experiences for the development of the Information Society in Latin America and the Caribbean, is open to all public, private or professional institutions, through its quarterly journal INFOLAC Newsletter and its website http://infolac.ucol.mx.

INFOLAC's membership is open to all Latin American and Caribbean States, which are members of UNESCO.

Global Network for Education in Journalism (JOURNET)

The Global Network for Education in Journalism and the Media was launched in 1999. As its mission, JOURNET seeks to expand and improve journalism and media practices worldwide through better professional education in this field and to do so by linking educational institutions, training centres, associations, networks and organizations that share the ideals of UNESCO in a Network that will catalyze their cooperation and share information. Taking full advantage of new communication technologies, the network operates principally through electronic databases and interconnections linking the major institutions. The African Council for Communication Education based at the University of Nairobi, Kenya was nominated as the Network Coordinator. The Network implements a programme of activities including training, curricular design and assistance in equipping needy training centres.

Aside from the founding members, the Network membership is open to all journalism schools and institutions that adhere to the basic ideals of freedom of expression and the principles laid down in the statutes.

Orbicom

Orbicom is an international network that links communications leaders from academic, media, corporate and government circles with a view to providing for the exchange of information and the development of shared projects. Orbicom is supported by internationally-based institutions, media, governments and corporations. However, Orbicom's mandate derives from UNESCO's New Communications Strategy unanimously adopted at the 1989 General Conference. This Conference foresaw that new communications technologies would have a significant impact upon the complex processes shaping economies, the environment, social justice, democracy, and peace.

Jointly created in 1994 by UNESCO and Université du Québec à Montréal (UQAM), ORBICOM will ultimately embody a network of 300 associate members and 27 UNESCO Chairs in Communications from around the world.

UNESCO Network of Associated Libraries (UNAL)

UNAL was established in 1990 to promote co-operation among public libraries to build international understanding and to establish contacts between libraries of the North and of the South. UNAL's principal objective is to encourage libraries that are open to the public to undertake activities in UNESCO's fields such as the promotion of human rights and peace, cultural dialogue, protection of the environment, fight against illiteracy, etc. Over 500 libraries around the world are members of the Network.

12.13 SUMMARY

Application of new information technology has brought in dramatic changes in the library and information field. With technological advancement, libraries and information centres around the world have computerized their library routines, developed databases for shared use on computer networks. Besides, improving services and operations for improved performance, libraries have also been able to evolve effective computer networks with an aim to optimise utilization of resources and facilities. The library and information networks have potential to improve library services in several ways. It brings down the cost of information products and services in the network environment in shared mode. It enables libraries to offer need-based services to the end users eliminating the limitation of size, distance and language barriers among them. With evolution in library networks, the emphasis has moved from the networks as physical entities to the resources available through the networks. These network-accessible resources include databases of library holdings, journal articles, electronic text, images, video and audio files, scientific and technical data, etc.

This Unit introduces library networks, their objectives and basic characteristics. It provides definition of library and information networks and identifies human network, online databases, computer hardware and software infrastructure, data networks and members of a library network as its major components. The unit describes physical and economic limitation, literature explosion and increased awareness and demand from the users as basic needs of libraries that led to the growth and development of library networks the world over. It provides a brief history and evolution of library networks.

A library and information network can offer a number of services depending upon its objectives and demand from the member libraries. The unit elaborates on the services that a library can offer to its members with detailed description of the library and information networks and their services at the international and national in India.

The Unit provides a detailed description of the main library and information networks and their services at both the national and the international level. Telecommunication networks work as backbone for a network that is used for accessing, communicating, and transforming information. In India, the Ministry of Communications and Information Technology and Videsh Sanchar Nigam Limited (VSNL) are mainly responsible for providing and maintaining national and international telecommunication facilities. The unit also elaborates on the main communication networks in India. It also covers telecommunication networks in India.

Finally, the Unit also throws a light on the contributions made by the international organizations like IFLA and UNESCO to the growth and development of library networks.

12.14 ANSWERS TO SELF CHECK EXERCISES

1) Role of a library is to meet the information requirement of its members. The use of modern information technology helps the libraries to serve their users in a much better way than before. The library networks help libraries and its user in accessing electronic resources globally. The benefits and by-products of networking include: preparation of union catalogues, library automation, access to databases, optimum use of resources, cooperative acquisition of documents, resource sharing, cost optimisation of library services. Major objective of a library and information network are as follows:

   - Encourage interlibrary cooperation and resource sharing at all level amongst members of the library and information network;
   - Provide help to member institutions in computerisation of their libraries, retro-conversion of bibliographic records and development of standardized databases for shared use;
   - Develop union catalogues of various resources so as to provide reliable access to document collection available in member libraries;
   - Provide effective access to combined holdings of library resources through computerized databases of various member institutions;
   - Provide document delivery services to member libraries;
   - Rationalization of acquisition of information resources in member libraries and optimise their usage through resource sharing;
   - Evolve / adapt protocols and standards, guidelines, methods and procedures for bibliographic records, their storage, inter-library loan, hardware and software;
   - Facilitate communication amongst users of member institutions;
   - Provide training to members of library staff of participating libraries for effective use of libraries in the network;

- Guide member libraries in the effective implementation and utilisation of current and upcoming information technologies;
- Provide access to information resources at reduced rates through consortium arrangements; and
- Develop and promote collaborative digitisation projects.

2) Major components of a library and information network are: human network, online databases, computer hardware and software infrastructure, data networks and members of a library network. The most important component of a library network is the library staff and their willingness to participate and share resources of their respective libraries. While a library network focuses primarily on the availability and delivery of information, it is the human resource that makes it possible. Willing professional librarians and associated professional staff members can work together to produce innovative and far-reaching improvements in library services. Conferences, annual meets, training programmes for members of a library network helps to bring the members together and induces a sense of comradeship amongst them.

3) The library networks can be grouped under the following categories based on their services and activities:

   i) Umbrella or Supermarket

   ii) Bibliographic Utility Networks

   iii) Online Search Service Networks.

   iv) Service Centre Networks /Networks for Subscription to Electronic Resources

4) Five major services and activities of a library and information Networks are as follows:

   - Cooperative Cataloguing;
   - Database Services;
   - Document Delivery Services;
   - Inter Library Loan;
   - Collective Acquisition of Resources;
   - Consortium Purchase.

5) The library networks in USA are at the most advanced level of development. The some of the enabling factors responsible for successful development of library networking in USA includes long tradition of cooperation among libraries, introduction of library automation as early as from 1960's, advances in information science during 1970's and 1980's and introduction of MARC format by the Library of Congress in 1968. The Library of Congress has played a pivotal role that led to the development of successful networks such as OCLC, RLIN and other networks in USA.

   In USA, the OCLC is a non-profit membership organization serving 50,540 libraries in 84 countries and territories around the world. Its mission is to further access to the world's information and reduce library costs by offering services for libraries and their users, and to be the leading global library cooperative, helping libraries serve people by providing economical access to knowledge through innovation and collaboration. Research Library Group (RLG) is another important library network

in USA that is devoted to the mission of "improving access to information that supports research and learning".

In UK, JANET is a network operated and developed by UKERNA under a Service Level Agreement from the Joint Information Systems Committee (JISC) of the UK Higher and Further Education Funding Councils. JANET is connected to the equivalent academic networks in other countries and to many commercial networks in the UK and abroad forming part of the global Internet. Consortium of University research Libraries (CURL) is a library network fully devoted to enhance cooperation amongst university libraries in UK.

There are several other networks that are established the world over, i.e., China Academic Library and Information System (CALIS), Australian Academic network (AARNET), etc. Several other library networks in different countries that are not discussed here.

12.15 KEYWORDS

Bibliographic record : A record containing a structured description of library materials (i.e., book, serial, etc.). Elements generally included are: author(s), title, pagination, publisher, place of publication, and date of publication.

Document Delivery : Document delivery refers to the complete process of supplying a document to its ultimate user, including formulating and issuing the request, as well as managing the physical or electronic delivery of the document.

File Transfer Protocol (FTP) : The protocol used on the Internet for exchanging files

Interlibrary Loan : An arrangement by which a library can make a document that is not in its own collection available to its patron by temporarily acquiring it from a library that does own it.

MARC : MARC refers to a computer record structure; a set of tags and indicators to identify parts of the record; the level of cataloguing information contained in the Library of Congress's MARC records; and the body of records distributed by the Library of Congress MARC Distribution Service.

Network : A structured arrangement of connecting devises such as computer terminals, or libraries, created for the purpose of communications, information exchange, computer and cooperative services.

Catalogue (OPAC) Online Public Acce : OPAC provides access to the library's holdings via a computer monitor, replacing the traditional card catalogue.

Protocol : A protocol is a standardized means of communication among machines across a network. Protocols allow data to be taken apart for faster transmission, and then reassembled at the destination in the correct order. The protocol used determines the way errors are checked, the type of compression, the way the sender indicates the end of the transmission, and the way the receiver indicates that the message has been received. Protocols can describe low-level details of machine-to-machine interfaces (e.g., the order in which bits and bytes are sent across a wire) or high-level exchanges between allocation programs (e.g., the way in which two programs transfer a file across the Internet).

Remote Access : OPAC is an online catalog of a library collection that is available to the public. Today most libraries make their OPAC publicly accessible via the Web.

Resource Sharing : A cooperative arrangement among libraries to make available the resources of a library for use by the patrons of another library, usually through interlibrary loan or reciprocal borrowing.

Retrospective Conversion : The conversion of previously catalogued library materials to machine-readable form. Retrospective conversion is most often undertaken in preparation for installation of a local automated (circulation/catalogue) system or for a cooperative resource-sharing project.

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UNIT 13 BIBLIOGRAPHIC UTILITY NETWORKS

Structure

13.0 Objectives

13.1 Introduction

13.2 Definition

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13.4 Need and Benefits

13.5 How it Works

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13.6 Bibliographic Standards

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13.9 Major Bibliographic Utility Networks

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- 13.9.2 Major Bibliographic Utility Networks in India

13.10 Major Initiatives Related to the Bibliographic Utilities

- 13.10.1 NCCP (National Cooperative Cataloguing Project)
- 13.10.2 Program for Cooperative Cataloguing (PPC)
- 13.10.3 Linked Systems Project (LSP)
- 13.10.4 ARL Retrospective Conversion Project

13.11 Summary

13.12 Answers to Self Check Exercise

13.13 Keywords

13.14 References and Further Reading

13.0 OBJECTIVES

Bibliographic utility networks came into existence with networking of libraries that had converted their catalogues into machine-readable form. With increase in availability of bibliographic data in machine-readable form, the idea of merging these records for creating union catalogue gave birth to standards for formats, bibliographic descriptions, their exchange and controlled vocabulary.

After reading this, you will be able:

- to appreciate the concept ,meaning and the history of Bibliographic Utility Networks;
- to understand its functions and working;
- to have an idea about the tools and standards used for such networks; and
- to know the major existing Bibliographic Utility Networks, functioning at national and international level.

13.1 INTRODUCTION

The idea of a catalogue record as a packet of information, which could be generated and made available centrally for shared use, developed with rapid growth in spread of education and publication explosion in early 19th century.

The growth of bibliographic utility networks could be traced to the growth of bibliographic databases in member libraries. As number of bibliographic databases increased, the creators of these databases started working towards making these databases accessible to users in other libraries to increase inter-library cooperation. This gave birth to the networks of bibliographic databases. The first databases were bibliographic in nature. These databases came into being as libraries converted their catalogues into machine-readable form or existing indexing and abstracting services such as Biological Abstracts, Index Medicus, Chemical Abstracts, etc. started appearing as searchable databases. By 1986, half the databases available through online vendors were bibliographic in nature. However, with passage of time, databases containing textual information, news, statistics, commodity prices, scientific data, etc. were introduced. Soon, a third type of database containing text of full-length documents started appearing. This unit, however, deals with bibliographic utility networks and organisations involved in these activities.

13.2 DEFINITION

The libraries in developed countries do two types of cataloguing, i.e., i) copy cataloguing that involves downloading of a bibliographic records that exist in a centralized database, such as OCLC, and editing it to suite the local requirement; and ii) original cataloguing that involves preparing of a new bibliographic record for documents for which records does not exist in the central database. It may be noted that cataloguing and technical processing are no longer isolated procedures and are tied together, i.e., each bibliographic record in the central database (such as WorldCat from OCLC) have classification numbers from two schemes of classification, i.e., LC and DDC as well as subject headings assigned according to Library of Congress Subject Heading (LCSH). Likewise, most bibliographic utility services offer technically processed bibliographic records.

Automation and computerization have changed traditional methods of cataloguing and technical processing of books and non-book materials especially in libraries in developed countries. Most libraries in developed countries either have centralized technical services or are a part of a cooperative bibliographic utility network. Libraries may also purchase technically processed cataloguing information in the form of printed catalogue card or

machine-readable MARC records from vendors and suppliers. The technical processing of documents is generally automated, centralized, cooperative and is done at a commercial scale. The Library of Congress h supplies bibliographic data to the majority of American libraries.

Bibliographic utilities are online service that facilitates technical processing of documents received in member libraries. A bibliographic utility is an organization that provides access to, and support for, databases and information retrieval systems, either directly to member libraries or through a network of regional service centres, usually via a proprietary interface. These organizations also provide appropriate services and technical support for libraries to receive copies of bibliographic records for books and non-book material in their own collection. The largest bibliographic utilities, such as OCLC, provide a database of cataloguing records created by member libraries. These records are used for copy cataloguing, interlibrary loan, and other functions.

