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LIBRARY AND INFORMATION NETWORKS WITH SPECIAL REFERENCES TO INDIA : DELNET, INFLIBNET, ERNET, NICNET

Objective :

In this lesson, we will discuss the Information Networks with reference to India and some of the important Indian networks like Inflibnet, Delnet, Ernet and Nicnet.

7.1 Introduction

Library and Information network may be defined as a combined effort of two or more libraries to share their resources for providing better services to their user community.

The first library cooperation activity in India is reported to be the catalogue of manuscripts compiled by Whitney strokes in 1767. Union catalogue development was a major cooperative effort in Indian libraries up to the 1960s. We can look at the following union catalogue development activities.

The 1960 also saw a large number of national seminars devoted to the concept of library cooperation. However with the advent of computers in library work, a change occurred. It is reported that the first use of the computer in the library work for the production of the union list of serials using the IBM/602 machine at INSDOC was performed in 1964. Since the library automation has been a matter of primary importance in Indian libraries. With the establishment of national informatics centre (NIC) in 1975 the development of NICNET in 1977, networking and communicating technology in India received a major boost. This as a whole had a major influence in resource sharing among various libraries and information centres through networks. The 1990s are said to be the golden period of library networking in India. There has been a plethora of publications and seminars on library networking during this period. Today besides INFLIBNET there are various library networks in India such as CALIBNET, DELNET, PUNENET, MYLIBNET etc.

Resources sharing is sharing of library resources such as document collection, staff members, technical facilities and mechanical aids among the participating libraries on the basic principle of cooperation, "All for one and one for All." In this respect it is possible to consolidate the document collection of participating libraries, exchange their technical capabilities and share their services. In this way it is possible to share the resources to provide online access to the vast amount of library and information sources to a larger user community at the least cost. The objective of resource sharing is obviously to make the greatest amount of best information available to the most users at the reasonable cost.

There has been a voluminous growth of published documents in the recent past. As a result no library is able to procure process or store all documents that its users demand. According to Kent, it is difficult for anyone single library to acquire even one percent of the total documents published in the world, due to one or more of the following reasons :

1. Growth of knowledge in different subjects.
2. Rapid increase of literature and growth of publication.

Therefore some resource sharing a necessary between one library and another library to acquire more information in a specific subject with low cost as published records are increasing at an incredible rate and their prices are keeping pace, in such circumstances library cooperation will assume a pivotal role and resource sharing will become a focal point of cooperation.

7.1.1 Resources Sharing Through Networks :

Earlier, the idea of resource sharing for a long time was restricted to the area of lending of books and periodicals. Now it has become diversified and incorporated the various activities of the libraries such as abstracting and indexing, acquisition, bibliographic access, cataloguing, circulation, collection, development continuing, education for staff and user literature searching management and accounting, referral services, storage and union lists.

The first few decades have witnessed knowledge and information explosion the world over and inadequate and financial resources to do the best in terms of distribution of knowledge and information. Under these circumstances, resource sharing and cooperative functioning of libraries and information centres through networking became vital. Efficient resource sharing can be achieved by using recent advancement in IT, i.e. networking of libraries and information centres through LAN, MAN, WAN and so on.

Network of information/resource sharing is to use the computer and telecom link for transmission of information or data from one library to another. Keeping this concept in view, various library networks have been established for cooperation and resource sharing among libraries. Not all the networks confirm to the essential functions of library networks. It is noted that the essential functions should include :

* Promotion of resource sharing.
* Delivery of documents.
* Creation of resources sharing tools like bibliographic databases such as union lists of serials, union catalogue of books, bibliographic database of articles and other types of materials such as CDs, video recording, theses etc.
* Adoption of international standards for creation of records uniformly.

7.1.2 The Indian scenario in resource sharing :

Economic pressures, growth of publications and emergence of subject specialization have compelled the libraries and information centres to think of sharing and information resources and optimizing the use of existing resources within India as well as from abroad through various networking systems. Some of the notable networks in India are NICNET, ERNET, DELNET etc. In addition, there is a major initiative from the UGC called INFLIBNET, interconnecting universities, colleges and resource institutions countrywide.

(a) National level resources sharing :

INFLIBNET, a national level resource sharing of university libraries was set up in 1976. INFLIBNET is a multiple functions/service network with focus on resource sharing and cooperation through computer communication links. It is useful to all the libraries and their readers. For this purposes, it is possible to

create data banks in different subject fields, produce a number of bibliographic tools and information services. It is also possible to conserve a lot of library resources avoiding duplication at the national level.

(b) State level resource sharing :

In India, formation of a network of university libraries in all states is possible only if the concerned administrative and professional staff and supporting agency make a sincere attempt in this direction. They should plan to coordinate programs of all the universities in the state to form a uniform academic calendar. They have to establish a body like council of higher education to initiate a network of libraries in the state say KAULIBNET (Karnataka State University Library Network) in the interest of larger academic community. They should bring all the affiliated colleges within the fold of state level library network and extended the services to colleges.

(c) City Level Resource Sharing :

Specialized library networks have come up for individual cities like DELNET, CALIBNET, PUNENET etc. These networks are meant essentially for providing a centralized database of library information to be accessed by its user libraries, mostly in a particular city for the purpose of resource sharing.

7.2 INFLIBNET

Information and Library Network Centre (INFLIBNET) is an autonomous Inter-University Centre for the University Grants Commission (UGC) of India. It is a major National Program initiated by the UGC in 1991 with its Head Quarters at Gujarat University Campus, Ahmedabad. Initially started as a project under the IUCAA, it became an independent Inter-University Centre in 1996.

INFLIBNET is involved in modernizing university libraries in India and connecting them as well as other information centers in the country through a nation-wide high speed data network using the state-of-art technologies for the optimum utilization of information. INFLIBNET is set out to be a major player in promoting scholarly communication among academicians and researchers in India.

7.2.1 Objectives of INFLIBNET

The primary objectives of INFLIBNET as envisaged in Memorandum of Association are :

* 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.

7.2.2 Functions of INFLIBNET

In order to fulfill the broad objectives, INFLIBNET will :

* Promote and implement computerization 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 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.
* Enable the users spread 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 where from 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 to helping the weaker resource centres by stronger ones.
* Train and develop human resources in the field of computerized 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.
* Create and promote R&D and other facilities and technical positions for realizing 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.

7.2.3 Departments of INFLIBNET

7.2.3.1 Database Development and Management Group

1. Database Development and Management Group.

* Provide reliable access to document collection of libraries i.e. Union Catalogues etc.
* Provide access to the world wide bibliographical information.
* To maintain consistency and quality in databases created by the participating libraries.
* Evolve standards, uniform guidelines, methods, and procedures, both for data capturing as well as Hardware and Software.

Major Activities

Development, managing and updating of Union databases is one of the major activities of the INFLIBNET. This group is working hard to meet this objective. Nine databases have been developed and are continuously growing in terms of quality and quantity. Following is the list of databases :

* Books - Represents holding of participant libraries under the program.
* Theses - Doctoral theses submitted to various Indian universities till date.
* Serial Holdings - Holdings information of various university libraries about the serial.
* Current Serials - Currently subscribed journals by the universities.
* Secondary Serials/CD-ROMs - Holdings information of the universities.
* DDC Serials - Currently subscribed journals by the six universities identified as DDC.
* Experts - Useful data about specialists in various disciplines.
* Research Projects - Information about ongoing projects.
* NISSAT Project - Experts Database (Science & Technology).

Standards and Formats required for creation of Databases

(a) Guidelines for Data Capturing : A User Manual

To maintain consistency and quality in databases prepared by the INFLIBNET Centre and libraries, INFLIBNET Centre had constituted a taskforce consisting experts in this area. This taskforce has brought out a 100 pages document entitled Guidelines for Data Capturing : A User Manual. This document is prepared based on Common Communication Format (CCF), 1992 edition and same has been given to participating libraries for adoption.

(b) SOUL Guidelines for Data Capturing : A User Manual for Documents

This is designed to be a handy manual to create records in SOUL. The User guide lists all bibliographical elements covered in the SOUL, with complete description of each field and sub-fields for Books, Theses, Serials etc. It also provides

guidelines as per AACR - 2 as to how to render the information in each field and sub-field with examples.

(c) Creation and Maintenance of Authority File

INFLIBNET is suggested libraries to use Library of Congress Subject Headings (LCSH) as a standard for providing subject headings. INFLIBNET is going to create and maintain the Authority Files of names and subject headings in the machine readable form and it will be linked with the Union Catalogue and Library Automation Software Soul developed by INFLIBNET.

Infrastructure

Well equipped laboratory with latest Intel PIV/RISC computers running on different operating systems like DOS, Windows 2000/2003 and Linux/Unix.

7.2.3.2 Database Research and Development Group

Creation of union databases of Books, Serials, Theses etc. has been one of the major objectives of INFLIBNET and the Database Research and Development group has been set up to address the problems involved in the development, maintenance and updating of these union databases. Development of software tools for converting data from one format to another, effective retrieval and managing the databases are the major areas of work undertaken by this group.

Major Activities

* Database design, analysis and technical support.
* Assisting participating libraries in database development.
* Development of utilities for database creation, conversion and maintenance in different formats like CCF and MARC 21 etc.
* Development of Utility tools for Retrospective conversion of union catalogues.
* Administration (routine jobs like backup, turning and implementation of security policies etc.) of Union Database servers in the Centre.

Infrastructure

Well-equipped lab with latest Intel PIV/RISC computers running different operating systems like windows 95/97/2000/XP, LINUX, UNIX.