A bibliographic utility network consists of a large union bibliographic database, accessible online to time-sharing members. The network may also provide a variety of other services such as access to other bibliographic databases, full-text resources, etc. OCLC, A-G Canada Ltd., TKM, and AMICUS are example of bibliographic utility network that provide access to bibliographic utilities.

Self Check Exercise

1) What is the difference between a Library and Information Networks and a bibliographic utility network?

Note : i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of this Unit.

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13.3 HISTORY AND EVOLUTION

The Library of Congress (LC) was the first organisation that took up the job of a bibliographic utility service in the year 1901. It started Centralised Catalogue Card Service, which was responsible for production and distribution of catalogue cards for.

The Library of Congress(LC) was the first organisation that took up the job of a bibliographic utility service in the year 1901by providing Centralised Catalogue Card Service for technically-processed documents received in the Library of Congress. The first US National Catalogue Code came out of this service, which, in turn, led to the cooperation with United Kingdom in involving standardised cataloguing practices. The first American Cataloguing Code was published in 1908. In 1950, the British National Bibliography (BNB) was launched. The British Library also began to provide printed catalogue card services at a limited scale. The OCLC (then known as Ohio College Library Center) came into existence in 1970s. The OCLC's shared cataloguing services were brokered through regional groups such as NELINET (New England Library Network), ILLINET (Illinois Library & Information Network), PENLIN (Pennsylvania Library and Information Network) and SOLINET (Southeastern Library Network), etc. At the time when OCLC

developed in USA, other networks grew in Canada, UK and Australia to share cataloguing records. Through out 1980s, other groups developed primarily to promote reciprocal borrowing or collection sharing facilitated by the advent of union catalogues and serials listings.

Historically, the most common form of library cooperation was sharing of union catalogue information, storage facilities, collection development, and sharing of human resources at local, regional and national level. Sharing of union catalogue information, in turn, led to another form of cooperation based on inter-library loan (ILL) where cooperating libraries agree to enter into reciprocal borrowing and use of materials from other libraries.

By 1980s, the shared cataloguing databases had become quite large as a result of retrospective conversion programmes for older books. The central databases began to reflect the collective holdings of the major research libraries the world over.. Also, by this time the cost of information technology, particular, interactive systems, had dropped to the point that it was possible to think about much larger scale applications of information technology. The online public catalogue of individual libraries became available to academic community across nations. The 1980s and early 1990s also saw major investments in resource sharing. Union catalogues and computer-assisted interlibrary loan systems were built to promote sharing of resources. It was possible for user of one library to locate books in other libraries and generate a request to borrow it through inter-library loan. Fax technology was used for the delivery of journal articles to expedite the process.

13.4 NEED AND BENEFITS

The basic purpose of a network is cooperation, coordination and collaboration amongst members for the purpose of sharing information resources. Bibliographic utility networks reduce cost involved in processing of library documents, increase efficiency and save time of experts and users.

Bibliographic utility networks extend access to bibliographic database by pooling catalogue records from different libraries. It results in centralisation and simplification of routines involved in processing of books and non-book materials in a library. Libraries can lower cataloguing costs, increase productivity and improve the services by sharing catalogue records. Bibliographic utility networks facilitate inter-library loan amongst member institutions wherein cooperating libraries agree to enter into reciprocal borrowing and use of materials from other libraries. This form of arrangement enables libraries to borrow books and periodical articles that are not available locally. Fax, postal, courier and electronic mail is used for sending request and for delivery of material.

Shared cataloguing through bibliographic networks facilitates creation of more records, creation of a union catalogue of holdings of member libraries that is made accessible to all participating libraries for use. It results in improvement in quality of records and increases efficiency and facilitates timely availability of records for recent books added to a library. Besides, it allows libraries to make best use of scarce expertise for more fruitful purposes.

13.5 HOW IT WORKS?

The shared cataloguing works on the principal that most books acquired by libraries are common to all libraries, therefore, there is no reason for each library to catalogue the book independently and prepare cards for its card catalogue or a machine-readable bibliographic record for its OPAC every time. A group of libraries, therefore, came together to establish an external organisation that hosted large, centralised databases to facilitate shared cataloguing. OCLC was first such organisation in USA. On receiving a new book, a member library logs-on to the database to search for its record, and if the book is already available in the database, the library simply downloads an electronic copy of the record to its local OPAC and attach its name to the list of libraries holding that book. The member library may also print a card for filing in the library's local card catalogue. In

case, the book is not already in the database, the cataloguer creates a record, which other libraries could use. Shared cataloguing was pioneered by a number of library networks in 1960s and 1970s. Today, these efforts have been consolidated into two major shared cataloguing systems in USA, one operated by OCLC in Columbus, Ohio, and the other by the Research Libraries Group in Palo Alto, California.

13.5.1 Centralised Processing

Centralised processing is a consolidated effort to bring all operations such as acquisition, technical processing (including classification) of books, audio-visuals and other material under one control for a number of libraries. In other words, all processing including classification and cataloguing is done by one agency that is used by others. These libraries may have a common funding agency or may be dealing with same subject interest. The processed books along with processing information in machine- readable form, is sent to various libraries. A central office is responsible for acquisition and processing of materials for all branches / members. In India, there are a few examples where books are procured centrally and distributed to member libraries, most of the time without processing them. Raja Ram Mohan Roy Library, for example purchases and distributes books for several other public libraries in India. Similarly, Delhi Public Library in Delhi purchases and distribute books centrally for all its branches. The erstwhile INSDOC introduced Centralised Acquisition of Periodicals (CAPS) for the libraries of CSIR. However, the service is discontinued now.

13.5.2 Processing Centres

Processing centres are common infrastructural facility or building that is used for carrying out processing of books for a number of libraries. Such centres are developed with cooperation of libraries in adjoining areas. In USA. processing centres are initiated under the provisions of Library Services Act.

Processing centres may be grouped according to the task assigned to them. It may include those that are responsible for i) acquisitions and complete technical processing; ii) ordering, cataloguing, classifying but not physical processing; and iii) cataloguing and classifying only.

Some of the benefits of centralised processing are as follows:

- Centralised processing leads to simplification of routines for member libraries;
- Higher quality of cataloguing can be achieved in a centralised system by employing expert cataloguers which may not be possible for individual libraries;
- Centralised processing results in creation of a union catalogue for all member libraries;
- With combined support of member libraries, it is possible to use more sophisticated tools (bibliographic sources, equipment) so as to achieve better cataloguing and technical processing;
- Centralised processing results in greater level of efficiency due to lower cost and higher volume and staff specialisation; and
- Centralised processing can lead to better bibliographic control.

However, centralised processing has its shortcomings also. The member library has to compromise on practices that are specific to their libraries. Traditional local practices that are followed in member libraries may have to be eliminated for the benefit of all members. Member libraries may have to sacrifice local control and flexibility that is possible when libraries do their own cataloguing and processing. Moreover, the libraries also have to do cost analysis to determine if cost savings is being achieved in the process of centralized processing.

13.5.3 Shared Processing

Cataloguing of bibliographic items done by member libraries that are made accessible to all members of the group. It is called shared cataloguing because responsibility of cataloguing and resultant cataloguing products are shared. Major bibliographic utility networks, like OCLC and RLG, practice shared cataloguing.

13.5.4 Cooperative Processing

Cooperative systems involve independent libraries that agree to cooperate for sharing resources and services. Each library continues to perform technical services on their own using common standards and protocols. Cooperation can involve sharing access to bibliographic utility services, creation of union catalogue (by merging catalogue records from individual libraries), bulk purchases on discounted price, processing and exchange of bibliographic records, etc.

13.5.5 Commercial Processing

The libraries, especially in developed countries, have option to outsource processing of books and non-book materials it acquires. Commercial cataloguing, usually described as centralised processing, is performed and sold by a non-library, for-profit agency. A commercial firm or a jobber supplies bibliographic record in a standardized format to the libraries. These vendors or jobbers may supply catalogue records in MARC / UNIMARC format to the libraries along with books ordered by them through e-mail, on floppies or other storage devices. Some of the vendors also have web interfaces from where subscriber may download the records online. Vendors may also provide retrospective conversion services.

The Library of Congress offered copies of its catalogue cards for sale in 1901 and the H, W. Wilson Company began its card service in 1938. However, today's commercial processing include supply of catalogue record in electronic format in a standardised format and book preparation. Baker and Taylor, Brodart, The Library Corp, Sagebrush Corporation and Marcive, Inc. are some of the important vendors for supplying of bibliographic records in MARC format. M/s D.K. Distributors in India also supply bibliographic records in MARC format along with the book. Most of their customers are foreign libraries. I-Group in Thailand provides MARC records along with the books ordered through them by the libraries.

13.6 BIBLIOGRAPHIC STANDARDS

Bibliographic standards are concerned with the description of contents as well as physical attributes of documents and non-documents in a library. They are generally very complex (MARC has some 700 field definitions) and cover the most difficult and intellectual part of the object definition. These definitions are necessary for processing the material and also for searching it.

Bibliographic standards formats were developed in parallel with the development of computers and other electronic storage devices to facilitate the transfer of bibliographic data between computer systems. Some of the important bibliographic standard formats are:

13.6.1 MARC (Machine-Readable Cataloguing)

MARC is a format standard for the storage and exchange of bibliographic records and related information in machine-readable form. All MARC Standards conform to ISO 2709:1996 Information and documentation — Format for Information Exchange.

13.6.2 USMARC (United States Machine-Readable Cataloguing)

One of several forms of the MARC format developed by the Library of Congress. The USMARC format documents contain the definitions and content designators for the fields that are to be carried in records structured according to Z39.2. The Library of Congress and the National Library of Canada have since harmonized USMARC and CAN/MARC formats to publish a single edition under a new name called MARC 21. MARC 21 is a continuation of both USMARC and CAN/MARC.

13.6.3 UKMARC (United Kingdom MAchine-Readable Cataloguing)

The UKMARC format is the standard developed, managed and promoted by the British Library and applied by the Library in its bibliographic products and services and by many UK libraries in their bibliographic processing operations.

13.6.4 MARC21 (Formerly USMARC and CANMARC)

The MARC21 formats are standard for the representation and communication of bibliographic and related information in machine-readable form. The Library of Congress in consultation with various user communities maintains the MARC21 formats. The British Library has also decided to adopt MARC21 as standard for data creation and processing of its bibliographic records.

13.6.5 UNIMARC (Universal MARC)

The primary purpose of UNIMARC is to facilitate the international exchange of data in machine-readable form between national bibliographic agencies. UNIMARC may also be used as a model for the development of new machine-readable bibliographic formats. The Permanent UNIMARC Committee (PUC) on behalf of IFLA Universal Bibliographic Control and International MARC (UBCIM), which has ultimate responsibility for UNIMARC, represents the interests of users of UNIMARC records. The British Library is an active member of the Permanent UNIMARC Committee.

13.7 TOOLS OF BIBLIOGRAPHIC UTILITY NETWORKS

Bibliographic utility networks requires certain tools to facilitate its members to: i) make use of services offered by it; ii) to increase resource sharing amongst member libraries; and iii) to increase communication amongst member libraries. These tools are as follows:

13.7.1 Union Catalogues

A computerized database of bibliographic records of books available in libraries of members, both for journals and books, is a pre-requisite of a bibliographic utility network. OCLC and RLG, for example, have records and holdings from thousands of institutions in member libraries with an interface that allows member libraries to create records for new books that does not exist in the database or download records for books that already exist in the union catalogue into their library software. Union catalogues are generally developed to support copy cataloguing and resource sharing (ILL) in a geographic area. Union catalogues may specialize on types of documents such as newspapers, serials, books, audio-visuals, etc. Most bibliographic utilities, regional and state networks, and group of individual libraries and their branches have union catalogues and most of other services, like resource sharing, inter-library loan and copy cataloguing, are built around them. Most of the library networks in India, such as INFLIBNET and DELNET, have union catalogues of their member libraries.

13.7.2 Access Tools

Member libraries require access tools and interfaces that facilitate members to interact with databases hosted by the bibliographic utility networks.

Telnet Access to Databases

Bibliographic utility networks may allow telnet access to their databases to the member libraries. Member libraries may require login names and passwords. Telnet allows remote login to host computers. It is used to connect to electronic catalogues and databases at near and distant libraries. Utilising Telnet, an Internet user can establish connections with a bibliographic database and other online services. Since most of the databases now has a web interface, remote login / telnet is not used as often for accessing the databases. Telnet, like most other services, is based on the client / server model. The client program, running on a PC, initiates the connection with a server program, running on a remote machine. Keystrokes are passed from user's terminal directly to the remote computer just as though they were being typed at a terminal on the remote computer. Output from the remote computer is sent back and displayed on user's terminal. Hyper Terminal is a client-end application built into Windows operating system that helps a user to access various servers through Telnet.

Window-Based Access to Databases

Bibliographic utility networks may also provide window-based software that may be used by the member libraries to connect to the bibliographic database hosted by these networks. Research Library Group, for example provides, RLIN21, a Windows-based software that enables libraries to create records directly in the RLG Union Catalogue as well as in the LC/NACO Authority File. Using RLIN21, members can also copy the bibliographic records in their local systems.

Web-Based Access to Databases

Most bibliographic utility networks now offer web-based access to their databases to the member libraries. The member libraries may either be given log-in and passwords to authorize themselves or their access may be IP-enabled on the Campus LAN for member libraries.

The RLG database, for example, can be accessed through its web-based search interface called Eureka, as well as through web-based service called the RedLightGreen. The RedLightGreen (www.redlightgreen.com) is a freely available service specifically designed to meet the research needs of undergraduates.

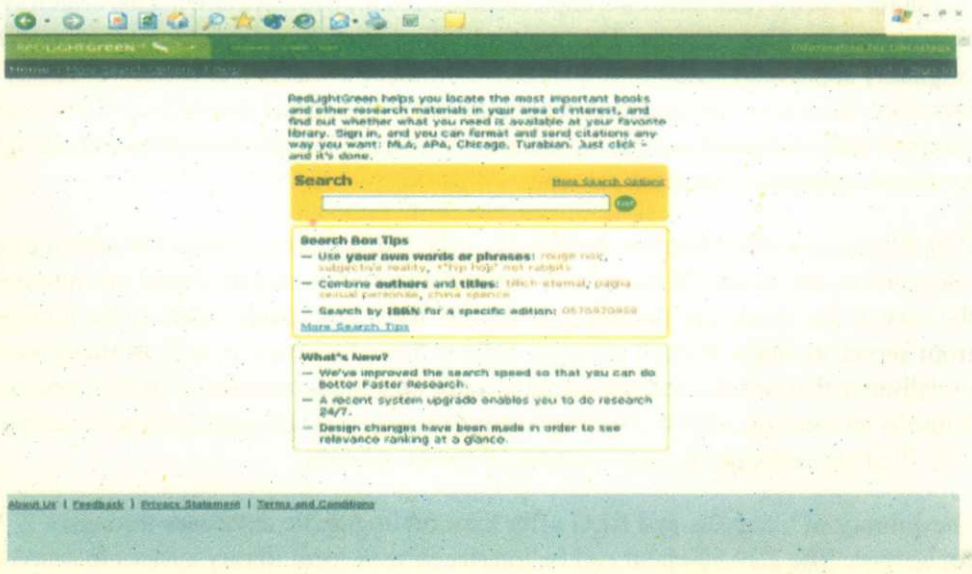


Fig. 13.1: Web-based search interface for RLG database

13.7.3 Tools for Inter-library Loan and Document Delivery

Several bibliographic utility networks have come-up with software solution to automate the process of inter-library loan for member libraries. Research Library Group (RLG), for example, uses ILL management software for inter-library loan under SHARES Partnership Program.

The ILL Manager, used by the RLG members is a Windows-based, state-of-the-art software that eliminates dependence on multiple legacy systems for interlibrary loan, reduces operating costs and streamlines workflows. It handles borrowing and lending transactions with other interlibrary loan systems. It streamlines workflow, automates several routine procedures and increases efficiency.

The OCLC has developed the ILLiad which is a resource sharing management software that helps libraries to automate routine interlibrary loan functions.. The software serves as an integrated interface for the library to handle borrowing, lending and document delivery through a single Windows-based interface that includes access to WorldCat and OCLC ILL. The ILLiad automates the processing of interlibrary loan requests, compiles lending and borrowing statistics, provides financial tracking for lending and borrowing and delivers articles and other documents electronically. It even notifies users when requests are fulfilled. Moreover, users can submit and track their own requests via the Web.

Fully automated comprehensive inter-library loans and document delivery management system like VDX (Virtual Document eXchange) and ARIEL are also available that facilitate resource sharing between libraries and deliver documents directly to users.

13.7.4 Interface for Copy Cataloguing and Online Creation of Bibliographic Records

Bibliographic utility networks not only requires database of holdings of libraries for book and non-book materials but are also required to provide interfaces that support i) search, retrieval and display of retrieve records sorted in order of preference defined by a user; ii) creation of records for books / non-books that does not exist in the union database; and iii) provision to download records from the union database to the local library software used by member libraries. Protocol named Z39.50 is used to develop interfaces both at client end and server end to achieve this. Z39.50 is a national and international (ISO 23950) standard defining a protocol for computer-to-computer information retrieval. Z39.50 makes it possible for a user in one system to search and retrieve information from other computer systems (that have also implemented Z39.50) without knowing the search syntax that is used by other systems. The National Information Standards Organization (NISO) originally approved Z39.50 in 1988. Z39.50 protocol works in a client-server model and, therefore, should be implemented at both the ends. The server should have Z39.50 server installed and configured and the client should have a Z39.50 client installed and configured to access complaint database servers.

Z39.50 allows a client machine to submit a search to a server, manage the search process and retrieve the results of the search. After a search, the search results are retained on the server, the client can request that records from this search result to be transferred from server to client. Z39.50 protocol defines these functions as well as the process of initialisation that permit client and server to agree on various parameters for their interaction. Zebra is an example of Z39.50 server software and PHP, Yaz and ZAP are examples of Z39.50 client software that are available in public domain.

The Library of Congress and RLG offer their bibliographic databases through a Z39.50 connection. The Z39.50 client can be interfaced with local library system to search and retrieve records through RLG and Library of Congress.

2) Mention major landmarks in history and evolution of bibliographic utility networks?

3) Describe how Bibliographic utility networks extend access to bibliographic database?

4) What is the difference between shared processing and cooperative processing?

5) Describe tools required in a bibliographic utility networks.

Note : i) Write your answers in the space given below.

ii) Check your answers with the answers given at the end of this Unit.

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13.8 LIBRARY OF CONGRESS SERVICES

13.8.1 Catalogue Card Service

The first initiative in cooperative cataloguing can be traced back to 1901 when Library of Congress started distributing its cataloguing data to other libraries via sale of printed catalogue cards through its Card Division. The service was viewed as a cooperative endeavour from the beginning. The cooperative element was introduced in 1902 when the Library began to print and distribute catalogue records submitted by other government agencies. By 1909, the exchange of arrangements for catalogue cards had been made with several American libraries. The Card Division developed into Cooperative Cataloguing and Classification Services in 1934 with initiation of a project targeted to increase the amount of bibliographic records for foreign books and non-book materials. The Card Division became the Cataloguing Distribution Service in 1975 to reflect change in product from mostly printed cards to mostly MARC records. Effective from March 1, 1997, the Library of Congress discontinued its MARC catalogue card service, after 95 years of providing catalogue cards to the library community. The Library of Congress, however, maintains a list of alternative commercial suppliers of MARC catalogue cards on its web site.

13.8.2 CIP (Cataloguing-in-Publication)

The Library of Congress pioneered cataloguing-in-publication in 1971, and the British Library followed the suite in 1975. A Cataloguing in Publication record or CIP data, is a bibliographic record, prepared by a national library of a country (or any other central agency) for books that has not yet been published. When the book is published, the publisher includes the CIP data on the copyright page thereby facilitating book processing for libraries and book dealers. The aim of the programme is to provide bibliographic data for new books in advance. It depends heavily on the voluntary cooperation of publishers.

Records are compiled from the information supplied by the publishers on a standard datasheet submitted to the Library of Congress or the British Library Bibliographic Services or national library of respective countries. In the UK, a UK MARC CIP entry appears in the printed British National Bibliography and on the BLAISE Online, and after receipt of the published book in the Copyright Receipt Office an amended entry may appear.

Cataloguing in Publication (CIP) is a voluntary programme of cooperation between publishers and libraries. It enables the cataloguing of books before they are published, and the prompt distribution of this cataloguing information to booksellers and libraries. It enables advance notice of a book's publication to be available to librarians to help them in their book selection process.

In the early days of the programme it was customary for publishers to print the full catalogue record on the verso of the title-page. This is not necessary in several countries now, instead an announcement declaring availability of a computerized catalogue record for the book is printed at the verso of title page to alert the librarians.

13.8.3 MARC Distribution Services

Commenced in 1964, the Library of Congress provides MARC records for materials in hundreds of languages through MARC Distribution Services (MDS) through multiple methods of distribution methods, including Internet FTP, magnetic tapes, cartridge tape drives, etc. It includes national-level cataloguing for almost all English-language imprints. Cataloguing from CONSER and NACO participants and from the U.S. Government Printing Office help make the MARC Distribution Services the premier source for bibliographic records. MARC records are now available in MARC 21 and MARCXML formats.

13.8.4 MARC Alert Service

The MARC Alert Service is a weekly bibliographic subscription service that is tailored to the unique requirements and interests of a subscriber. MARC Alert provides bibliographic records in MARC 21 format for recently published monographs and serials and CIP (Cataloguing-in-Publication) records for soon-to-be-published monographs. A user may select the subjects of his / her interest, when the Library of Congress enters a bibliographic record into its MARC database that matches user's profile, the system automatically generates a matching MARC 21 record, and makes it available to the user in a weekly file via Internet FTP. MARC Alert provides up-to-date bibliographic records for monographs in 2,155 subject categories and 21 broad subject areas. A user can choose topics in a discipline of his / her choice. MARC Alert provides up-to-date bibliographic data for monographs and serial publications in a given field bearing a publication date of the current or prior two years.

13.8.5 Cataloguer's Desktop

Cataloguer's Desktop provides fingertip electronic access to AACR2 and Library of Congress's most heavily used cataloguing publications. With hypertext links, a single click moves a user from one tool to the relevant section of others: Anglo-American Cataloguing Rules (AACR2), Library of Congress Rule Interpretations, Subject Cataloguing Manuals, MARC21 Formats, Latest editions of all MARC code lists and complete list of resources. While using Cataloguer's Desktop a user can look up a rule in AACR2 and then easily consult the LC Rule Interpretation (LCRI). It also features extensive links to the MARC21 format. The most widely used cataloguing documentation resources in an integrated, online system. Cataloguer's Desktop is now available on the Web and on CD-ROM.

13.8.6 Cataloguing Service Bulletin (CSB)

The Library of Congress publishes a quarterly bulletin that contains article on current, new, and revised information about LC cataloguing and classification practices and policies.

13.8.7 National Union Catalogue (NUC)

The Union Catalogue Division of Library of Congress started working of the National Union Catalogue (NUC) project in the year 1909. The union catalogue contain holding data for the collection of the Library of Congress and other participating libraries, several sequences have been printed since 1956 when the first set of 167 volumes covering pre-1942 material was printed. Music, recordings and motion pictures are also included in separate volumes.

13.8.8 National Union Catalogue of Manuscript Collection

It is a large-scale US cooperative project launched to bring together data on some 24,000 manuscripts in over 90 participating libraries and archives, and some 3,000 collections in the Library of Congress.

13.8.9 New Serial Titles

The New Serials Titles published by the Library of Congress since 1950s ceased publication with the completion of the 1999 subscription year. The 1999 cumulation was the last New Serial Titles publication.

13.9 MAJOR BIBLIOGRAPHIC UTILITY NETWORKS

This section will provide information on major bibliographic networks available both at the national as well as international levels.

13.9.1 Major Bibliographic Networks at International Level

Some major bibliographic networks available at the international level are discussed below:

Online Computer Library Center (OCLC) (http://www.oclc.org/)

The Online Computer Library Center, Inc. (OCLC), an non-profit corporation, is a membership-based, service and research organization dedicated to the purposes of furthering access to the world's information at reduced cost. The OCLC members are institutions and primarily libraries, which use OCLC products and services to locate, acquire, catalogue, lend and preserve books and other library materials. Researchers, students, faculty, scholars, professional librarians, and other information seekers use OCLC systems through libraries to obtain bibliographic, abstract, citation, and full-text information. The OCLC cataloguing and resource sharing system is the largest and most heavily used computer library system in the world. The OCLC FirstSearch service ranks among the leaders in the online information industry in terms of connect hours. The OCLC bibliographic database, WorldCat (the OCLC Online Union Catalogue), is one of the most consulted electronic databases in higher education.

Founded in 1967 by the Ohio College Association (a group comprising the presidents of Ohio's private and public colleges and universities), OCLC was originally called the "Ohio College Library Center." Its purpose was to provide shared cataloguing information and related services to 54 Ohio colleges and university libraries. The objective of the OCLC as stated in its Articles of Incorporation is to "establish, maintain and operate a computerized library network and to promote the evolution of library use, of libraries themselves, and of librarianship, and to provide processes and products for the benefit of library users and libraries...."

The OCLC and its member libraries cooperatively produce and maintain WorldCat, the Online Union Catalogue of Books available in the libraries of member institutions of the OCLC. Members of the OCLC can also get access to a wide range of services and

databases, including WorldCat. The OCLC is the world's largest library network. Detailed description on OCLC is available in Block 5, unit 1 on Library and Information Networks.

In 1976, OCLC formed OCLC Pacific to provide training and support to west coast OCLC members. In January of 1999, OCLC Pacific merged with the Western Library Network (WLN) and became the OCLC/WLN Pacific Northwest Service Center, a single service provider for the western United States, now called OCLC Western.

Research Libraries Group (RLG) (http://www.rlg.org/)

The Research Libraries Group (RLG) is a not-for-profit organization consisting of over 150 research libraries, archives, museums, and other cultural memory institutions. The RLG's global membership has remarkable collections for research and learning. Founded in 1974 by the New York Public Library, Columbia University, Harvard University and Yale University, the RLG provides solutions to the challenges presented by information access and management in the digital era.

The RLG supports researchers and learners worldwide by expanding access to research materials held in libraries, archives, and museums. It works with and for its member organizations enhancing their ability to provide research resources. The RLG designs and delivers innovative information discovery services, organizes collaborative programs, and takes an active role in creating and promoting relevant standards and practices. It offers a variety of information resources useful to institutions and individuals.