Development tools : Microsoft Visual Studio, SDK.

RDBMS : Microsoft ACCESS, Microsoft SQL SERVER 7.0/2000, ORACLE 7i/9i, SYBASE Adaptive Server.

7.2.3.3 E-Education Group

E-Education Group is concerned with the R & D and keeps abreast with latest technological changes in the area of computer technology. This group was established sometime in August 2001 and is responsible to implement Web-Based Training (WBT) to technocrats and Professionals.

This group is promoting R & D activities in area of e-learning. One of the major

objectives of this group is to collaborate with Universities/colleges for setting/ managing e-learning lab for various training/e-courses.

Major Activities

* The Group is concerned with all the technical and non-technical issues related to e-learning in general and Web Based Training in particular.
* Plan, evaluate, implementation, review of e-learning policies, models, softwares and technology.
* Setting up e-learning Lab at INFLIBNET premises. Development of retrieval software for CD-ROM based bibliographic Databases.
* Exploring various options regarding e-learning.
* Preparation of analysis, and minimum critical resources.
* Assessment, preparation and recommendation of system requirements for e-learning set up.
* Planning, preparation and recommendations for e-learning preparation work and infrastructure for the set up.
* Preparation of road map for e-learning activities for the coming next few years.

7.2.3.4 Software and R&D Group

Major objective of this group is to develop software for Library automation and other supporting tools for library automation. This group is also involved in supporting all other activities of the centre by providing adequate software help time to time. The mission of this group is to provide technological support to all activities of the centre with software developments using latest technologies and available development tools.

Major Activities

Development, managing and updating of Union databases is one of the major activities of this group. Eight databases have been developed and are continuously growing. Following is the list of databases :

* Development of New Version of SOUL
* Incorporation of Various Bibliographic standards in SOUL
* Constant Update of Current version based on user requirements
* Trouble Shooting and Customer support for SOUL users

Future Plans

* Development of fully web based library management system.
* Incorporation of Multilingual Interface (to be developed by Database R & D Group) in SOUL
* Incorporation of Data Conversion Utilities (To be developed by Database R & D Group) for conversion of Various Bibliographic format including MARC and CCF in to SOUL

* Development of MARC 21 based database creation tool.

Infrastructure

Working Platforms of this group :

Operating Systems : Windows NT 4.0, Windows 2000, Windows XP, Windows 2003.

RDBMS : MSSQL Server 6.5, MS SQL Server 7.0, MS SQL Server 2000, Sybase 11.5, Oracle 9i

Development Tools : Power Builder 6.0, Microsoft Visual Studio 6.0, Microsoft Visual Studio, Met, Oracle, Internet developer suite, etc.

7.2.3.5 Web Development Group

Organization of vast information present on the Centre's website and making the website a resource gateway and a knowledge hub, to the user community is one of the main objectives of the INFLIBNET Centre. The web development group set up in promoting the access to the information in the field of research and academic pursuit by using latest web technologies is working towards in implementing this objective. The major areas of work undertaken by this group are to select, organize and present the quality resources of the Centre in a meaningful way that will be useful for the user community.

Major Activities

* INFLIBNET Website design and updating.
* Promoting the website of the centre and providing a complete statistical report of users accessing the website.
* Maintenance of various web services running at the site.
* Identifying the Hardware, Software requirements in improving the Center's Infrastructure with the latest available technologies.
* Installing and providing support for the available software at the Centre and advising the participating libraries with regard to hardware and software requirement.
* Bringing out SOUL software CD's for all the versions i.e. SOUL network version, SOUL Stand alone version & SOUL Demo version.

Future areas of development

Setting up an Intranet for managing the internal information of the Centre.

Infrastructure

Well equipped Pentium-IV systems running windows 97/2000 and Linux operating systems. The web server is hosted on a Pentium-IV system and is likely to switch over to a rack-mount machine. There is one CD writer to burn with SOUL software CD.

7.2.3.6 Networking and Quality Control Group

This group has been created for promoting R & D activities in area of Networking and Quality management. Major responsibility of this group is to manage, maintain and timely update the campus wide Network. One of the major objectives of this group is to coordinate with UGC-NETWORK, the proposed wide area network connecting all academic institutions under University Grants Commission for setting/ managing data centre for various databases of INFLIBNET, Indian universities, Information Centres. This group is working progressively for implementing. Total Quality Control (TQC) for in-house developed software. Training/workshop in the area of network management, security design and state-of-the-art technologies for library professionals across the country is being initiated by the group. Consultancy work in the area of networking, network security of universities/colleges library is also going to become thrust area of this group.

Major Activities

* LAN/WAN Setup and maintenance of INFLIBNET.
* Assisting Universities/colleges for Campus LAN.
* Design network security policy.
* Network Traffic management.
* Network resources allocation to the other groups.
* System administration, configuration and tuning.
* Database administration and tuning.
* Disaster recovery plan for e-resources.
* System maintenance at Centre.
* Testing and Quality control of software developed at the centre.
* Guidelines, suggestions and standards to all development groups for maintaining quality.

Infrastructure

Well-equipped server laboratory with Intel PIV servers running on Windows NT/2000 Advance Server. Separate mail server is running on Lunix. Network is protected by Firewell running on Linux. Centre has 512 kbps & 2 mbps leased lines from ERNET for Internet connectivity.

7.2.4 Activities of INFLIBNET

7.2.4.1 Human Resource Development :

To enhance the skills of University Library staff for implementation of INFLIBNET Program, following training courses and workshops are conducted :

One month Training Program

This is mainly meant for operational staff of libraries. They are given exhaustive training on application of computers to library and information services. Eighteen such programs were held covering most of the universities, and around 350 persons have been trained.

On-site Training Program

Staff from INFLIBNET Centre visited 31 universities, and conducted training for the library staff members for a week initiating automation process using CDS/ ISIS and ILMS software.

ILMS Training

Ten Librarians from different universities spent a week at INFLIBNET to solve their problems in using ILMS.

SOUL Training

Soul was installed at 600 + Libraries and onsite training of one week to the library staff was provided at each site.

Workshops

Six workshops for senior level staff via, University Librarians and Deputy Librarians were conducted.

7.2.4.2 Software development :

Library Management Software

For the automation of in-house functions of participating university libraries, INFLIBNET centre has developed a user-friendly state of art GUI based software named '**SOUL**' Software for University Libraries. This is based on Client/Server architecture. It uses a robust RDBMS as back end tool. This works on Windows and Windows NT environment with a number of new features.

Library Software Management

Utility Softwares :

Following utility softwares developed at the centre are available to the universities on request.

* To search the data from union databases (OPAC).
* Catalogue card generation.
* duplicate checking of records.
* Customized software for books, thesis, and serials.
* Data conversion from Dbase, FoxPro and text file to ISO-2709 format.

7.2.4.3 Database Development :

Development of Union databases is one of the major activities of INFLIBNET Centre. Eight databases have been developed and are continuously growing. They pertain to

* Books
* Theses
* Serial holdings
* Current serials
* Experts
* Research projects

* Secondary serials/CD-ROMs, and
* DDC serials

7.2.4.4 Networking :

Present Networking Management

"UGC-INFONET" linking more than 172 universities across the country.

Local Area Network

INFLIBNET Centre has suggested all the UGC funded universities to set up Local Area Network (LAN) using Hub/Switch and CAT 5 cables within their libraries for successful installation of SOUL software. Since SOUL is based on client/server architecture, it is essential that the server and all other nodes be connected by LAN.

INFLIBNET Centre desires that each university should establish a LAN in its campus linking all the departments including library. This LAN in turn will be connected to the UGC-INFONET.

7.3 (DELNET) Developing Library Network

Delnet started as a network of libraries in Delhi in 1988 and was named as Delhi Library Network. It is the first operational library network in India. It was initiated as a project of the India International Centre with the financial and technical assistance by National Information system for Science and Technology (NISSAT), Department of scientific and industrial research, Govt. of India. It was registered as a society in June 1992 under the society registration Act of 1760 and is currently being promoted by the National Informatics Center (NIC), Planning commission, Govt. of India and India International Centre, New Delhi.

During the recent years, increase in information has led to increase in the demands of the users. It has been noticed that in this area of information explosion, libraries in India are generally ill-equipped to handle and retrieve information effectively; the financial resources and the space requirement for housing library collection are limited in almost all of the libraries. Not a single library can afford to house every necessary document even in the area of its interest. Resource sharing thus assumes great importance at this juncture the option left with the forward looking librarians has been to promote the sharing resources by automation and networking.

7.3.1 Objectives of DELNET are the following :

* To promote sharing of resources among the libraries by developing a network of libraries, by collecting, storing and dissemination of information and by offering computerized services to the users.
* To offer guidance to the member libraries on cataloguing database services, circulation, acquisition, serials control, online services, selection of hardware and software etc.

* To coordinate efforts for suitable collection development and reduce unnecessary duplication wherever possible.
* To establish a referral centre to facilitate catalogue search and maintain a central online union catalogue of books, serials, and non book materials of all the participating libraries.
* To develop specialist bibliographic database of books, serials and non book materials.
* To possess and maintain electronic and mechanical equipment for fast communication of information and delivery of electronic mail.
* to coordinate with other regional, national and international networks for exchange of information and documents.

7.3.2 Delnet Services

7.3.2.1 Promotion of database creation :

For effective networking, standard bibliographic data should be available in machine readable form with the libraries. So, efforts were made from the very beginning to promote standardization of databases in the DELNET libraries. Regular meetings of librarians and computer specialists were organized to discuss mutual problems and the areas of cooperation. DELNET provide technical assistance to member libraries in the following areas :

* Creation and maintenance of bibliographic databases.
* Serials control
* User services
* Hardware and software requirements.
* Union catalogue preparation.
* Current awareness and SDI services.
* Authority data completion.
* Subject profile construction.
* Abstracting services.
* Inter-library loan and user services.
* Document copying facilities.
* Access to local, national and international databases.