This RLG union catalogue is a source of bibliographic information for over 130 million records. It provides unparalleled coverage across subjects and material types in almost 400 languages. The truly global reach of the RLG Union Catalogue reflects a unique, long-standing, and evolving collaboration of research collections to pool and share their holdings.

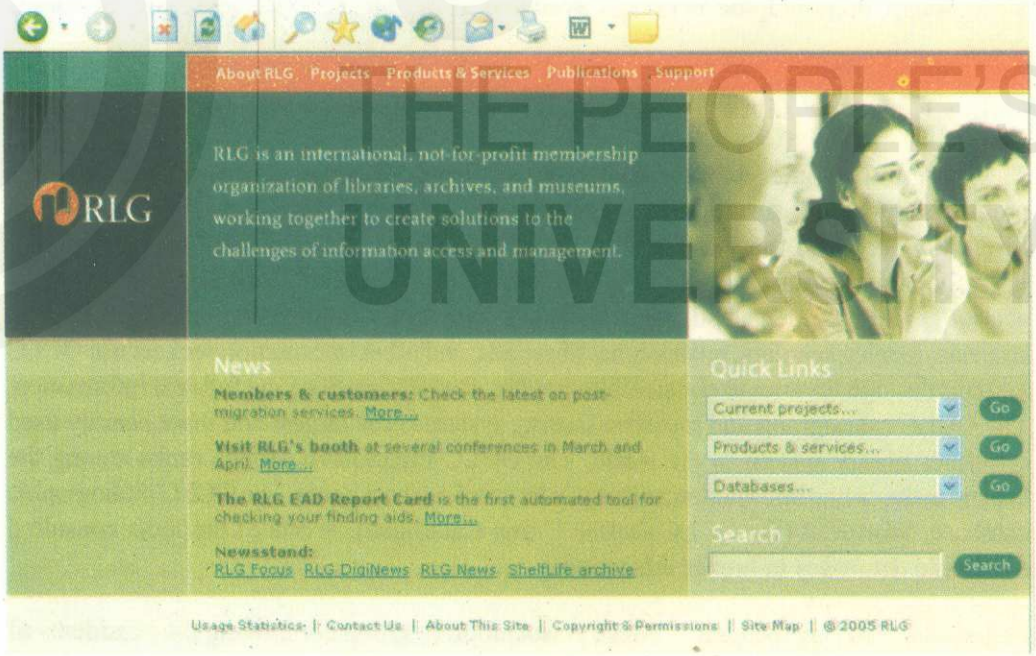


Fig. 13.2: RLG's Web Site

The RLG database can be accessed through its primary search interface called Eureka, RLIN21, a web-based interface to the RLG Union Catalogue, as well as through the RedLightGreen. The RedLightGreen (www.redlightgreen.com) is a freely available service specifically designed to meet the research needs of undergraduates. Based on over 120 million books in the RLG Union Catalogue, the RedLightGreen offers an intuitive search interface that allows students to use their own keywords for searching. Detailed description on RLG is available in Block 5, unit 1 on Library and Information Networks.

British Library National Bibliographic Service (NBS)

The British Library National Bibliographic Service (NBS) distributes the records of the national imprint through the British National Bibliography, which is published in print, as an online database and on CD-ROM. NBS also provides online access to over 17 million bibliographic records in 22 databases, covering printed material from all ages and all cultures. All bibliographic products and services from NBS are designed to be compliant with international bibliographic standards. The BLAISE-LINE databases include catalogues of British Library collections, the Library of Congress catalogue and other major bibliographic files.

Kinetica: Australia's Library Network (http://www.nla.gov.au/kinetica/)

Launched in March 1999, Kinetica extended, the Australian Bibliographic Network (ABN), which was created in 1981 to foster resource sharing by Australian libraries. Kinetica is a modern Internet-based service for Australian libraries and their users. It provides access to the national database of material held in Australian libraries, known as the National Bibliographic Database. A user can search for any item and locate which library in Australia holds it. Gateways to other major library databases are also provided. In addition, Kinetica supports cooperation and resource sharing within the Australian library community through the delivery of MARC records and the provision of a document delivery service.

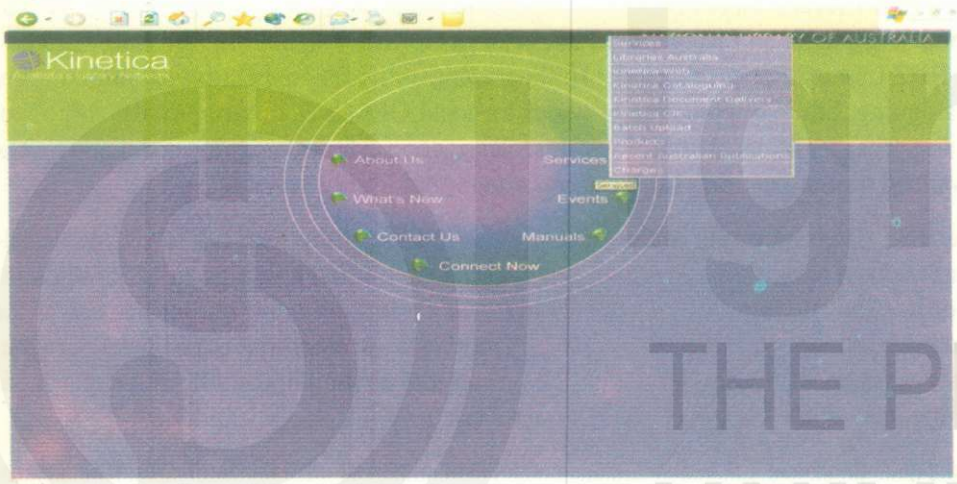


Fig. 13.3: Kinetica: Australia's Library Network

Kinetica Web

The KineticaWeb is one way to search for records in the National Bibliographic Database. It provides access to the Search and Update database and allows the addition of holdings onto the NBD as well as the ability to add simple bibliographic records via Web Input.

Kinetica Cataloguing

Kinetica offers a range of flexible cataloguing options for Australian libraries. Kinetica can be used to add information about collections to the National Bibliographic Database and to obtain records for local catalogues. Records and location information can be added online using special software (the Kinetica Cataloguing client software), through a web form or by sending batches of records to Kinetica for addition electronically. Libraries can also use Kinetica to obtain bibliographic records from all Kinetica databases.

National Library of China (http://www.nlc.gov.cn/english.htm) and The China Academic Library and Information System (CALIS) (http:// www.calis.edu.cn/)

The libraries in China presently have three options for sharing cataloguing resources amongst them, i.e., purchasing bibliographic records from the National Library of China (NLC), joining the China Academic Library and Information System (CALIS) and contributing records to OCLC WorldCat. As a copyright deposit library, the NLC receives almost all new titles published in China at no cost and catalogues then in its own system. Although libraries can purchase NLC catalogued records and download them to their

local library systems, they are not authorized to contribute any bibliographic records or add holdings information to the NLC online catalogue. The NLC catalogue, therefore, is not a union catalogue and contains no holdings information. If users want to locate a book, he / she will have to search catalogues of different libraries.

The China Academic Library and Information System (CALIS), launched in 1998, is a nation-wide resource-sharing system among Chinese academic libraries. Its original goal was to provide centralized cataloguing facility for its member libraries to perform cataloguing activities such as creating, downloading and updating bibliographic records. Member libraries are also encouraged to attach their holdings information to the records that they own. To extend this capabilities, the CALIS is planning to expand its services to include inter-library loan, cooperative acquisitions, and other services. At present, its union catalogue is well established, while its inter-library loan and cooperative acquisitions services are still under development. The CALIS union catalogue is similar to OCLC WorldCat. More than 100 libraries around China are member of CALIS. However, the membership of CALIS is restricted to academic libraries which hinders resource sharing at the national level. Detailed description on CALIS is available in Block 5, unit 1 on Library and Information Networks.

HBZ Library Network (http://www.hbz-nrw.de)

The HBZ Library Network serves academic libraries in the Federal States of North Rhine-Westphalia and Rhineland-Palatinate in Germany since1973. Services offered by the HBZ Library Network include: Bibliographic utility for cooperative cataloguing, copy cataloguing, bibliographic data provider for local OPACs & library portals, Application service provider for local library systems, clearinghouse for cataloguing codes and formats, advanced training courses for librarians and digital library services.

The HBZ database is one of the largest bibliographic utility network in Germany. Their database host more than 12 million title records, 25 million holdings and 25 million item records. The network also offers bibliographic control by name authorities and subject headings. Its member includes more than 50 universities, other academic libraries, regional libraries, special libraries, large public libraries and about 250 institute and departmental libraries are active clients of the HBZ network.

The HBZ database provides access to several external online databases like German National Bibliography, British National Bibliography, Casalini Libri (Italy), Germany's central journals database and other sources via Z39.50 client.

13.9.2 Major Bibliographic Utility Networks in India

India has a number of library networks. These networks include:

- Information and Library Network (INFLIBNET)
- Developing Library Network (DELNET)
- Calcutta Library Network (CALIBNET)
- Ahmedabad Library Network (ADINET)
- Mysore Library Network (MYLIBNET)
- Pune Library Network (PUNENET)
- Madras Library Network (MALIBNET)
- Bombay Library Network (BONET)

Although, most of these networks maintain a union catalogue of books and serials in member libraries, non of them have provision for libraries to do either original cataloguing or copy cataloguing. Union catalogues for most of the networks in India are compiled in an offline mode, i.e., member libraries are asked to supply their bibliographic records that is merged into the database hosted by the networks in their respective headquarters or co-located with one of the ISPs. It can, therefore, said that none of the library networks in India are truly a bibliographic utility network. Detailed description on bibliographic networks mentioned above is already covered in Unit 12 on Library and Information

13.10 MAJOR INITIATIVES RELATED TO THE BIBLIOGRAPHIC UTILITIES

13.10.1 NCCP (National Cooperative Cataloguing Project)

The National Cooperative Cataloguing Project began in late1980s with an aim to improve on the standard model of shared cataloguing in a bibliographic utility by building a national database in which all the records are of high quality that can be accepted into a local database of a library without modification. The programme allowed selected ten libraries to catalogue into a single database into which the records they contribute will be integrated in a consistent manner. The essential features that distinguished "coordinated cataloguing" from "shared cataloguing" was agreement to follow LC procedures and rules interpretations, submission of new names and subjects for inclusion in the national name and subject authority files, operation via LSP, distribution of records in LCs file. Major objectives of the NCCP were:

- to increase the timeliness of cataloguing copy;
- to extend catalogue coverage;
- to reduce duplicative efforts; and
- to produce catalogue of national level quality.

The National Cooperative Cataloguing Project has only nine participants including eight university libraries, i.e., Harvard, Indiana, Yale, Chicago, California at Berkley, Illinois at Urbana-Champaign, Michigan, Texas at Austin and the Library of Congress. Governance of NCCP was LC-centric, because LC was the 'host' database. A number of benefits came from the NCCP, which included the Subject Cataloguing Manual and cataloguing simplification. Besides, the LC also enjoyed measurable benefit by using NCCP cataloguing (43%) to process its own acquisitions at considerable savings.

With successful completion of NCCP, it was decided that a new project be defined without the constraints implicit in NCCP and a model be evolved that takes care of costs and standards, provides training and access to LC and increase the amount of cataloguing available to the nation. The new model must minimize administrative overhead and limit constraints. It must have the technological ability to distribute records and should provide a mechanism for enriching or extending records created by others. The National Cooperative Cataloguing Project (NCCP) ran for over twelve years and superseded by BIBCO.

13.10.2 Program for Cooperative Cataloguing (PCC) (http://www.loc.gov/catdir/pcc/)

The Program for Cooperative Cataloguing, coordinated by the Library of Congress (LC), is an international cooperative effort involving cooperation among several hundred libraries with an aim to create and update cataloguing records jointly. Its aim is:

- expanding access to library collections by providing useful, timely, and cost-effective cataloguing that meets mutually-accepted standards of libraries around the world;
- cooperatively enhance the timely availability of bibliographic and authority records by cataloguing more items, producing cataloguing that is widely available for sharing and use by others, and performing cataloguing in a more cost-effective manner;
- develop and maintain mutually acceptable standards for records;
- promote the values of timely access and cost-effectiveness in cataloguing, and expand the pool of cataloguers who catalogue using the mutually accepted standards;

- increase the sharing and use of foreign bibliographic and authority records; and
- provide for ongoing discussion, planning and operations among participants in order to further the program's mission.

Although the PCC began in 1994, some of its components date back more than 20 years under different names. These are mentioned below:

NACO (Name Authority Cooperative Program)

The NACO program began in 1977. Through this program, participants contribute authority records for names, uniform titles, and series to the national authority file. NACO participants may contribute new name authority records and make changes to existing records within certain parameters. In addition, participants may contribute series and uniform title authority records. An individual institution may join this program, or a group of libraries with a common interest may form a funnel project to contribute records via a coordinator. Participants of the program agree to follow a common set of standards and guidelines when creating or changing authority records in order to maintain the integrity of a large shared authority file. Participants of NACO are required to undergo a training programme either in their home institutions or at the LC. During the training, guidelines are discussed and expanded upon with an ever-growing awareness of the need to streamline cataloguing efforts while building a consistent and predictable file. This file helps the global library community work more efficiently and effectively, allowing it to maximize its resources.

The underlying principle of the NACO authorities project is that participants agree to follow a common set of standards and guidelines when creating or changing authority records in order to maintain the integrity of a large shared authority file.