7.3.2.2 Resource sharing

DELNET saved foreign exchange worth Rs. 10 million by rationalizing subscriptions to foreign periodicals during 1991, 1992 and 1993 through resource sharing. It is hoped that in the years to come, DELNET would be able to save more foreign exchange for India through sharing of periodicals resources. DELNET has also introduced its own courier with the financial help of NIC for interlibrary lending among the participating libraries. The service is well used.

7.3.2.3 Standardization

A standardization committee of DELNET has been meeting from time to time. The standardization committee takes into account the following areas :

* Input output format
* Communication format for interchanging bibliographic data.
* Bibliographic description : mandatory and optional data elements.
* Classification scheme and subject headings.
* Thesaurus
* Authority files.
* Language scripts into roman scripts.
* Forms of heading.
* Identification numbers, codes and abbreviations.
* Data input for abstracting and indexing.
* Search/command language.

7.3.2.4 Online databases

DELNET has around twenty databases available online for its users. These are :

(a).	Union catalogue of books: UCF	**(b).**	CD-ROM database.
(c).	Union list of Video recordings.	**(d).**	Union list of Sound recordings.
(e).	Union list of current periodicals.	**(f).**	Union catalogue of periodicals.
(g).	Database of periodic articles.	**(h).**	Indian specialist database.
(i).	Union list of Newspaper.	**(j).**	Urdu anuscripts database.
(k).	Books in print database.	**(l).**	DEVINSA database.
(m).	Serials: Petroleum and Natural gas.	**(n).**	Multilingual books: sample database
(o).	Database of thesis and dissertations.	**(p).**	Union cataloguing of Hindi books.

(q). Jain database.

(r). Directory of libraries.

(s). Union catalogue of books: MARC Format

(t). Union list of Serials of Management Libraries

7.3.2.5 Electronic Mail Service

DELNET provides RENNIC Email facility to its member libraries, which is introduced by National Informatics Centre. This gives access to both national and international Email users and also to Internet users. Email is being used not only for communication between institutions but also for inter-library loan requests.

Full Internet Connectivity

DELNET is providing full Internet facility through NIC to the member libraries.

Web Page

DELNET also has a web page (http:/ /www.delnet.nic.in/) on Internet. This enables all internet users the world over to know about DELNET and its activities.

7.3.2.6 Products

DELSIS

A major breakthrough has been achieved by DELNET with the launch of DELSIS, powerful library networking software. DELSIS (DELNET system for information services) is an integrated modular system, which support DELNET online databases.

It provides powerful and existence facilities for online enquires for books, serials, bibliographical details about the specialist and supports the cataloguing of books in Indian languages.

7.3.3 Features of DELSIS

* DELSIS is a user friendly menu driven package.
* Its versatile options allow the users to retrieve the information quickly.
* It contains the modules for Online Public Access Catalogue as well as the modules for the creation of databases e.g. Addition, deletion, insertion of records etc.
* The Online Public Access Catalogue components of DELSIS can meet the needs of the users, irrespective of whether the user has little computer experience or is familiar with using computer to perform various library tasks.

DEL-WINDOWS

DELNET has released the DEL-WINDOWS version 1.0 after the successful creation and implementation of DELSIS Unix version. It is an efficient tool for creating and retrieving bibliographic databases and catalogues.

Some of the salient features are :

It is simple and easy to use.

It is user-friendly with adequate windows menus for data inputting and search capabilities.

It provides the option for creating the bibliographic records either using ECF or the MARC format.

DELSEARCH

DELNET has opened a new chapter in the information retrieval procedure by devising the new database access mechanism through DELSEARCH. It is an offline remote database access system through Email. It is the first of its kind and is the most economical and user-friendly remote database access system.

7.3.4 The Other Services

ILL Online

DELNET members can place their inter-library loan request through the ILL facility, which is available on the union catalogue of books database. The member requests appear on the main server, which are monitored by DELNET staff at regular intervals and the books are acquired and supplied to the requesting library through the courier.

DEL-LISTSERVE

DELNET has created a listserv service called DEL-LISTSERV to provide current awareness services to users and allow the member libraries to receive the latest daily information from the internet automatically in the form of electronic mail.

Retro-conversion

DELNET offers retro-conversion facilities to the libraries through specialized agencies and also facilities the use of modern tools such as CD-ROM's and online facilities of retro-conversion.

Referral services

DELNET maintains a referral centre that provides reference facilities to participating libraries. The referral centre also looks after the access to the central database and monitors access to central databases.

Document transfer facilities

DELNET provides the facility for transferring or copying of the documents to its users.

Training Programs

DELNET conducts training programs in the use of DELNET services, software, Email, AACR-II and LC subject headings, internet etc. from time to time; information about future training programs is available on the request.

Lectures and Workshops

DELNET organizes lectures by networking specialist working in different parts of the world. The lectures are open to members; specialists and users in general. DELNET also organizes national workshops, seminars and meets on library networking from time to time.

Newsletter

DELNET publishes a newsletter in order to spread the message and increase the awareness about library networking in India. Through this newsletter, DELNET communicates to its members the progress, it is making in various fields.

7.3.5 The Future of DELNET

The future of DELNET is very promising. Its membership with India and outside India is going to take a quantum jump. The DELNET is growing in number and size and as a variety of information on South Asia is becoming available through DELNET,

it is expected that all the institutions outside India specializing in South Asian studies to take DELNET membership. DELNET databases are going to be accessible through Internet which will make accessibility very fast. Internet users in India are increasing and it will increase DELNET presence in different parts of India.

7.4 ERNET

ERNET was initiated in 1976 by the department of Electronics (DoE), with funding support from the government of India and United Nations Development Program (UNDP), involving eight premier institutions as participating agencies-NCST (National Centre for Software Technology) Bombay, IISc (Indian Institute of Science) Bangalore, five IITs (Indian Institute of Technology) at Delhi, Bombay, Kanpur, Kharagpur and Madras, and the DoE, New Delhi. ERNET began as a multiprotocol network with both the TCP/IP and the OSI-IP protocol stacks running over the leased line portion of the backbone. Since 1995, however almost all the traffic is carried over TCP/IP.

ERNET (Education and research network) has made a significant contribution to the emergence of networking in the country. It practically brought the interest to the India and has built up national capabilities in the area of networking, especially in protocol software engineering. It has not only succeeds 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, UNDP has lauded ERNET as one of the most successful programs it has funded. 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 creation of a new organizational set-up in the form of a society. The Science community of the country has also recognized ERNET's contribution--both for infrastructure services as well as for R&D. The Scientific Advisory Committee to the Cabinet has adopted ERNET as the platform for launching an S&T network in the country.

7.4.1 The Objectives of ERNET India

* Research and development.
* Training and Consultancy.
* Content development.
* ERNET operations, i.e. providing state of the art communication infrastructure and services to academic and research institutions, Govt. organizations, NGOs, Private sector R&D organizations and various other non commercial organizations.

7.4.2 Achievements

Foundation of national capability building in the area of computer networking laid through :

* Generating manpower at different levels.

* Making the world of standards (TCP/IP, OSI etc) well understood.
* Setting up of a chain of core groups at the participating agencies with a minimal set of lab facilities and creation of skilled manpower to carry out R&D.
* Providing an insight into emerging issues such as ATM networks, Networked multimedia, and the information structure.

Network infrastructure and services set up, including :

* Installation, maintenance and operation of large campus LANs.
* Design, commissioning and testing of SATWAN hub and the installation of VSATs.
* Seamless interconnection of LAN-WAN segments, and multiprotocol capability provided.
* Provision of the whole range of Internet services.
* Deployment of TDM/TDMA based VSAT network for internet access.

7.4.3 Research and Development

Research and development in the area of computer networking has been the forte of ERNET. The ERNET backbone is a judicious mix of terrestrial and satellite based wide area networks. The satellite WAN, using VAST technology has facilitated reliable and quick access from remote areas. The VAST network act as an overlay for the terrestrial WAN by providing backup links between the backbone sites. 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. ERNET architecture is based on industry standard TCP/IP protocol, ensuring connectivity from heterogeneous computer systems and local area networks at user sites.

ERNET International Gateway : ERNET Head Quarter New Delhi, ERNET HUB Bangalore, NCST JUHU Mumbai, Inter University Centre for Astronomy and Astrophysics (IUCAA) Pune, IIT Chennai, University of Hyderabad, IISc Bangalore, Orissa computer Application Center (OCAC) Bhubneshwar, Variable Energy Cyclotron Centre (VECC) Calcutta.

7.4.4 ERNET Backbone Sites

ERNET is supported by the following backbone sites which enable organizations located at different geographical locations to access various services. ERNET head quarter, New Delhi.

Centre for Software Technology, Mumbai.
Indian Institute of Science, Bangalore.
Institute of Technology, Chennai.
Indian Institute of Technology, Kanpur.
Indian Institute of Technology, Guwahati.

University of Hyderabad.

Centre for Advance Technology, Indore.

Inter University Centre for Astronomy and Astrophysics, Pune.

Orissa Computer Application Centre, Bhubneshwar.

ERNET VSAT HUB, Bangalore.

Communication is the key-in more ways than one. And a prerequisite for communicating is a connection, a link. ERNET India supports different connectivity options to connect wider user bases located even in remote areas.

7.4.5 Connectivity Options :

The various connectivity options available to ERNET users are :

* **Dial up UUCP**

Services accessible: Email, newsgroup services

Requirements: Telephone connection, high speed modem, a PC 376/476 machine running Windows/Unix or a LAN.

Advantages: Ideal as a starting point, especially for a small user sites, at a close distance from an ERNET backbone. Provides a store and forward system, and can be programmed for dialling at night to minimize cost.

* **Dial up IP**

Services accessible: Full range of IP services.

Requirements: Telephone connection, high speed modem, a PC 376/476 machine running windows/Unix or a LAN.

Advantages: This is more of a stop gap before a leased line/ VSAT/ radio link becomes operational.

* **Leased Lines (analog or digital)**

Services accessible: Full range of IP services.

Requirements: Leased line between the site and the nearest ERNET backbone, a pair of high performance modem for analog lines, or a CSU/DSU pair for digital lines, PC 376/476 system running Windows or Unix, and TCP/IP protocols, a router to provide access to LAN interconnected at user site.

Advantages: Provide a cost effective link and economy of online access to network resources.

* **VSAT**

(a).TDM/TDMA

Services accessible: All IP services.

Requirements: VSAT terminal installation, router, high performance modem V.32 bis, system running Unix or Windows NT with TCP/IP, or a cluster of such systems.

Advantages: Recommended for a large organizations or sites requiring high level of reliability especially when distance to ERNET backbone is large. Also the

only feasible option for remote areas where leased lines are not practical.

(b). SCPC (Single Channel per Carrier)

Advantages: High speed of 64 Kbps to 2 mbps.

* **Radio link**

Services accessible: All IP services.

Requirements: Radio modems, router, system running UNIX or Windows NT with TCP/IP, or a cluster of such systems.

Advantages: Recommended for large organizations or sites requiring high level of reliability especially when distance to ERNET backbone is well within the line of site.

7.5 NICNET

The national informatics centre (NIC) was setup in March, 1975 by the government of India to play a promotional role in creating computer awareness and for developing and implementing computer based information systems for decision support in ministries and departments of central government. The last decade has witnessed NIC emerge as an agent of change which has quietly changed the work culture and the process of decision making in a number of government departments and their subordinate organizations through out the country.

NIC provides state of art solutions and decision support for information management and decision support requirements of the government of India and the corporate sector. NIC has set up a satellite based nation wide computer communication network, called NICNET, with over 700 nodes connecting the national capital, the state capitals and districts headquarters. The information technology services provided by the NIC range from conducting feasibility studies for developing and implementing computer based information systems, undertaking large networks and imparting training. NIC has developed extensive expertise in integrating IT based systems with the working of user organizations. NIC continues to provide value added services network such as E-mail, database access, internet etc. NIC has emerged as an agent of change in the user's organization by providing cost effective training solutions in the key IT areas.

7.5.1 Facilities and services

The facilities offered over NICNET include :

7.5.1.1 Gateway to Internet

With the incorporation of NICNET national information highway as an overlay network over the existing network, NICNET has become a very viable gateway to internet, in the country. NICNET maintains its leading edge with the incorporation of a powerful Ku-based national info highway as an overlay network on the existing SSMA/CDMA architecture. It is connected to over 200 international networks in 160 countries through gateway packet switched service (GPSS) and has dedicated

internet access through a direct high speed link to SPRINTNET, USA.

7.5.1.2 Electronic mail

Email allows a user to send message electronically to individuals or group of individuals as long as there are networks connecting them. For many users Email is the first real exposure to, and use of internet. Internet mail makes mail delivery more reliable. One can also make requests for database searches through electronic mail and have the results mailed back.

7.5.1.3 USENET

USENET is the bulletin board service (BBS) of internet. Electronic BBS are very effective way to share information. The messages in USENET are organized into thousand to topical groups or "newsgroups" which cover specific areas of interest. USENET is read and contributed to, on a daily basis by millions of people. There are several ways one can be USENET user. For example, a user can read lots, ask question, answer questions, participate in discussions etc.

7.5.1.4 Telnet Protocol

Telnet allows an internet user to login to a remote host from the user host. Once connected and logged into the remote host, the user can enter data, run programs, or do any other operations just as if he were logged in directly to the remote host. While running telnet, the program effectively makes the local computer invisible during the session on the remote computer.

7.5.1.5 FTP

File transfer protocol makes it possible to move a file from one computer to another, even if each computer has different operating system and file storage formats. The files may be data, programs, text anything that can be stored on line. Users are required to login to each computer, thus ensuring that they have the right to take and put files on those computers.

7.5.1.6 EDI over NICNET

Electronic data interchange (EDI) service over NICNET provides an electronic mailbox facility for receiving EDI messages, storing and forwarding them to the trading partners of the Indian exporters and importers.

7.5.1.7 Research and Education Network of NIC (RENNIC)

NICNET, the nation wide satellite based computer communication network offers network service to research, education and medical institutions at their very doorsteps through RENNIC with several objectives :

* To promote creation and use of on-line databases in the country.
* To facilitate more openness among academic and researchers.
* To facilities library networking services.
* To provide on-line access to vast expanse of international databases.

7.5.1.7 Multimedia video conferencing through NICNET

NIC has created a high quality video conferencing facility utilizing 'NICNET'. National info highway, which operates from 127 kpbs to 2 mpbs.

At present NIC centres at Delhi, Calcutta, Bangalore, Pune and Ahmedabad are connected with the studio group video conferencing systems. NIC is also providing desktop video conferencing services from another major 7 cities-Patna, Jaipur, Hyderabad, Mumbai, Bhopal, Chennai and Chandigarh in addition to Delhi.

NIC has planned for multimedia communication to be a major priority in the next few years. Multimedia systems development program was launched by NIC in September 1991 with the overall objective of introducing multimedia technology as an integral part of informatics services provided by NIC. Multimedia engineering and facility division (MEFD) has been set up as a part of NIC's ambitious plans in the field of multimedia communications. Utilizing this resource, NIC has the vision to provide low cost multimedia solutions to the Indian market.

NIC will also be creating studies for video conferencing on internet/intranet using MBONE technology (one way video broadcast/two way audio) which will be useful in the field of distance education.

7.5.1.9 Bibliographic Information Services

NIC has been providing NICNET based MEDLARS services in the area of bio-medical services and health care in the country. The MEDLAR database is the very large database having more than 6 million records of more than 15 Gigabytes. More than 120 institutions in the country utilize this service. NICNET based medical information network connecting all the medical colleges and hospital in the state of Tamil Nadu has been established. In association with Indian bio-medical research institution, NIC continued to disseminate to all concerned information related to diseases such as Buffalo parks, Dengue, Malaria, Meningitis and kala-azar, which are feared to be assuming epidemic proportions, by compiling information from all the possible sources.

7.5.1.10 Judis-CDrom

NIC is serving the legal community through IT since 1992 when the COURTIS (Court Information System) project was commissioned for streamlining registries of various courts. Since then, NIC with the constant support of the supreme court of India has taken great strides. Today all high courts have been computerized and interconnect through NIC's satellite based computer communication network NICNET; most of them are taking out automatised daily cause list on computers. COURTNIC and NICNET have enable the readily availability of information on cases pending in the supreme court at high courts and also from any of the thousand VSAT nodes of NICNET spread across the country.

7.5.1.11 General Information Services Terminal

NIC has set up GISTNIC services as well as GISTNIC web for common public

and government departments and organizations.

7.5.1.12 BASISplus and TECHLIBplus software for library automation

NIC has introduced BASISplus and TECHLIBplus software products for the development of text databases and documentation management. BASISplus is a relational DBMS, with full text retrieval and management capabilities in the client/server environment. TECHLIBplus is a complete library automation package having facilities for:

1. Online patron access catalogue.
2. Cataloguing.
3. Serials control
4. Circulation control
5. Acquisition control
6. And Administration.

BASISplus provides facilities of development of websites over NICNET and also WWW-based application for Intranet/Internet environment. Interfaces to Oracle databases and Foxplus databases have also been developed to operate in client/server mode. NIC has become the value-added seller of BASISplus in India.

7.5.1.13 Training

NIC conducts awareness programs in IT for

1. Central/state government officials.
2. Department of Personnel and Training sponsored training program in information tools, application of NICNET based information system in Decentralized planning, and NICNET based computer aided project management system.
3. Executive development programs.
4. Sectoral development programs.
5. Update programs in the area of Internet, technology, networking technology, GIS technology, database technology and multimedia technology.

7.6 Keywords :

Networks, RENNIC, Delsis, INFLIBNET, ERNET, DELNET, NICNET.

7.7 Self Check Exercise :

Q.1. Discuss major Library and Information networks with special reference to India.

Q.2. What is INFLIBNET ? What are its functions ? Discuss the various departments of INFLIBNET.

Q.3. What is DELNET ? What are the various services provided by the DELNET ?

Q.4. write an essay on ERNET.

Q.5. Write an essay on NICNET.

7.8 Suggested Readings :

"Information Networks in India" by R.S.Aswal, ESS ESS Publications, New Delhi.

LESSON NO : 2.2

WRITER : MR. VISHAL SINGH

THE INTERNET : WORLD WIDE WEB (WWW), HYPERTEXT, HYPERMEDIA, MULTIMEDIA, INTRANET AND EXTRANET

Objective :

In this lesson, we will discuss the Internet, its working, protocols and its applications in libraries. We will also discuss Multimedia, Hypermedia and the World Wide Web.