SACO (Subject Authority Cooperative Program)

The SACO evolved from the Cooperative Subject Cataloguing Project that begun in 1983. The Subject Authority Cooperative Program (SACO) was established to provide a means for libraries to submit subject headings and classification numbers to the Library of Congress via the Program for Cooperative Cataloguing (PCC). The changes in subject heading are proposed for inclusion in Library of Congress Subject Headings (LCSH) and changes in classification number are proposed for inclusion in the Library of Congress Classification (LCC) schedules. To prevent duplication of efforts, participants have access to the online Library of Congress authority files, both for the name authorities and subject authorities, for searching purposes. For training the participants in the program, the SACO workshops are offered by the PCC either in conjunction with library-related meetings or conferences, or as part of the jointly-developed training programme on subject cataloguing workshops. In order to facilitate participation in the SACO programme, instructional materials and forms have been developed that enable a contributor to submit proposals and changes to the Library of Congress.

BIBCO (Bibliographic Cooperative Program)

BIBCO is the bibliographic record component program of the PCC evolved in 1995 from the National Coordinated Cataloguing Programme that began in 1988. BIBCO facilitates participants to contribute monograph records to a central database using mutually agreed upon standards. The PCC BIBCO Project is meant to create new bibliographic records and modify existing bibliographic records in the OCLC database in accordance with national level standards, and code these records in such a way that they will be identifiable to the library community as PCC records. Through this program participants that are already NACO members contribute bibliographic records to the national databases.

The BIBCO members are responsible for contributing full or core level bibliographic records. These records are identified as PCC records and notable for their complete authority work (both descriptive and subject), a national level call number (such as LC classification or NLM classification), and at least one subject access point drawn from nationally recognized thesauri such as LCSH, MeSH, etc., as appropriate.

Participating librarians are required to attend a training session designed specifically for their needs held at their own institution. The course focuses on the core bibliographic record and the values and decision-making skills necessary to cataloguers in producing quality-cataloguing data. Expert staff from PCC libraries provides training. As members of BIBCO, participants contribute bibliographic records for monographs in all formats to the national databases and participate in the development of standards. An individual institution may join this program, or a group of libraries with a common interest may form a funnel project to contribute via a coordinator who will represent the funnel participants.

CONSER (Cooperative Online Serials Program)

CONSER began in 1973 as a project to convert manual serial cataloguing into machine-readable records with an aim to create and maintain high quality bibliographic records for serials. In keeping with its evolution, the name was changed in 1986 from the CONSER (CONversion of SERials) Project to the CONSER (Cooperative ONline SERials) Program. In October 1997, CONSER became a bibliographic component of the Program for Cooperative Cataloguing. The CONSER database resides within the OCLC Online Union Catalogue. CONSER members input, authenticate, and modify serial cataloguing records on OCLC or contribute original records via FTP. The process of authentication involves approving of bibliographic elements in the record and providing for the record's availability through distribution services and bibliographic products.

The members of the CONSER program includes national libraries of the United States and Canada, selected universities, government, research, special, and public libraries; participants in the United States Newspaper Program (USNP), selected library associations and subscription agencies and abstracting and indexing services. The need for CONSER stems from the dynamic nature of serial publications. Unlike most monographs, serials are constantly changing in a variety of ways. Modifications to CONSER records accommodate the changes in the serials themselves and in the rules for their cataloguing. Through the CONSER Program, members are given the authority to modify the master serial records in the OCLC database. To ensure uniformity, the participants agree to follow policies and procedures documented in the CONSER Editing Guide and the CONSER Cataloguing Manual.

13.10.3 Linked Systems Project (LSP)

The Library of Congress with an aim to link together the major bibliographic utilities in the US including Library of Congress initiated the Linked Systems Project (LSP) in 1975. The National Commission on Libraries and Information Science (NCLIS) funded this project for the planning, development and implementation of a nationwide bibliographic utility network. Several independent library networks had emerged and substantial effort were required to allow them to communicate with one another and with the Library of Congress (LC), which was the largest repository of bibliographic data in the U.S. By 1980, Library of Congress, the Research Libraries Information Network (RLIN), and the Western Library Network (WLN) had agreed to form the Linked Systems Project (LSP) to concentrate on developing and implementing the message delivery system. The OCLC joined Linked Systems Project in 1984. While each of these participants had a well-established bibliographic system with record creation, file building and search and response systems that differ significantly with each other, however, each system is based on the data content and content designation found in the MARC record. The LSP communication links became operational in July 1987.

LSP has tried to keep its work in harmony with the international OSI standards. Like OSI, the LSP's Standard Network Interconnection (SNI) protocols are conceived in a seven-layer architecture. In the uppermost or seventh layer, five application-specific protocols exist, i.e., Information Retrieval, Record Transfer, Message Transfer, Test, and Association Control, although only the first two are actually in use.

LSP participants submitted the SNI Information Retrieval protocol to the National Information Standards Organization (NISO) in 1983 for consideration as an American

National Standard. A NISO subcommittee further developed the document, which was finally approved in 1988 as ANSI/NISO Z39.50, Information Retrieval Service Definition and Protocol Specification for Library Applications. Z39.50 is the first standard developed by NISO for library applications within the OSI framework and has formed the basis for international work on similar standards.

The first application of the SNI protocols in LSP has been for the exchange of authorities data using work already begun in LC's NACO (originally the Name Authority Cooperative). The LSP participants made this a priority because NACO provided a viable model on which to build and because the creation of authority records is so costly. The next focus will be on further developing the Records Transfer protocol through the BIBCO.

13.10.4 ARL Retrospective Conversion Project

In the year 1983, the US Council of Library Research funded a project on retro-conversion of bibliographic records where research libraries should participate in a coordinated program to convert research collections in a cooperative mode using subject-based approach with ARL assuming the responsibility of managing the project. During 1985, the ARL undertook the planning study and subsequently initiated a 2-years pilot project to begin implementation of a programme to coordinate systematic conversion of 6 to 7 million bibliographic records for monographs. The key elements of the programme included:

i) **Record Distribution:** Agreements were reached to distribute records to designated projects to LC, OCLC, RLIN and other not-for-profit organizations;

ii) **Cataloguing Standards:** Guidelines addressing authority work and completeness of records were adopted;

iii) **Governance and Coordination:** The ARL governance structure provided policy oversight of the project and a full-time coordinator was hired;

iv) **Determining Subject Projects:** Projects were to be developed based on LC classification and subjects, with institutions' contribution based on collection strength;

v) **Funding Strategies:** Increasing the external funding available for retrospective conversion was a key element of the plan. Unlike current cataloguing, retro-conversion was not already budgeted into the operational budgets for most of the libraries. Given the added costs of coordination and for raising standards and the goal of increasing the level of retro-conversion activity to improve database coverage, additional funding for participating libraries was necessary.

The ARL Recon Project operated through 1987, however, the ARL decided not to continue the staffing support for coordination of project beyond two years pilot project. Although several successful coordinated conversion projects were completed during this period except for long-running series of projects involving Latin American titles. The programme was evaluated as successful, however, it did not attract sufficient fundings, development of the project was slow, the agreement to distribute records was more restrictive than envisaged and record distribution was too slow for effective coordination.

13.11 SUMMARY

Bibliographic utility networks came into existence with networking of libraries that had converted their catalogues into machine-readable form. With increase in availability of bibliographic data in machine-readable form, the idea of merging these records for creating union catalogue gave birth to standards for format, bibliographic descriptions, their exchange and controlled vocabulary. Bibliographic utilities are online service for that facilitates technical processing of documents received in member libraries. A bibliographic utility is an organization that provides access to, and support for, databases and information retrieval systems, either directly to member libraries or through a network of regional service centres, usually via a proprietary interface. These organizations also provide appropriate services and technical support for libraries to receive copies of bibliographic records for

books and non-book material in their own collection. The largest bibliographic utilities, such as OCLC, provide a database of cataloguing records created by member libraries. These records are used for copy cataloguing, interlibrary loan, and other functions.

The Library of Congress (LC) was the first organization that took up the job of a bibliographic utility service in the year 1901. It started Centralized Catalogue Card Service, which was responsible for production and distribution of catalogue cards for technically-processed documents received in the Library of Congress. In 1950, the British National Bibliography (BNB) was launched. The British Library also began to provide printed catalogue card services at a limited scale. The OCLC (then known as Ohio College Library Center) came into existence in 1970s. Through out 1980s, other groups developed primarily to promote reciprocal borrowing or collection sharing facilitated by the advent of union catalogues and serials listings. The most common form of library cooperation was sharing of union catalogue information, storage facilities, collection development, and sharing of human resources at local, regional and national level. Sharing of union catalogue information, in turn, led to another form of cooperation based on inter-library loan (ILL) where cooperating libraries agree to enter into reciprocal borrowing and use of materials from other libraries. By 1980s, the shared cataloguing databases had become quite large as a result of retrospective conversion programs for older books and years of use in cataloguing new acquisitions. The 1980s and early 1990s also saw major investments in resource sharing.

Bibliographic utility networks reduce cost involved in processing of library documents, increase efficiency and saves time of experts and users. The shared cataloguing works on the principal that several books acquired by libraries are common to all libraries, therefore, there is no reason for each library to expend the expert labour to independently catalogue the book and prepare cards for its card catalogue or a bibliographic record for its OPAC. A group of libraries, therefore, came together to establish an external organization that hosted large, centralized databases to facilitate shared cataloguing. OCLC was first such organization in USA.

Bibliographic standards formats are essential pre-requisite to facilitate the transfer of bibliographic data between computer systems.

Bibliographic utility networks requires certain tools to facilitate its members to i) make use of services offered by it; ii) to increase resource sharing amongst member libraries; and iii) to increase communication amongst member libraries. These tools are:

- Union Catalogues;
- Tools that facilitates access to databases developed by the bibliographic utility networks, i.e. Telnet, Window clients, web-based access;
- Software tools that automate the process of Inter-library Loan and Document Delivery;
- Tools for Communication amongst Members; and
- Z39.50 as an information retrieval tool.

13.12 ANSWERS TO SELF CHECK EXERCISES

1) A library and information network consists of libraries and / or information centres that are inter-connected to form a system with an aim to help each other with information needs of their clientele. The members of libraries in a network cooperate through formal agreements and institutional agreements, in order to pooling their resources and to offer better services to the users. On the other hand, a bibliographic utility is an organization that provides access to, and support for, databases and information retrieval systems, either directly to member libraries or through a network of regional service centres. Library networks have broader scope and may include cooperation and sharing of all kinds of resources of all kinds including human, print and electronic resources and physical and infrastructural resources. Whereas

bibliographic utility networks restrict its functioning to processing of documents and their cataloguing. Bibliographic utility may be one of the function of a library and information network.

2) Major landmarks in the evolution and history of bibliographic utility networks are: i) Launching of Centralized Catalogue Card Service by the Library of Congress in 1901 which was responsible for production and distribution of catalogue cards for technical-processed documents received in the Library of Congress; ii) Publishing of the first American Cataloguing Code in 1908; iii) Publication of British National Bibliography (BNB) in1950 along with printing of catalogue card services from British Library; and iv) establishment of OCLC (then known as Ohio College Library Center) in 1970s.

3) Bibliographic utility networks treat a catalogue record as a packet of information, which could be generated and made available centrally for shared use. Shared cataloguing through bibliographic networks facilitates creation of more and more records, creation of a union catalogue of holdings of member libraries which is made accessible to all participating libraries for use. Shared cataloguing results in increased number of records, improvement in quality of records, increases efficiency and facilitates timely availability of records for recent books added to a library.

4) Shared cataloguing refers to system of cataloguing where responsibility for cataloguing and resultant cataloguing product are shared amongst member libraries. Major bibliographic utility networks, like OCLC and RLG, practice shared cataloguing. Cooperative systems involve independent libraries that agree to cooperate for sharing resources and services. Each library, in a cooperative processing system continues to perform technical services on their own using common standards and protocols. Cooperation can involve sharing access bibliographic utility services, creation of union catalogue (by merging catalogue records from individual libraries), bulk purchases on discounted price, processing and exchange of bibliographic records, etc.

5) Tools that are required by a bibliographic utility networks are as follows:

   - **Union Catalogues:** Union catalogues contain bibliographic records of books and non-book material in a number of libraries indicating their location.
   - **Access Tools:** Member libraries require access tools and interfaces that facilitate members to interact with databases hosted by the bibliographic utility networks. These access tools may include: i) Tools for Inter-library Loan and Document Deliver; ii) Tools for communication amongst members, such as listserv / mailing list; iii) Interface for copy cataloguing and online creation of bibliographic records.

Bibliographic utility networks are required to provide interfaces that support a) search, retrieval and display of retrieve records sorted in order of preference defined by a user; b) creation of records for books / non-books that does not exist in the union database; and c) provision to download records from the union database to the local library software used by member libraries. Protocol named Z39.50 is used to develop interfaces both at client end and server end to achieve this.

13.13 KEYWORDS

Copy Cataloguing : Copy cataloguing involves taking original catalogue records that have already been created by other libraries' databases and adopting them for local use, with or without modification, as necessary.

Inter-library Loan : A book or other item lent between libraries.

Listserv : Mailing list program for communicating with other people who have subscribed to the same list. Using e-mail, one can participate in listservs pertaining to any topics of interest. When a user submits a message to the server, the message is relayed to all those on the listserv. The messages are received from other participants via e-mail.

MARC : The MARC formats are standards for the representation and communication of bibliographic and related information (authority, holdings, classification, community information) in machine-readable form. MARC 21 grew out of the harmonization of USMARC and CAN/MARC, formerly national standards, and has emerged as an international standard. MARC21 is an implementation of the American National Standard, Information Interchange Format (ANSI Z39.2) and its international counterpart, Format for Information Exchange (ISO 2709).