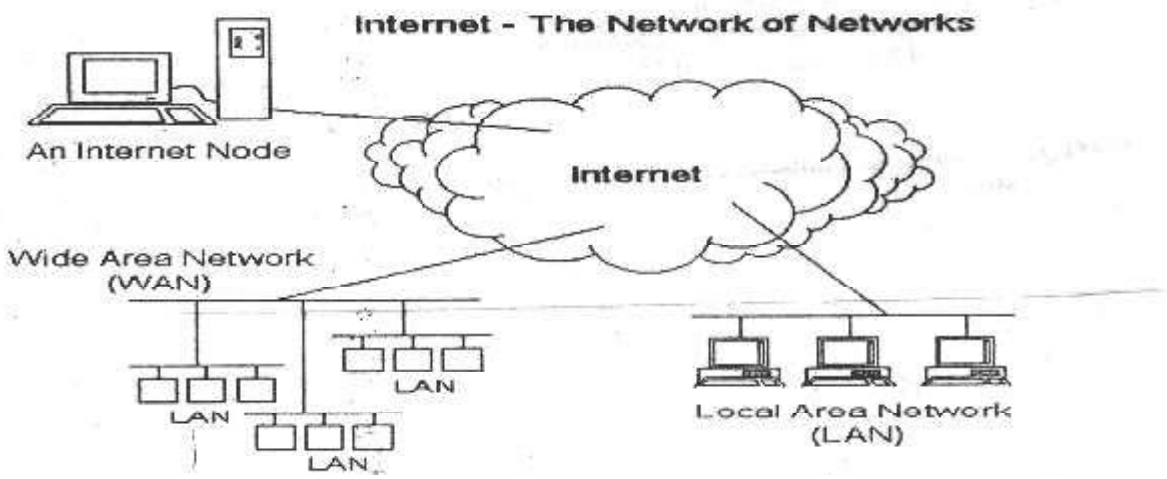
8.1 Introduction : Internet

The Internet is a computer network made up of thousands of networks worldwide. No one knows exactly how many computers are connected to the Internet. It is certain, however, that these number in the millions and are growing.

No one is incharge of the Internet. There are organizations which develop technical aspects of this network and set standards for creating applications on it, but no governing body is in control. The Internet backbone, through which Internet traffic flows, is owned by private companies.

All computers on the Internet communicate with one another using the Transmission Control Protocol/Internet Protocol suite, abbreviated to TCP/IP. Computers on the Internet use client/server architecture. This means that the remote server machine provides file and services to the user's local client machine. Software can be installed on a client computer to take advantage of the latest access technology.

An Internet user has access to a wide variety of services : electronic mail, file transfer, vast information resources, interest group membership, interactive collaboration, multimedia displays, real-time broadcasting, breaking news, shopping opportunities, and much more.



8. 1.1. How does the Internet work ?

The internet is defined as a “network of networks”. The formal definition of the network is : “An interconnection of two or more autonomous computers”. Interconnection means that the computers are able to exchange message and data.

Autonomous means that no computer can forcefully start, stop, or control another computer. At its most complexes, as in the internet, a network is a globe spanning, heterogeneous mix of technologies and operating systems.

The internet mostly connects network of computers. Think of a corporate wide network; each department has a LAN that allows it to share files and may be a printer or two. Several departments, working together, interconnect their networks so that information may be shared more easily among the departments. These “regional” networks are interconnected based on geography (same city, same state, same group of states) or function (accounts-receivable grouped with accounts payable into an accounting network, for example).

Then the regional networks are connected together onto a corporate network, sometime called a “backbone”. So, there is a user connected to a Local Net; a Local Net connected into a regional Net; and regional Nets connected to a backbone. This is the Global Internet.

Unlike commercial networks such as CompuServe or Prodigy, the internet is not run by one central computer or computers. This is both its greatest strength and greatest weakness. The approach means it is virtually impossible for the entire Net to crash at once-even if one computer shutdown, the rest of the network stays up. The design also reduces the cost for an individual or organization to get onto the network. But thousand of connected computers can also make it difficult to navigate the Net and find what you want–especially as different computer may have different commands for plumbing their resources. It is only recently that Net users have begun to develop the sorts of navigational tools and “maps” that will let neophytes get around without getting lost.

Nobody really knows how many computers and networks actually make up this Net. Some estimates say there are now as many as 5,000 networks connecting nearly 2 million computers and more than 15 million people around the world. Whatever the actual numbers, however, it is clear they are only increasing.

8.1.2. Data Flow across the Net

Consider the transfer of message from one computer to another. Each message has an address on it. The E-mail handling system on the sender’s computer packages the message and perhaps for “shipping”. The message is broken up into small pieces called “packets”. Packets are one of the basic units of measurement on the internet. Packets have different sizes, depending on what application “packed” them. You can think of them as envelopes or suitcase full of information. The packets are all addressed to the final destination. In fact the packets that contain the message may not all travel the same path. Along the possible path are special purpose computers called “routers”. These computers do nothing but look at network addressed and

figure out from the address what is the current best route to the destination address.

Routers make their decisions based on information that is constantly reaching them from all over the Net. They hear from other routers about links that are down, about others that may be congested and slow, or about routers that are no longer accepting packets from certain destinations. Each packet's destination and proposed route is evaluated individually, in the blink of eye and sent off along the best route for that particular packet at that particular moment.

The same sort of decision making is made for all packets that traverse to internet. Each time a packet is forwarded either to another route near its ultimate destination or to that destination if the router is the final router on the path. The destination computer is the one that unpacks the packets, throw away "envelopes", and hands of the E-mail message.

8.1.3 Internet Addressing

There are two kinds of addresses in the internet : Domain Names & IP Addresses.

1. **Domain Name System (DNS):** Every computer on the internet has a domain name. The names of the domain describe organizational or geographic realities. They indicate what country the network is in, what kind of organization owns it, and in some cases, the names are defined in even more detail. Domains can be Non-geographic or Geographic.
2. **IP Addresses :** Every node on the internet, every end point (which might be a computer or a dial-in modem), has a unique identifying address. These unique identifiers are called Internet Protocol Addresses. The computer or server is known as a host, and the IP address, its physical network connection is known as the host address. The IP address can be difficult to remember, is easy to enter incorrectly, and will not necessary remain same if someone need to reorganize his or her network. The difficulty with these addresses is what led to the creation of DNS names, which map IP addresses to a set of more easily remembered words.

The IP address is a set of numbers that express the exact physical connection between a computer and the network on the internet. In some senses you can think of them in the same way you think about the telephone numbers: a phone number uniquely describes your connection to the telephone network.

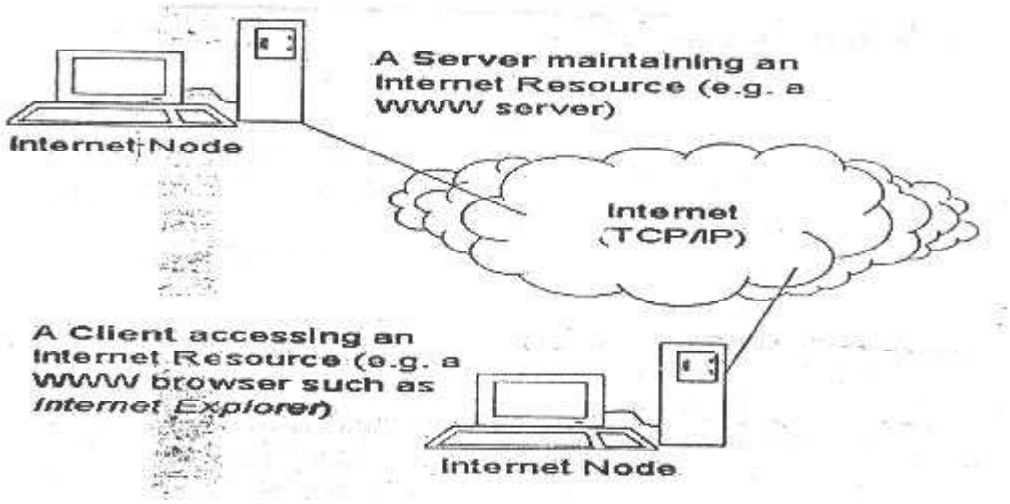
8.1.4 Internet Protocols

Protocols are the rules that the networks all use to understand each other. The various protocols are set of technical specifications that let computer exchange information, no matter what kind of computer they are, or what kind of technology hooks them together. Vendors of software and hardware want their products to be useful on the internet, and so make sure those products understand and operate with the internet protocols. The term interoperability has been coined to describe this ability

of disparate types of hardware and software to work together under a common set of rules.

TCP/IP is a set of protocols developed to allow cooperating computers to share resources across a network. It was developed by a community of researchers centered around the ARPAnet. Certainly the ARPAnet is the best known TCP/IP network. However, as of June, 87, at last 130 different vendors had products that support TCP/IP and thousand of networks of all kinds use it.

Whatever it is called, TCP/IP is a family of protocols. A few provide “low-level” Functions needed for its applications. These include IP, TCP and UDP. Others are protocols for doing specific tasks, e.g., transferring files between computers, sending mail, or finding out who is logged in on another computer. Initially TCP/IP was used mostly between minicomputers and mainframes. These machines had their own disks, and generally were self-contained.



8.1.5 Internet Application in Libraries

Internet is undoubtedly a growing technological phenomenon. It is a source of electronic information. Further it is an excellent medium for communication. Because of these reasons internet is influencing the practice of librarianship throughout the world. The technological changes are constantly influencing the libraries and their services. In the few years internet even became a hot topic at conferences and in library literature. It is changing the way in which libraries and information personnel communicate. As a matter of fact access to the networked information resources offer a supplement to the collection of libraries. Librarians working in the technical services interact with vendors in a number of ways in order to face the issue of cataloguing the net resources. The electronic publishing on internet is affecting the documentation

of such resources leading to complexities in citation.

Internet use in libraries has brought efficiency in services ranging from acquisition of documents to the retrieval of information as well as creation of new knowledge. It is used in libraries, broadly for the following functions:

Library management includes all library functions taking place behind the scene as well as with the users of the library. The most important functions are discussed below:

Use of internet in Acquisition

- Tender for books can be floated on the internet.
- Checking of duplication before ordering.
- Books order can be sent through the web
- The availability of the addresses of booksellers, publishers, distributors and their catalogues help in selection and purchase of the library materials.
- Library orders can be sent through E-mail.
- Users can know about the possible availability of the desired books in the library through internet.
- The information available on the web relating to acquisition of books or for comments can be sent to the library through the internet.

Use of Internet in serials control

- Communication of the approval for journals on the internet.
- Web based ordering exercise.
- Access to journals by users through the web.
- Selection of journals through the list of publishers and their catalogues available on the web.
- Listing of the received journals through internet access.
- Availability of the union catalogue of journals.
- Viewing of full text of journals.

Reference and Information Service.

Internet is also used to answer the question of the users in the library. So internet can help in the following ways:

- Identification of reference sources according to the needs of the users.
- Search of subject directories on internet in answering the queries.
- Guiding users to the reference sources to enable them to search the desired information on their own.

- Identification of the available sources and listing them for future use.
- Identification of the full-text journals available freely on the web.
- Internet is useful for providing access to databases. OPAC, current contents etc.
- It is useful for maintaining uptodate information about library services, collection staff etc.

Library Management

The following techniques are used in the library management :

Electronic Mail: Librarians use Email to communicate with colleagues and customers. They participate in electronic discussion groups, share experiences and ideas with other librarians, and create and monitor discussion group of interest to their customers.

Telnet: Librarians use telnet to connect to remote computer resources. They explore other library catalogues, access commercial and non commercial database services, and share the resources of campus-wide information systems and community free-nets.

File transfer protocol: File transfer protocol enables librarians to obtain software programs, text, images, and sound files from the net and then offer them to their customers. Librarians and information professionals contribute to the internet community by making library catalogues and local database available on the network; creating gopher sites that offer logical, well organized, menu-driven access to services and resources on the internet; and establishing the WWW servers that provide the graphical user interface for browsing the resources of the internet.

So, with the use of internet, the role of library has highly revolutionized. The user who had geographical limitations can now have access to the information available anywhere in the world.

8.2. World Wide Web (WWW)

The World Wide Web was developed in 1888 by Tim Berners-Lee of the European Particle Physics Lab (CERN) in Switzerland. The initial purpose of the Web was to use networked hypertext to facilitate communication among its members, who were located in several countries. Web was soon spread beyond CERN, and a rapid growth in the number of both developers and users ensued. In addition to hypertext, the Web began to incorporate graphics, video, and sound. The use of the Web has reached global proportions and has become a defining aspect of human culture in an amazingly short period of time.

World Wide Web has accelerated the growth of internet by giving it easy to use, “point and click” graphical interface. Users are attracted to the World Wide Web because it is interactive, easy to use, combines graphics, text, sound, animation

making and it is a rich communication medium. The World Wide Web is many things to its millions of users. It is used as a market-place, art gallery, library, school, publishing house and what ever else its author creates. The WWW provides a network of interactive documents and software to access them. It is based on documents called pages that combine text, pictures, forms, sound, animation and hypertexts links called hyperlinks. To navigate the WWW users “surf” from one page to another by using “point and click” operation on the hypertext in text and graphics.

The World Wide Web also referred to as the WWW or W3 or simply “the web”, is the universe of information available via the hypertext transfer protocol (HTTP). The web presents information as a series of “document” called as web pages that are prepared using the hypertext mark up language (HTML). By making use of HTML, the documents author can specially code sections of the document to “point” to other information resources. These specially coded sections often referred to as “hypertext-links”. The user viewing a web page can select the hypertext links and can easily connect to the information resource that the links points to. These links lead to other documents, images, sounds, databases (like library catalogs) etc. While accessing the WWW, it is not necessary to follow a hierarchical path to information resources. Thus, we can easily :

1. Jump from one link to another.
2. Jump to specific part of a document.
3. Go directly to a resource, if you know a URL (uniform resource locator).

So as the web page is not hierarchical and handles graphics, it offers a great deal of flexibility to the user.

8.2.1 Internet Protocols

Almost every protocol type available on the Internet is accessible on the Web. Internet protocols are sets of rules that allow for intermachine communication on the Internet. The following is a sample of major protocols accessible on the Web:

E-mail (Simple Mail Transport Protocol or SMTP)

Distributes electronic messages and files to one or more electronic mailboxes.

Telnet (Telnet Protocol)

Facilitates login to a computer host to execute commands.

FTP (File Transfer Protocol)

Transfers text or binary files between an FTP server and client

Usenet (Network News Transfer Protocol or NNTP)

Distributes Usenet news articles derived from topical discussions on newsgroups.

HTTP (Hypertext Transfer Protocol)

Transmits hypertext over networks. This is the protocol of the Web.

The World Wide Web provides a single interface for accessing all these protocols. This creates a convenient and user-friendly environment. Once upon a time, it was necessary to be conversant in these protocols within separate, command-level environments. The Web gathers these protocols together into a single system. Because of this feature, and because of the Web's ability to work with multimedia and advanced programming languages, the Web is by far the most popular component of the Internet.

8.2.2 Hypertext and Links: The Motion of the Web

The operation of the Web relies primarily on hypertext as its means of information retrieval. Hypertext is a document containing words that connect to other documents. These words are called links and are selectable by the user. A single hypertext document can contain links to many documents. In the context of the Web, words or graphics may serve as links to other documents, images, video, and sound. Links may or may not follow a logical path, as each connection is created by the author of the source document. Overall, the Web contains a complex virtual web of connections among a vast number of documents, graphics, videos, and sounds.

Producing hypertext for the Web is accomplished by creating documents with a language called Hypertext Markup Language, or HTML. With HTML, tags are placed within the text to accomplish document formatting, visual features such as font size, italics and bold, and the creation of hypertext links. Graphics may also be incorporated into an HTML document.

HTML is a sub language of SGML, or Standard Generalised Markup Language. SGML is a system that defines and standardizes the structure of the document. Both SGML and HTML utilize descriptive markup to define the structure of an area of text. HTML is standardized and portable. A document that has been prepared using HTML markup "tags" can be viewed using a variety of web browsers such as Netscape and Lynx. A browser interprets the tags in an HTML file and presents the file as a formatted, readable web page. In addition, HTML documents can be viewed on all types of system, such as Macintosh, PC and UNIX machines.

8.2.3 Pages on the Web

A web page is a single unit of information, often called a document that is available via the World Wide Web. A web page can be longer than one computer screen and can use more than one piece of paper when it is printed out. A web page is created using HTML. It consists of standardized codes or "tags" that are used to define the structure of information on a web page. These codes enable web pages to have many features including bold text, italic text, headings, paragraph breaks and numbered or bulleted list. A web page can be created by user activity. For example, if you visit a Web search engine and enter keywords on the topic of your choice, a page will be created containing the results of your search. In fact, a growing amount of information found on the Web today is served from databases, creating temporary

Web pages "on the fly" in response to user queries.
Access to Web pages may be accomplished by:

1. Entering an Internet address and retrieving a page directly
2. Browsing through pages and selecting links to move from one page to another
3. Searching through subject directories linked to organized collections of web pages.
4. Entering a search statement at a search engine to retrieve pages on the topic of your choice.

8.2.4 Retrieving Documents on the Web: The URL and Domain Name System

URL stands for Uniform Resource Locator. The URL specifies the Internet address of a file stored on a host computer connected to Internet. Every file on the Internet has a unique URL. Web browsers use the URL to retrieve the file from the host computer and the specific directory in which it resides. This file is downloaded to the user's client computer and displayed on the monitor connected to the machine.

URLs are translated into numeric addresses using the **Domain Name System** (DNS). The DNS is a worldwide system of servers that stores location pointers to Web sites. The numeric address, called the IP (Internet Protocol) address, is actually the "real" URL. Since numeric strings are difficult for humans to use, alphanumeric addresses are employed by end users. Once the translation is made by the DNS, the browser can contact the Web server and ask for a specific file located in its site.

Anatomy of a URL

This is the format of the URL:

Protocol:/host/path/filename

For example, this is a URL on the Web site of the U.S. House of Representatives:

http:/www.house.gov/house/2004_House_Calendar.html

This URL is typical of addresses hosted in domains in the United States. Structure of this URL:

1. Protocol: http
2. Host computer name: www
3. Second-level domain name: house
4. Top-level domain name:gov
5. Directory name:house
6. File name:2004_House_Calendar_html

Note how much information about the content of the file is present in this well-constructed URL.

Several top-level domains (TLDs) which are common:

Com	commercial enterprise
Edu	educational institution
Gov	U.S. government entity
mil	U.S. military entity
net	network access provider
org	usually nonprofit organizations

New domain names were approved in November 2000 by the Internet Corporation for Assigned Names and Numbers **(ICANN): biz, .museum, .info, .pro (for professionals) .name** (for individuals), **aero** (for the aerospace industry), **and .coop** (for cooperatives). ICANN continues to investigate proposals for adding additional domain names, for example, .mobi for sites designed for mobile devices, and jobs for the human resources community.