OPAC : An automated catalogue system. The catalogue is stored in machine-readable form and accessed online, usually via a networked terminal. OPAC generally provides a variety of additional facilities such as loan information, online reservations and library news.

Retrospective Conversion : The partial or complete conversion of an existing catalogue into machine-readable form, as oppose to records created currently.

UNIMARC : An international MARC format that accepts records created in any of the more than 20 MARC formats, thus facilitating conversion of records among them.

Z39.50 : A NISO (National Information Standards Organization) standard for information retrieval that allows any library using a Z39.50-compliant automated library system to access remote library collections. Z39.50 specifies a query/response protocol between a client and a server.

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UNIT 14 LIBRARY AND INFORMATION NETWORK IN INDIA

Structure

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14.6 Major Library Networks in India

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14.7 Issues Related to Library and Information Networks

14.8 Summary

14.9 Answers to Self Check Exercises

14.10 Keywords

14.11 References and Further Reading

14.0 OBJECTIVES

The objective of this Unit is to discuss the development of library and information networks in India. Though we have been talking about resource sharing and library networking for quit a long time but little has been done. The objectives of the unit is to make students understand:

- concept of Library Network and networking;
- need and Objective of such networks;
- different City and National level networks;
- development of Library network and their role in information communication; and
- future of such networks.

14.1 INTRODUCTION

Due to multi-faceted uncontrolled growth of information and financial constraints none of the library or information centre can claim to be self-sufficient in terms finance and collection. Unaware to the situation, a user wants all relevant documents published in his area of interest. In this situation the only solace libraries has is Union catalogue for

locating documents and Inter Library Loans (ILL). Due to geographical, postal and bureaucratic constraints it takes days or months to get just one document. Revolution of telecommunication technology has opened a new world for library cooperation. Due to recent developments, initiatives are taken at regional and national level to bring libraries together in order to share their collection. Several library and information networks are being created. These networks not only serve towards library cooperation but they also provide variety of services like Internet connectivity, emailing, central repository for data storage and so on. In such Networks, Union Catalogue is transformed to Online Public Access Catalogues (OPACs) and linking of the digital collection with OPAC has led us towards creation of digital libraries. The National Commission on Libraries and Information Science (NCLIS) in its National Programme Document (1975) defines a network as "Two or more libraries and/or other organisations engaged in a common pattern of information exchange, through communications, for some functional purpose. A network usually consists of a formal arrangement whereby materials, information and services provided by a variety of libraries and other organisations are available to all potential users. Libraries may be in different jurisdictions but agree to serve one another on the same basis as each serves its own constituents. Computer and telecommunications may be among the tools used for facilitating communication among them". UNISIST II working document defines it as "A set of inter-related information systems associated with communication facilities, which are cooperating through more or less formal agreements in order to implement information handling operations to offer better services to the users." Thus, a Library Networking is a kind of cooperation among the library. These libraries are connected through telecommunication networks to share documents and services, form consortium, subscribe journals and so on.

14.2 DEVELOPMENT OF INFORMATION NETWORK IN INDIA

It is in mid of 80's that telecommunication boom came to India and networking has been given thrust by the government of India. In India Department of Telecommunication is responsible for maintaining national telecommunication infrastructure which is the backbone for network architecture of country. The major breakthrough was establishment of NICNET by National Informatics Centre (NIC) in 1975. In library parlance NISSAT was a major development. It was established in 1977 under Department of Scientific and Industrial Research (DSIR) with the objective of development of national information systems and service. It played a major role in development of Ahmedabad Library Network (ADINET), Bombay Library Network (BONET), Kolkata Library Network (CALIBNET), Development Library Network (DELNET), Mysore Library Network (MYLIBNET), Bangalore Library Network (BALNET) and Pune Library Network (PUNENET).

Development of INFLIBNET (Information and Library Network) in 1988 facilitated a nation-wide effort to improve information access and transfer, initiated by University Grant Commission (UGC). Besides, there were several networks developed for resource sharing among organizations like SIRNET of Council of Scientific and Industrial Research (CSIR).

Table 1: Chronology of development of networks in India

Year	Network	Supported by
1977	NICNET	NIC
1986	CALIBNET, Kolkata	NISSAT
1988	INFLIBNET	UGC
1992	DELNET, Delhi	NISSAT
1993	ADINET, Ahmedabad	NISSAT
1993	MALIBNET, Chennai	INSDOC
1994	MYLIBNET, Mysore	NISSAT
1995	BALNET, Bangalore	NISSAT

Due to growth of Information Technology (IT) now Internet is being heavily used as communication channel. This has given a chance for these restricted networks to become global networks. Almost all the networks use Internet for dissemination of their service.

14.3 NEED OF LIBRARY AND INFORMATION NETWORKING

None of the library in the world can boast to be self-sufficient in terms of money, manpower and in information coverage. It is very difficult to cope up with these problem unless libraries start sharing the resources they pose, which becomes the root for library Networking.

14.3.1 Information Boom

There is an exponential growth of information. There are lot of researches going on round the globe and accordingly increasing the number of publication. There is always a chance of information going un-noticed. Not only this, now Internet has become a huge source of information. One can find anything over Internet, which has changed the face of publishing. The era is now for Electronic Publishing because it is simple and without time lag. Anyone can publish over Internet. One can also publish in CDROM or DVD with no cost as it used to be with physical medium.

This situation has not only eased the publishing but has also created a good chance for publishing non-relevant material. It is very difficult in such scenario to cull out relevant information for users and keep the quality of library services high.

14.3.2 Rising Price of Resources

Traditionally, libraries store books, journals, reference sources, etc. With decreasing finance and money devaluation it has become extremely difficult for libraries to continue with the purchase of existing sources of information. Unfortunately, much of the journal subscription in Indian libraries is from over sea publishers. Thus, it affect over all library budget. To cope up with problem consortiums could be set up, which is only possible through library network. The price of tools used in the libraries like printers, scanners, digital cameras, etc. is going high day-by-day. Networking libraries facilitates locating work to any other library which has resources and get job done.

On other face of it, the rising price of resources increases the cost of library services. To reduce overall cost service can be partially distributed to other constituents of library network or other alternative can also be sought with their help. The shrinking library budget, and devaluation of rupee and its impact on the library acquisitions can best overcome upon certain level by the following means:

- Use of computer and communication networks for resource sharing;
- Use of national and international databases through communications networks;
- Introduction to full text CD-based systems.

Libraries can do resource sharing in many other areas, such as co-operative acquisition, co-operative cataloguing, co-operative classification, etc. Inter-library loan has been practised as one of the most popular resource sharing activity amongst libraries. Inter-library loan, in a traditional library, is severely affected by barriers of information communication, such as apathy of the lending library, distance, language, time, etc. A computerised inter-library loaning system overcomes these limitations. Thus networked environment facilitates cooperation among the libraries for resource sharing to bring economy in the terms of resources, money and manpower.

14.4 ROLE OF LIBRARY AND INFORMATION NETWORKS

The main objective for establishing library networks is resource sharing. It facilitates cooperative access to library catalogues and documents, cooperative acquisition and avoids wastage of library resource to establish overall economy. Library networks play an important role in propagation of information:

i) Library networking should provide a means for efficient and reliable resource sharing for documentary sources, human resources and consortia based access to journals or databases.

ii) None of the library can be called monetarily self-sufficient so that it can cover all the resource of a subject so there should be a Cooperative effort for collection development to reduces the cost and avoid duplication of subscription.

iii) Library network should facilitate individual or federated searching of participant libraries catalogue as well documents. The central control unit should monitor the network and provide referral services on demand.

iv) Library networks should promote regional, national and international cooperation among various library networks.

v) Library networks should be compliant with global standards like MARC21, CCF (Common Communication Format), ISO 2709, Z39.2, Z39.50, OAI/PMH (Open Archive Initiative Protocol for Metadata Harvesting), etc.

vi) Library network should facilitate further opportunities for creation of new library services, like, Digital libraries, Personalized SDI (Selective Dissemination of Information), etc. It should enhance opportunities for building of new libraries at different levels.

Self Check Exercise

1) Discuss the role played by Library and Information Networks in Information communication?

Note : i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of this Unit.

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14.5 COVERAGE OF NETWORKS

Libraries network is nothing but networking of computers through telecommunication channels among different libraries. These computers store the data and disseminate as and when any request is made by client libraries. The library network may range from within a campus (i.e., network of departmental libraries within a university campus) to

round the globe. Based on the coverage, networks can be classified into three kinds of networks.

14.5.1 Local Area Network (LAN)

When all the participants of library network are situated in a limited geographical location (for example, within a building or campus) it is known as Local Area Network (LAN). In other words, a LAN is a group of computers and associated devices that share a common communications line or wireless link within a small geographic area. A local area network may serve as few as two or three users to thousands of users.

14.5.2 Wide Area Network (WAN)

When all the participating libraries are located in different and far of locations (for example, network of CSIR laboratories in India) it is known as Wide Area Network (WAN). In other words, a WAN is a geographically dispersed telecommunications network for example, DELNET.

14.5.3 Metropolitan Area Network (MAN)

When all the participants of the network are located within a city it is called as Metropolitan Area Network (MAN). MAN is a kind of WAN but often it is referred as in between LAN and WAN. MANs are very common within city limits that is why they are called as Metropolitan Area Network. A MAN can have several interconnected LANs. CALIBNET, ADINET, etc. are Metropolitan Area Networks.

Self Check Exercise

2) Discuss different types of Library Networks?

Note : i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of this Unit.

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14.6 MAJOR LIBRARY NETWORKS IN INDIA

There are several library initiatives in India but not many of them are active. The most active are DELNET, INFLIBNET, CALIBNET, MYLIBNET, etc.

14.6.1 Information and Library Network (INFLIBNET)

INFLIBNET is helping in automation and modernization of university library system. It is providing universities high-speed line for accessing e-journals. It has become a major player in enhancing scholarly communication in India. INFLIBNET development was started under University Grant Commission (UGC) India in 1991. Initially it was started as a project under Inter-University Centre for Astronomy and Astrophysics (IUCAA). The headquarter of INFLIBNET is situated in Ahmedabad, Gujarat.

Objectives

Information and Library Network (INFLIBNET) is a major programme of the University Grants Commission (UGC) initiated in 1991 with its Headquarters located at Gujarat University Campus, Ahmedabad. The Programme is directed towards modernization of libraries and information centres, and establishment of a mechanism for information transfer and access, to support scholarship, learning and academic pursuits. INFLIBNET was established with following objectives:

- To promote and establish communication facilities to improve capability in information transfer and access, that provide support to scholarship, learning, research and academic pursuit through cooperation and involvement of agencies concerned.
- To establish (INFLIBNET : Information and Library Network) a computer communication network for linking libraries and information centres in universities, deemed to be universities, colleges, UGC information centres, institutions of national importance and R&D institutions, etc. avoiding duplication of efforts.

Over the years, the Programme has progressed well. Beginning May 1996, the INFLIBNET is recognized as an independent autonomous Inter-University Centre under UGC to co-ordinate and implement nationwide high-speed data network using state-of-the-art technologies for connecting all the university libraries in the country. INFLIBNET is set out to be a major player in promoting scholarly communication among academicians and researchers in India.

14.6.1.1 Functions

In order to fulfill the broad objectives listed above, the, INFLIBNET performs the following functions:

- Promote and implement computerisation of operations and services in the libraries and information centres of the country following a uniform standard.
- Evolve standards and uniform guidelines in techniques, methods, procedures, computer hardware and software, services and promote their adoption in actual practice by all libraries, in order to facilitate pooling, sharing and exchange of information towards optimal use of resources and facilities.
- Evolve a national network interconnecting various libraries and information centres in the country and to improve capability in information handling and service.
- Provide reliable access to document collection of libraries by creating on-line union catalogue of serials, theses / dissertations, books, monographs and non-book materials (manuscripts, audio-visuals, computer data, multimedia, etc.) in various libraries in India.
- Provide access to bibliographic information sources with citations, abstracts, etc. through indigenously created databases of the Sectoral Information Centres of NISSAT, UGC Information Centres, City Networks and such others and by establishing gateways for on-line accessing of national and international databases held by national and international information networks and centres respectively.
- Develop new methods and techniques for archival of valuable information available as manuscripts and information documents in different Indian Languages, in the form of digital images using high-density storage media.
- Optimise information resource utilization through shared cataloguing, inter-library loan service, catalogue production, collection development and thus avoiding duplication in acquisition to the extent possible.
- Enable the users dispersed all over the country, irrespective of location and distance, to have access to information regarding serials, theses/dissertations, books, monographs and non-book materials by locating the sources wherefrom available

and to obtain it through the facilities of INFLIBNET and union catalogue of documents.

- Create databases of projects, institutions, specialists, etc. for providing on-line information service.
- Encourage co-operation among libraries, documentation centres and information centres in the country, so that the resources can be pooled for the benefit of helping the weaker resource centres by stronger ones.
- Train and develop human resources in the field of computerised library operations and networking to establish, manage and sustain INFLIBNET.
- Facilitate academic communication amongst scientists, engineers, social scientists, academics, faculties, researchers and students through electronic mail, file transfer, computer/audio/video conferencing, etc.
- Undertake system design and studies in the field of communications, computer networking, information handling and data management.
- Establish appropriate control and monitoring system for the communication network and organise maintenance.
- Collaborate with institutions, libraries, information centres and other organisations in India and abroad in the field relevant to the objectives of the Centre.
- Create and promote R&D and other facilities and technical positions for realising the objectives of the Centre.
- Generate revenue by providing consultancies and information services.
- Do all other such things as may be necessary, incidental or conducive to the attainment of all or any of the above objectives.