In addition, dozens of domain names have been assigned to identify and locate files stored on host computers in countries around the world. These are referred to as **two-letter Internet country codes,** and have been standardized by the International Organization as ISO 3166.

For Example

In	India
Au	Australia
Jp	Japan
Uk	United Kingdom

8.2.5 How to Access the World Wide Web: Web Broswers

To access the World Wide Web, you must use a Web browser. A browser is a software program that allows users to access and navigate the World Wide Web. There are two types of browsers:

1. Graphical: Text, images, audio, and video are retrievable through a graphical software program such as Internet Explorer, Firefox, Netscape, Mozilla and Opera. These browsers are available for Windows, Linux and other operating systems. Navigation is accomplished by pointing and clicking with a mouse on highlighted words and graphics.

You can install a graphical browser on your computer. For example, Internet Explorer is a part of the Windows operating system, and is also available on the Microsoft site:http://www.microsoft.com.

2. Text: Lynx is a browser that provides access to the Web in text-only mode. Navigation is accomplished by highlighting emphasized words in the screen with the arrow up and down keys, and then pressing the forward arrow (or Enter) key to follow the link. In these days of graphical browsers, it may be hard to believe that Lynx was once very popular.

8.2.6 Extending the Browser: Plug-Ins

When the browser encounters a sound, image or video file, it hands off the data to other programs, called plug-ins, to run or display the file. Working in conjunction with plug-ins, browsers can offer a seamless multimedia experience. Many plug-Ins are available for free. File formats requiring plug-ins are known as MIME types. MIME stands for Multimedia Internet Mail Extension, and was originally developed to help e-mail software handle a variety of binary (non-ASCII) file attachments.

A common plug-in utilized on the Web is the Abode Acrobat Reader. The Acrobat Reader allows you to view documents created in Abode's Portable Document Format (PDF). These documents are the MIME type "application/pdf" and are associated with the file extension .pdf. When the Acrobat Reader has been downloaded to your computer, the program will open and display the file requested when you click on a hyperlinked file name with the suffix .pdf. The latest versions of the Acrobat Reader allow for the viewing of documents within the browser window.

Web browsers are often standardized with a small suite of plug-ins, especially for playing multimedia content. Additional plug-ins may be obtained at the browser's Web site, at special download sites on the Web, or from the Web sites of the companies that created the programs.

8.2.7 Beyond Plug-Ins: Active X

ActiveX is a technology developed by Microsoft which makes plug-ins less necessary. ActiveX offers the opportunity to embed animated objects, data, and computer code on Web pages. A Web browser supporting ActiveX can render most items encountered on a Web page. As just one example, Active X allows you to view and edit PowerPoint presentations directly within your Web browser. ActiveX works best with Microsoft's Internet Explorer.

8.3 Hypertext

Hypertext is text displayed on a computer display or other electronic device with references (hyperlinks) to other text which the reader can immediately access, or where text can be revealed progressively at multiple levels of detail. The hypertext pages are interconnected by hyperlinks, typically activated by a mouse click, keypress sequence or by touching the screen. Apart from text, hypertext is sometimes used to describe tables, images and other presentational content forms with hyperlinks. Hypertext is the underlying concept defining the structure of the World Wide Web, with pages often written in the Hypertext Markup Language (HTML). It enables an easy-to-use and flexible connection and sharing of information over the Internet. Hypertext is not just flat text with highlights or paragraphs

omitted during display, but rather, the text is hyper-structured with hyperlinks or other structures embedded inside a page, including hidden search words, to control the display and connection with other pages or hypertext nodes.

Types and uses of hypertext

Hypertext documents can either be static (prepared and stored in advance) or dynamic (continually changing in response to user input, such as dynamic web pages). Static hypertext can be used to cross-reference collections of data in documents, software applications, or books on CDs. A well-constructed system can also incorporate other user-interface conventions, such as menus and command lines. Links used in a hypertext document usually replace the current piece of hypertext with the destination document. A less known and used feature is Stretch Text, which expands or contracts the content in place giving more control to the reader in determining the level of detail of the displayed document. Hypertext can develop very complex and dynamic systems of linking and cross-referencing. The most famous implementation of hypertext is the World Wide Web, first deployed in 1992.

8.4 Hypermedia

Hypermedia is a term created by Ted Nelson in 1870. It used as a logical extension of the term, hypertext, in which graphics, audio, video, plain text, and non-linear hyperlinks interwine to create a generally non-linear medium of information. This contrasts with multimedia, which, although often capable of random access in terms of the physical medium, is essentially linear in nature. The World Wide Web is a classic example of hypermedia.

Hypermedia can be thought of as a visual, interactive and non-linear medium for communication, which is based on a human-computer interaction paradigm where the user can browse through a database using point and click interaction techniques. Thus, a graphical user interface and direct manipulation is essential to hypermedia.

Imagine having access to a large database which contains information on a wide range of topics, like an encyclopedia. The database can contain text, pictures, animations, sound, and even video recordings. The distinctive features of hypermedia is the ability to browse through the material in a variety of ways. This is accomplished by inserting connections between different parts of the material, linking them together. These links can be followed by the user in a very rapid fashion, using point and click interaction techniques.

Typical applications for hypermedia systems include: information dissemination, interactive encyclopedias, learning, education, reference databases, interactive presentations, simulations, idea processing, writing tools, personal information management, collaboration tools, games and entertainment, like interactive fiction and adventure games.

Hypermedia is an elaborated form of hypertext. The terms ‘hypertext’ and ‘hypermedia’ were coined by Ted Nelson in the early 1870’s. He envisioned a system called Xanadu, where all the literature of the world would be linked together in a gigantic world-wide distributed database. Annotations and cross-references would make it possible to browse through the literature quickly and easily. The difference between hypertext and hypermedia is that hypermedia, in addition to text, makes use of other forms of representation, like pictures, animations, and sound.

Many other researchers and computer pioneers have contributed to the evolution of hypermedia. Douglas Engelbart has made major contributions to the concepts and the technology underlying hypermedia, such as the invention of the mouse pointing device.

8.4.1 Networks of nodes and links

In hypermedia terminology, associations between different information items are called links, and the individual items are called nodes. A node can contain one or more links to other nodes, forming a network of nodes and links. Here a hypermedia network is also called hypermedia structure.

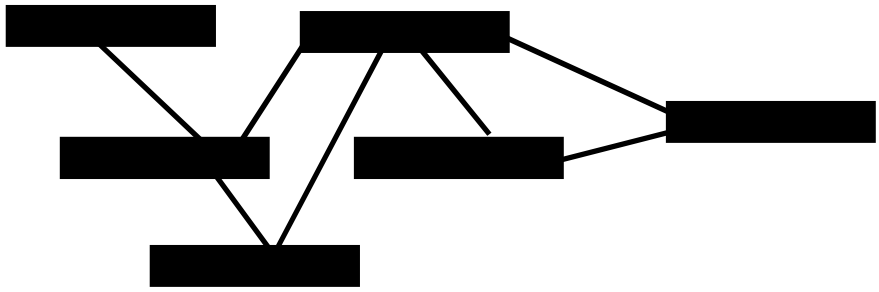


Figure : A hypermedia network. Nodes which contain information are related using links. Links and nodes can form a network of arbitrary structure and size

The user can move around the network in many different ways, randomly, purposefully, and so on. The ability to move quickly around the hypermedia network is critical to usability and is what makes browsing practical.

8.4.2 Ways to present information on the screen

Nodes can be presented on the display screen in a variety of ways. One approach is to display nodes in separate, possibly overlapping windows. Notes Cards is an example of a system which uses this method. Another approach is to display one node at a time using the entire screen space. This method is used in, for instance, HyperCard.

8.4.3 Reading Hypermedia

Hypermedia differs from printed media in a number of ways. The major difference is that hypermedia is non-linear in its form. It is possible to access the material in many different ways and jump around between different information items, given that the

author has provided the necessary links.

While printed material, for example books, use well known design conventions, like table of contents, index, page numbers etc., hypermedia systems often lack such well established design elements. The form of hypermedia systems is still experimental. Often each hypermedia author uses her own style and conventions. Hypermedia is also more abstract in its nature than printed media. Paper exists in the real world. In the simulated world of hypermedia it is not yet possible to physically touch and feel nodes and links.

8.4.4 Browsing and Navigation

Browsing and navigation are used frequently in the hypermedia literature. Both browsing and navigation describe the process of moving around the hypermedia network by traversing links.

The navigation process aims at finding some particular information item in the database, efficiently and quickly. It is like a captain on a ship who navigates across the sea in order to reach the destination. Browsing, by contrast, is more aimless. The user can browse around a hypermedia system without any specific question or precise idea about what she looking for. Browsing is like shopping for Christmas, we often have no specific idea of what we are looking for, we just know that we want to find a Christmas gift. When we browse through a department store, we may eventually come across a suitable present.

When navigating a hypermedia network the user must be oriented. She must know where she is and she must have an overall view of the world in order to find her way. If she becomes disoriented she might not be able to reach her goal as quickly as desirable. Instead she has to spend time on getting oriented again. This is like the captain at sea, who carefully must keep track of landmarks which can help the user back on track if she gets disoriented. Even though it is possible to browse through a hypermedia network without being oriented, the user is likely to end up frustrated and confused if she does not know where she is. Thus, orientation is desirable for browsing tasks too.

8.4.4 Hypermedia tools

A hypermedia system consists of a database and a user interface for browsing and navigating through the database. The database contains information in the form of a model of some domain. We will call the database of a hypermedia system for a hypermedia structure. The most common data model for implementing hypermedia structures is a network of nodes and links.