14.6.1.2 Services

In order to support the above mentioned objectives INFLIBNET promotes following activities:

Library Automation: INFLIBNET is providing grants to university libraries for automating the library activities. Automation is first step towards creating network of libraries. So far, 123 libraries have been given the grant for building infrastructure and automation. INFLIBNET through UGC is providing the support in phases. Not only for creating infrastructure, INFLIBNET is financially supporting the project for another five years. INFLIBNET has developed a library automation package called SOUL (Software for University Libraries). SOUL works in client server environment. Currently, SOUL is developed on Windows platform but efforts are being made to port on Linux platform. It has all the necessary modules which a library needs.

Software Development: Besides SOUL, INFLIBNET has developed several small utilities for day-to-day libraries operations. It also develops solution on demand by university libraries, like retro conversion, preparation of catalogue cards, duplicate checking of library records and so on.

Union Databases: It has created 8 Union databases which are continuously being updated and appended for

- Books,
- Theses,
- Serial holdings,
- Current serials,
- Experts,

- Research projects,
- Secondary serials/CD-ROMs, and
- DDC serials.

Online access to these databases are given through web interface. Besides, INFLIBNET has developed a system called SEWAK which automatically processes offline queries sent through email. Mail with request should be sent to *sewak@mail.inflibnet.ac.in.*

Databases: INFLIBNET subscribes several databases in CDROMs. It provides database search service for researchers of universities free of cost. Following databases are subscribed by INFLIBNET:

- Current Content on Diskette: Social and behavioral Sciences;
- Dissertation Abstracts International: Humanities & Social Sciences;
- EconLit: Economic Literature;
- EMBASE Drugs & Pharmacology CD;
- ERIC: Education and Research Centre;
- IICD: Inside Information;
- Inside Science;
- Inside Social Science;
- ISSN Compact: The ISSN register on CD-ROM;
- LISA: Library and Information Science Abstract;
- NUCSSI: National Union Catalogue of Scientific Serials in India;
- Philosopher's Index;
- PsycLit: Psychological Literature;
- SSCI: Social Science Citation Index;
- Sociofile: Sociological Abstracts;
- Ulrich's On Disc: International Periodicals Directory.

INFLIBNET also provides a facility to search OCLC's FirstSearch service. This service covers 85 journals. The service is given in offline mode that means one needs to send a request (as email or post) for literature search to INFLIBNET and search will be done at INFLIBNET and results will be sent to requester.

Human Resource Development: INFLIBNET runs several short-term courses for university staffs in order to train them with new automated tools and techniques.

***One month Short Term Training Programme*:** It has conducted many programs for working university library professionals. The course contains training module in computer application for library and information centres.

On-site Training: INFLIBNET staff conduct on-site short training programs. It also conducts customized programs to orient library staff towards library automation particularly SOUL.

Document Delivery Service: INFLIBNET has established 6 centres as Document Delivery Centre (DDC). This service is given on 'No profit No loss' basis. A union catalogue of Serial Holdings, Secondary Serials and Current Serials is kept in each university library. Same can be searched online as well. Any one can contact these libraries and request for the document. Request can be made by email, fax, telephone, post or even in person. Photocopy or electronic form of document is sent to the requester on nominal payment basis. The 6 centres are :

- Banaras Hindu University, Varanasi
- University of Hyderabad, Hyderabad
- Indian Institute of Science, Bangalore
- Jawaharlal Nehru University, New Delhi
- Punjab University, Chandigarh
- Tata Institute of Social Science, Mumbai

Current Awareness Service: The Contents of Periodicals in Science and Technology (COPSAT) is a current awareness service provided by INFLIBNET in collaboration with National Centre for Science Information (NCSI), Indian Institute of Science, Bangalore. It covers more than 4000 journals in the area of life sciences, physical sciences, chemical and earth sciences, engineering, computing technology, agricultural and environmental sciences.

14.6.1.3 UGC-INFONET

UGC-INFONET E-Journals Consortium has been set up by the University Grants Commission (UGC) to promote the use of electronic databases and full text access to journals by the Research and academic community in the country. The UGC-Infonet project is executed in collaboration with ERNET. With the initiatives university campuses are being modernized with the state of the art campus-wide networks. The UGC is setting up its own communication network, called, UGC-Infonet. A Joint Technical and Tariff Committee (JCTC) is the nodal agency for coordination of the UGC-Infonet and facilitates linkage between ERNET and the universities. UGC supports the cost on behalf of participating universities; INFLIBNET Centre. The consortium covers all the disciplines like Pure Sciences, Social Sciences and Humanities including Management and Languages.

UGC-INFONET was formally inaugurated by the Hon'ble Prime Minister on 28th December, 2002.

14.6.1.4 Conference and Workshops

INFLIBNET conducts an annual event called Convention on Automation of Libraries in Education and Research Institutions (CALIBER) on different places in India. The topics covered in conference are recent and related to library automation.

INFLIBNET also supports workshops all over India which are related to library automation and digital libraries. Currently, INFLIBNET is supporting a series of workshops on Dspace (Digital library software) in collaboration with Documentation Research and Training Centre, Bangalore.

INFLIBNET is playing a major role in modernisation of university libraries. It is supporting creation for infra-structure by providing financial support besides it is running several courses as well as conducting workshops for training of library professionals.

14.6.1.5 UGC's E-Journals Consortium

The UGC's E-Journals Consortium aims at providing online access to electronic journals and databases in all disciplines to the universities in India. All universities which comes under the purview of UGC will be beneficiary members of the programme. The scheme would be gradually extended to colleges as well. The programme is being executed by Information and Library Network (INFLIBNET) Centre, Ahmedabad, Access to various electronic resources have formally commenced from January 1, 2004, initially for 50 universities and has been extended to 100 universities with effect from January, 2005.

The programme aims at increasing accessibility of electronic resources to the universities. It will go a long way in mitigating the severe shortage of periodicals faced by university libraries for several years. The E-Journals programme is a cornerstone of the UGC-INFONET effort, which aims at addressing the teaching, learning, research, connectivity

and governance requirements of the universities. The E-Journals programme demonstrates how communication networks and computers can be used to stretch and leverage available funds in furthering these aims. A bouquet of e-journals were presented to the nation by His Excellency the President of India Dr. A P J Abdul Kalam on 28th December 2003 during the concluding day of UGC's Golden Jubilee Celebrations.

Self Check Exercise

3) Describe role of INFLIBNET in library automation?

Note : i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of this Unit.

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14.6.2 Developing Library Network (DELNET)

DELNET has been sponsored by the National Information System for Science and Technology (NISSAT), Department of Scientific and Industrial Research, Government of India and is currently being promoted by the National Informatics Centre, Department of Information Technology, Ministry of Communications and Information Technology, Government of India and India International Centre, New Delhi. Though it became a registered body in 1992 but was functional since 1988. DELNET was originally established as Delhi Library Network and subsequently the name was changed to Developing Library Network. The Headquarter of DELNET is in New Delhi.

14.6.2.1 Objectives

DELNET is fully functional with following objectives -

- To promote sharing of resources among the libraries by developing a network of libraries, by collecting, storing and disseminating information and by offering computerised services to the users.
- To undertake scientific research in the area of Information Science and Technology, create new systems in the field, apply the results of research and publish them.
- To offer technical guidance to the member-libraries on collecting, storing, sharing and disseminating information.
- To coordinate efforts for suitable collection development and reduce unnecessary duplication wherever possible.
- To establish /facilitate the establishment of referral and /or research centres, and maintain a central online union catalogue of books, serials and non-book materials of all the participating libraries.
- To facilitate and promote delivery of documents manually or mechanically.
- To develop specialised bibliographic database of books, serials and non-book materials.
- To develop databases of projects, specialists and institutions.

- To possess and maintain electronic and mechanical equipment for speedy communication of information and delivery of electronic mail.
- To coordinate with other regional, national and international networks and libraries for exchange of information and documents.

Currently, DELNET has about 800 members from India and 12 members from abroad including Nepal, Oman, Philippines, Sri Lanka, United Arab Emirates and United States.

14.6.2.2 Services

DELNET promotes the following activities –

Online Databases: DELNET provides online access to several databases to member libraries and information centres.

- Union Catalogue of Books in Common Communication Format (CCF)
- Union List of Current Periodicals: in science and technology, social sciences and humanities
- Union Catalogue of Periodicals
- Database of Periodical Articles
- Indian Specialists: A Who's Who: For eminent scientists, educationists and writers from all over the country
- CD-ROM Database
- Union List of Video Recordings
- Union List of Sound Recordings
- Union List of Newspapers
- Union List of Serials: Management Libraries
- Union List of Serials: Petroleum and Natural Gas
- Union Catalogue of Hindi Books
- Multilingual Books: Sample Database
- Urdu Manuscripts Database
- Database of Theses and Dissertations

Inter Library Loan Online: Member libraries can request online for a document using inter-library loan facility of DELNET through DELNET server and the document is couriered to the requesting library. The member library needs to pay an annual subscription for this service.

Retro-Conversion and Creation and Maintenance of Bibliographic Databases: DELNET entertains requests for retro conversion from one MARC standard to other on demand. DELNET also entertains requests for creation of bibliographic databases for member libraries so that they can create their own OPAC. It provides Document Delivery Services to its users and maintains a referral centre which provides reference service to members.

Training Programmes: DELNET organizes monthly training program with NIC on topics like Web page design, Internet search strategies and other resources, etc. It also conducts courses on Machine Readable Cataloguing and bibliographic standards like MARC21.

Conferences, Lectures and Workshops: National Convention on Library and Information Networking (NACLIN) in an annual conference by DELNET which is organised at different parts of country. Besides DELNET regularly organises workshops lectures in different parts of country and abroad.

Newsletter: DELNET publishes newsletter called 'DELNET Newsletter' in communicate the activity of DELNET to professionals.

Internet, Electronic Mail and Videoconferencing: DELNET provides E-mail facility through National Informatics Centre (NIC). It also provides Internet Connectivity to its member-libraries in Delhi through NIC.

DELNET is providing value added service to its member libraries. It is deeply involved in the development and promotion of automated services. DELNET is also working towards propagating the concept of creation of digital libraries and multilingual access to information.

Self Check Exercise

4) Describe different services offered by DELNET.

Note : i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of this Unit.

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14.6.3 Calcutta Library Network (CALIBNET)

The CALIBNET was envisaged as a metropolitan network in 1993, linking 38 libraries in Calcutta with financial support from NISSAT. The prime objective was to institute systematic interlibrary co-operation and document delivery among the networked libraries for effective resource sharing. The applications to be supported are electronic mail, file transfer, remote logging to databases and document access. The participating libraries computerised their in-house functions such as cataloguing, serials control, acquisition and fund accounting, circulation and user services. These have been interconnected through X.25 protocol. The Network Services Centre provides global information services for all the users of the participating libraries. The services include current awareness, union catalogues, database, access to national and international networks.

CALIBNET provides libraries and their members an efficient solution for their information needs. The project was supported by NISSAT in 1986 and managed by the CALIBNET Society established under the West Bengal Government's Societies Registration Act 1961. The centre is stationed at Jadavpur University Campus, Kolkata.

14.6.3.1 Objectives

CALIBNET is established to pursue the problems of eastern region of country, mainly West Bengal. The primary objective of the organisation is creating and facilitating access to available library and information resources in West Bengal. The main objective is supported by other objectives like given below :

- Facilitating remote online access to the holding data of Calcutta libraries and other specialised databases; and
- Providing electronic access to globally available information, imbibing its information centre approach.

14.6.3.2 Services

CALIBNET provides the following services:

Software Developed: By intense in-house research and development two software have been developed for supporting library activities:

Sanjukta: This in-house software has been developed for storage and retrieval which is used in Centralised Database of CALIBNET for providing online access from remote locations. The software provides options and flexibility for record generation, organizing and searching information.

Parapar: Parapar has been developed to support interchange of bibliographic data between different bibliographic standards like, USMARC, UNIMARC and CCF. It converts other format data to ISO-2709 format which can be imported into the centralized Database of CALIBNET.

Current Content Service: Confile Service: Confile is a current content service. It covers almost 20,000 journals of different disciplines. It economizes library service on journal subscription and reduces the drain on precious foreign exchange resources.

Document Delivery Service: Caliborder: Caliborder is a document delivery service which delivers full text of any article and even patents on demand.

Selective Dissemination of Information: ConAlert: ConAlert service is designed to give current and tailored bibliographic information. A user profile is created based on the keywords. Notification about the arrival or availability of the document is sent to the user. On demand document is also delivered at user's desk.

Institutional Resources Development Services: CALIBNET supports institutes to build library. It also assists and provides consultancy in library automation and creation of databases and electronic resources. It runs wide range of training programs and customized courses based on institutional needs.

Databases: CALIBNET maintains a centralized database of holding of Kolkata libraries. It also maintains database of Asiatic Society Journals, and current serials acquired by Kolkata Libraries. Through website, CALIBNET also provides links to;

- Overseas Library Resources on India;
- Worldwide Library Catalogues;
- National Libraries of the World.

CALIBNET is an active library network in West Bengal. It is running few of its services through website http://www.calibnet.org.

Self Check Exercise

5) Describe services offered by CALIBNET?

Note : i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of this Unit.

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14.6.4 Ahmedabad Library Network (ADINET)

ADINET is established for developing cooperative mode of working amongst the libraries and information centres in and around Ahmedabad. It was established in 1994 with the help of NISSAT. ADINET promotes sharing of resources and disseminates information

among member libraries by networking them up. It is stationed in INFIBNET Centre, Ahmedabad.

14.6.4.1 Objectives

ADITNET is established with following objectives:

- To bring about cooperative mode of working amongst libraries and information centres in and around Ahmedabad;
- To integrate the economic, scientific and technical information systems into an effective network in and around Ahmedabad;
- To facilitate and promote sharing of resources amongst the libraries and information centres in and around Ahmedabad by developing and maintaining a central on-line Union Catalogue containing bibliographic information on books, serials and non-book materials of all the participating libraries;
- To coordinate with other regional, national and international networks, libraries, information and documentation centres for exchange of information and documents;
- To offer technical guidance to member libraries on selecting, storing, sharing and disseminating information;
- To coordinate efforts for suitable collection development and reduce unnecessary duplication whenever possible;
- To develop databases of projects, specialists and institutions in and around Ahmedabad;
- To create awareness amongst all users' groups and to educate them in the utilisation of information;
- To develop resources and to propagate information in ways appropriate to the needs of users in and around Ahmedabad; and
- To help library and information centre users and also individuals who practice different professions in getting specialized information of their interest.

14.6.4.2 Services

Following services are available with ADINET:

Databases :ADINET acts as referral centre and maintains a database of all the databases available in different libraries in and around Ahmedabad. It also has a database of current periodicals of over 100 libraries. ADINET has also a database of qualified librarians who are working in Gujarat through its website.

Document Delivery and Inter Library Loan: ADINET acts as referral centre for finding any periodical, book, report, theses and non-book material like audio-video materials, etc. It facilitates inter library loaning among the libraries of Ahmedabad region. Besides, it procures and provides Photocopies of articles from Journals received by the libraries in the region.

Current Content of Library and Information Science Journals: ADINET prepares consolidation of Content pages of Library & Information Science journals and provides the list to member libraries. On demand full texts of selected articles are also provided under document delivery service.

Continuing Education and Skill Enhancement of Library Professionals: ADINET performs several professional activities round the year. It runs course for fresh graduates of library science in Internet surfing and CDS/ISIS. It also maintains a database of available

jobs in and around and helps professionals in finding suitable jobs. It is consultant to several institutes for their requirement of suitable staffs. It runs Study Circle Meetings on last Friday of month where professionals share their experience. Time to time it conducts lectures of imminent scholars and professionals. Individuals can go to ADINET centre and access Internet for emailing, browsing, etc. Besides, ADINET provides several services on demand like, Computerization of library, Cataloguing, classification of library documents, Labeling and Shelving of books, Stock verification of library documents, Staff training, Planning for library development, etc.

ADINET maintains a website with URL as http://www.alibnet.org.

14.6.5 Mysore Library Network (MYLIBNET)

Mysore Library Network (MYLIBNET) was initiated in 1995 with the support of NISSAT. It is stationed in Central Food Technology Research Institute (CFTRI), Mysore. About 116 colleges/institutions are affiliated to the University of Mysore; of these 34 college libraries are located within Mysore. These were networked in the first phase.

14.6.5.1 Objectives

The objectives of the network are as follows:

- To share resources available with all the libraries;
- To provide a faster communication to all the libraries through Electronic Mail facility;
- To develop software tools for better library management;
- To create awareness in the field of latest Information Technology by conducting seminars/workshops/training programmes;
- To setup a Information base in collaboration with industries and
- To flash arrival of new books/journals, announcement of events like seminar/ workshop/training programmes.

14.6.5.2 Services

MYLIBNET provides following services:

Union Catalogue of Journals: In order to achieve the objective of 'Resource Sharing' for optimum utilization of available resources and to avoid as far as possible duplication, a project was initiated in 1990 by Academy of Information Science to conduct a survey & bringing out a hard copy of the "Union Catalogue of S&T Serials in Mysore City Libraries". The project has been completed and a hard copy of the catalogue was published in 1991.

Experts Database: The database contains the list of library professionals and their details. One can search for details of an Expert either by selecting the Name of the Expert or by selecting the Name of the Institute. The database is not very exhaustive and is still being developed.

E-Journals: MYLIBNET provides links to several free online e-journals in the field of medicine, physics, mathematics and chemistry. The list of journals are available from following website, http://www.mylibnet.org/hold.php.

14.6.6 Madras Library Network (MALIBNET)

MALIBNET was established in 1993 with the support of Indian National Scientific Documentation Centre (INSDOC). It provides information to the users in and around Chennai. Nearly 50 libraries in Madras are member contributing actively to the creation of various databases on MALIBNET.

14.6.6.1 Objectives

Following are the main objectives of MALIBNET:

- To foster growth in the field of information science & technology;
- To undertake scientific research in the field of library & documentation;
- To evolve a network of libraries & information centres in India;
- To establish appropriate links to national & international libraries and networks; and
- To facilitate resource sharing & information dissemination through networks.

14.6.6.2 Services

MALIBNET provides following services :

Databases: Directory Database of Current Serials - The directory contains information of 5200 serials currently subscribed by 50 libraries in Chennai. It covers journals in the area of basic sciences, applied science & technology, medicinal science and life science discipline. The service is available online and on diskette and search can be performed on title, subject and by library options.

Content Database: The Content database of MALIBNET holds article index of nearly 500 journals online fully searchable through author, title and keyword options. It is distributed through E-mail and on diskettes.

Specialised database for Automotive Industries: MALIBNET maintains a specialized database covering Automobile Engineering discipline which is useful for Research Professionals and Industrialists. It covers a number of national and international journals.

NUCSSI (National Union Catalogues of Scientific Serials in India): MALIBNET also maintains National Union Catalogues of Scientific Serials in India, Chennai Region covering 60 libraries. This union catalogues is very useful in cooperative acquisition of journals as well as locating the journals.

Medicinal and Aromatic Plants Abstracts (MAPA): MALIBNET maintains database of "Medicinal and Aromatic Plants Abstracts (MAPA)", which covers 600 journals with 19000 records starting from 1990.

Patent Database: This database covers patent details in scientific research. It presently, holds about 40,000 records. The coverage is since 1970s.

Polymer Science Database: It also maintains database on polymer chemistry and related topics with coverage of over thirty national and international journals.

Content Search Service: This service allows a search on the contents database existing at MALIBNET. It contains almost 500 online journals. This database is searchable through journal title, year, volume & issue. Results are sent back to the user through E-mail. Requests for availing these services can be made by filling up a request form. Any member library can use this service.

Literature Search Service: On request, one can avail this service. Keywords for performing literature search is available through the above mentioned databases at MALIBNET.

Document Procurement Service: MALIBNET provides full text of articles from Science and Technology journals. One needs to provide journals, year, volume, & issue along with page numbers. The service is available on nominal charge.

MALIBNET maintains a website with URL as http://www.angfire.com/in/malibnet/.

14.6.7 Bombay Library Network (BONET)

Bombay Library Network (BONET) was established in 1994 with financial support from the NISSAT. It has 25 members in the city of Mumbai. Located in the National Centre for Software Technology (NCST, now CDAC) a number of computers and software for shared use to the members. The services offered includes access to bibliographic databases, email, CD-ROM, etc. The BONET conducts seminars and training programmes for member institutions.

There are several other city level networks, which are in their initial stage of developments.

14.7 ISSUES RELATED TO LIBRARY AND INFORMATION NETWORKS

The objective of library and information network is for resource sharing among libraries as well as easy access to information. But it requires heavy implementation of Information Technology (IT). Though IT has facilitated the access to information but unfortunately there are many issues needed to be addressed. The libraries require high-speed connectivity to Internet which in turn require specific hardware and software for creation of system. Installation of a system is not the only issue which should be addressed. Libraries should make conscious effort for training the staffs who are involved in delivery of service and the user who are to be served. One of the major outcome of such networks is accessibility of Online Public Access Catalogue (OPAC), which in turn requires adhering to particular standard. Library network must follow one bibliographic standard but selection of a particular standard is a subjective issue which needs to be addressed in very beginning.

India is big country with many different languages and culture. Growth of literature is there in all the language. In such a multilingual environment rendering service in once own language and script is very big challenge. There is a conscious effort at Documentation Research and Training Centre, Bangalore towards rendering multilingual OPAC service for users. A system has been developed which converts records on the fly in different Indian scripts.

14.8 SUMMARY

In this unit an effort has been made to make students understand the concept of Library and Information Network. The unit has discussed the role of library network and it's objectivity in today's environment. Unit also discussed about different kinds of networks like LAN, WAN and MAN. There is detailed section in the unit about DELNET, INFLIBNET, CALIBNET, MYLIBNET, ADINET and MALIBNET. The unit has discussed in detail about the goals and objectives of these networks and their services. At the end of the unit students are exposed to different problem areas which are needed to be addressed at the time of building such system.

14.9 ANSWERS TO SELF CHECK EXERCISES

1) With the information boom it is very difficult for the libraries to have everything on a given subject. To cope up with the problem, library should come together and start sharing their collection and available resources. Library Network acts as a channel for resource sharing and plays a vital role in information transfer and dissemination.

   i) It provides consortia based access to journals or databases.

   ii) It helps in cooperative acquisitions and collection development.

   iii) It enables libraries to make their OPAC available for others for searching a document.

iv) It facilitates national and international cooperation among libraries.

v) It facilitates further opportunities of creating of services like, Digital libraries, Personalized SDI (Selective Dissemination of Information) etc.

2) There are three kinds of networks:

i) Local Area Network (LAN): When the networking of the computers is done within a campus or building it is known as Local Area Network.

ii) Wide Area Network (WAN): When the networking computers is done within the large geographical area it is known as Wide Area Network.

iii) Metropolitan Area Network (MAN): When the networking of computers is limited within the city limits it is known as Metropolitan Area Network.

3) INFLIBNET is playing a major role in the development of library automation. The thrust is more in following areas:

Library Networking: INFLIBNET is a national body which is promoting library automation of Indian University Libraries. INFLIBNET is providing leased line for university libraries to access Internet for communication among scholars, students and researchers. With this network backbone it is connecting the libraries and information centres in universities, deemed to be universities, colleges, UGC information centres, institutions of national importance and R&D institutions, etc.

Same line is used by Indian universities to access online e-journals subscribed by UGC under UGC-INFONET scheme. INFLIBNET has become the hub for UGC-INFONET program.

Library Automation: INFLIBNET has developed a automation solution for Indian libraries called SOUL (Software for University Libraries). It works in client server environment. Currently, it is developed in Windows environment and UNIX version of SOUL is under development.

Education: INFLIBNET runs courses in library automation and training in SOUL. The duration of courses are one week. It also provides on site training for library staff. It also conducts workshops and seminars in designing and developing digital libraries.

4) DELNET runs following services for its members:

- Inter Library Loan Online;
- Retro-Conversion and Creation and Maintenance of Bibliographic Databases;
- Training Programmes;
- Conferences, Lectures and Workshops;
- Newsletter;
- INTERNET, Electronic Mail AND Videoconferencing.

Besides, there are many databases to which it provides online access:

- Union Catalogue of Books in Common Communication Format (CCF);
- Union List of Current Periodicals: in science and technology, social sciences and humanities;
- Union Catalogue of Periodicals;

- Database of Periodical Articles;
- Indian Specialists: A Who's Who: For eminent scientists, educationists and writers from all over the country;
- CD-ROM Database;
- Union List of Video Recordings;
- Union List of Sound Recordings;
- Union List of Newspapers;
- Union List of Serials: Management Libraries;
- Union List of Serials: Petroleum and Natural Gas;
- Union Catalogue of Hindi Books;
- Multilingual Books: Sample Database;
- Urdu Manuscripts Database;
- Database of Theses and Dissertations;
- DEVINSA Database.

5) CALIBNET provides following services on demand and to member libraries:

- Software Development
  - Sanjukta
  - Parapar
- Current Content Service: Confile Service
- Document Delivery Service: Caliborder
- Selective Dissemination of Information: ConAlert
- Institutional Resources Development Services
- Databases

Through website it provides links to:

- Overseas Library Resources on India
- Worldwide Library Catalogues
- National Libraries of the World

14.10 KEYWORDS

Backbone : A high-speed line or series of connections that forms a major pathway within a network.

Bandwidth : The amount of data passing through a connection over a given time.

Internet : Network of networks or a vast collection of inter-connected networks that use the TCP/IP protocols and that evolved from the ARPANET of the late 60's and early 70's.

Intranet : A private network inside an organization, which uses software like that used on the Internet, but is for internal use only, and is not accessible to the public.

Network : An interconnection of three or more communicating entities or A system of computers interconnected by telephone wires or other means in order to share information.

Node : Any device connected to a computer network. Nodes can be computers, or any network appliances.

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Websites

ADINET : www.alibnet.org

CALIBNET : www.calibnet.org

DELNET : http://delnet.nic.in

INFLIBNET : http://www.inflibnet.ac.in

MALIBNET : http://www.angelfire.com/in/malibnet

MYLIBNET : http://www.mylibnet.org

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6	Certificate in Women's Empowerment and Development	CWED	10+2 or its equivalent OR Non 10+2 with three years of working experience as development activist at any level	No Bar	6 months	2 years	Rs. 1300/-	English/ Hindi
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