A hypermedia tool consists of an editor and optionally a high level language for creating hypermedia systems. Almost all tools place restrictions on what they can be used for. Most tools are, for example, restricted to a particular model for how information is presented on the screen. NoteCards, Hyper-Card and ToolBook are examples of tools for creating hypermedia systems.

8.4.6 Advantages of Hypermedia

1. One of the major advantages of hypermedia is the ability to quickly follow associations and look up related material. References can be traced both backwards and forward in a way which can be difficult and time consuming with printed media.
2. Through hypermedia, information can also be structured in a variety of ways. Multiple organizations of the same material allow for specialized structures for different user categories.
3. Hypermedia has a strong potential for learning applications since learning by exploration might be facilitated in a natural way. The student can browse the material and find new information as he/she explores a subject area.
4. Another possible advantage of hypermedia for learning applications is that hypermedia systems are usually considered as fun to use. The potential for visual richness and high degree of feedback could be regarded as positive by the users.
5. The exposure to hypermedia authoring tools help learners in improving his writing and process skills and gives learner a new and different perspective on how to organize and present information.

8.4.7 Disadvantages of Hypermedia

1. The ease of browsing might increase the risk that the learner skips through the material much too quick, and thus get a low and disjointed conception of the subject.
2. The risk of getting disoriented can result in confusion rather than understanding, especially if the user jumps around between different nodes in a more or less random manner.
3. To take full advantage of the benefits of hypermedia technology learners need sufficient on-line development time. The problem is further exacerbated when available computers are not configured for hypermedia authoring. For example, they may lack the capacity to digitize sound or input video.

8.5 Multimedia

Multimedia is a method of instruction that uses the computer to present information with text, graphics, audio or video. It is referred to as computer based training (CBT) or web based training (WBT). It can take the form of training, presentations, software simulation, job simulation, testing reference or online help. Since multimedia instruction is often delivered over the internet, it can look just like set of web pages, but it can also be delivered on CD-ROM, on diskette or over a Local Area Network (LAN) or company internet.

To actually see, hear, or otherwise experience these media, you need a computer equipped with the right hardware such as sound card, enough memory to make movies play smoothly, a big enough hard drive to store large file-formats files

and so on. And you need software installed on your computer, either as a part of a web browser or as a stand alone program that can interpret and display—or just "play"—the various media file formats. If you can put together all the ingredients then you can start to experience the internet as the world's largest CD-ROM, with new content appearing online daily.

Every web browser can at least download files. So if you can get a stand-alone program to interpret a multimedia file you have downloaded, then you can experience that medium even without a sophisticated web browser.

8.5.1 Delivery of Multimedia

There are two basic methods for delivering multimedia.

1. **CD-ROM** has become the most cost effective method of delivery for multimedia materials. These devices are used to store large amounts of some combination of text, graphics, sound and moving video.
2. **Distributed networks** allow computers to be connected to other computers which can provide an almost endless array of multimedia material. The internet is currently providing a distributed network approach to the delivery of multimedia material.

8.5.2 Advantages of Multimedia

The advantages of Multimedia are as under :

- **It's interactive:** Learners are actively engaged. Interactive may include multiple choice questions, fill-in-the-blanks, selecting all right answers or matching by dragging or dropping graphics. Feedback engages the learner even more. For example, an incorrect answer could provide a hint along with a "sorry that's incorrect" response.
- **It is tailored to learner needs:** Learners can take the training when they want, as often as they want, and at a pace that's right for them.
- **It is cost effective:** Companies don't need to pay for trainers, travel or classrooms. It is especially useful in situations where the users are spread over the wide area.
- **It is efficient and effective:** Learners typically learn more in a shorter period of time with multimedia instruction, as learners are more interested in multimedia messages which combine the element of text, audio, graphics and video.
- **It is easy to revise and update:** Especially with internet delivery, changes made to one copy are immediately available to all learners. For example, a company that manufactures car utility racks can easily alter installation instructions for consumers as car manufacturers introduce new car models every year.

8.5.3 Suitability of Multimedia

Cost : The expanse can vary widely. One can fine off-the-shelf or off-the-web training at very reasonable cost, and sometime even for free. Custom development of computer based training can be expensive, but may be worth it if employee or customer training is crucial.

Number of Learners: A very large audience, such as a large customer base, may reduce cost greatly and possibly allow delivering instruction more effectively and economically than with paper based instruction.

Location of Learners: If the learners are spread over broad geographical areas, such as with sales reps or travelling technicians, CBT or WBT may be the only way to provide accurate and effective training to everyone.

Availability of Computers: Equipment doesn't have to be sophisticated–all you may need is an internet connection.

8.5.4 The Types of Media

1. Pictures

The first geographical web browser, Mosaic, could display only one picture format when it first appeared-CompuServe's GIF (Graphic Interchange Format), which is a compressed file format. The other major picture format is called JPEG (named for the Joint Photographics Experts Group that designed the format). At first, Mosaic could only display JPEG in a helper application. When Netscape came along, it supported in-line JPEG, which now most browsers can now also handle. JPEG can be compressed to much smaller file sizes than equivalent GIFs, but more they are "squished" the worse the quality of the images becomes.

2. Sounds and Music

There are many different file formats available on the Net. The most common of these include Microsoft's WAV (Wave) format, perhaps the most widespread; the Macintosh AIFF format; the UNIX (originally NeXT).au format. Many websites offer sounds in more than one format, in order to make it easier for each user so download a file format local to their type of computer.

Other sound format includes MIDI (Musical Instrument Digital Interface); the Amiga SND format and MP2 or MPA, which are MPEG formats (MPEG is a movie format, but movies, of course, often also includes sounds, so the MPEG standard specifies a sound format as well.

A new approach to sound files (for movies files as well) is Streamlining. Streamlining is when files are sent a little at a time and start playing almost immediately. This model differs from those in which an entire file is sent and a part playing only after it has been completely downloaded. The most popular streaming format these days is called Real Player or Real Audio. This format allows sounds to be broadcast

something like the way they are in radio. Microsoft has also developed a competing sound-streaming format called **True sound**.

3. Movies and Animations

As with sounds and pictures, there are various competing movie and animation formats available on the Net. Technically, the difference between the movie and an animation is that movies use video or film images (variations on photographic technology) while animations use drawn illustrations.

Probably, the most widespread movie format is the **MPEG** (Motion Pictures Experts Group) format, a compressed format. Another popular format is **QuickTime,** which started on the Macintosh platform but can now be displayed on most computers. Quick Time Files usually have a .qt or .move extension. A third common movie format, native to the windows platform is .**avi**.

4. 3D Environments

The future of the Net may be glimpsed in the still-evolving 3D formats with which real or imaginary spaces are depicted in perspective, and the user has the ability to move around, viewing the space from multiple angles.

The most common format for 3D world on the web is called VRML, which stands for Virtual Reality Modeling Language. While VRML is an evolving standard, there are multiple competing implementations of it out there, including a version of QuickTime called, naturally enough QuickTime VR. VRML files have usually .wrl extension. One of the future goals of VRML developers is to create worlds in which many users can meet and interact, as if in person. There are also some special browsers out there, such as one called WebFX, designed specifically for viewing and moving through 3D spaces.

8.5.5 Different Ways to View Multimedia

1. Plug-ins

The most sophisticated way to work with multimedia files is to plug special add-on software directly into a browser. Such a program, usually called a plug-in, is an application that works in tandem with another program, enhancing its features as if you had taken a piece of hardware and added it to your computer to give it more features. Only Netscape Navigator has really exploited this approach fully. Its nearest competitor, Microsoft Internet Explorer, can handle only one specific add-in, what Microsoft, which always use its own term, called plug-ins. With plug-ins installed, a browser can then display an unusual format in-line, meaning inside the browser window, instead of launching an external program to display the file.

2. Viewers and Players

A viewer program is one that can be used to view or play a specific type of file. Even with the character-based browser like the UNIX program Lynx, you can still download files. It's true that you will then have to get the file from UNIX account to your

desktop computer, but after that, you can “play” the file downloaded if you have the appropriate software (such as sound recorder for windows) installed on your PC. This approach will also work with browsers. Such as AOL’s, that are not equipped to launch external programs automatically.

3. Compressed Files and Streaming Media

One of the strategies used to address bandwidth limitation is to compress files as much as possible, most often using widely accepted compression standards. This might mean converting media files, such as images, to compressed formats or it might mean compressing the original files with a “Zip” type program, and requiring that the recipient decompress it herself.

4. Helper Applications

Mosaic, Netscape Navigator and other browsers based on the graphical model have the ability to launch external programs called helper applications–when a non standard file format is selected. Helper applications will let your browser open files in formats it could not otherwise handle, such as Sun audio file. They do, however, have to be “taught” where to look for the helper application. You can either do this in advance, by entering the options or preferences area of the browser and looking for the helper applications or you can attempt to download a media file and then when the browser tells you it doesn’t recognize the file format, you can educate it about which viewer to use with that type of file. You do this simply by typing the path and file name for the correct program, or by clicking on a browse button and rummaging around on your hard disk for program you need. After that, your browser will automatically launch the right helper application whenever you select that type of media file again.

8.5.6 Applications of Multimedia

The multimedia is being used prominently in the following applications, but the day is not far off when we would see the multimedia messages around us everywhere.

1. Education

It is the most productive application of the multimedia. The earlier concept of “guru is the only source of knowledge” has undergone a sea change. The modern communication technologies have provided the student with many sources of information and education. The role of the teacher has transformed from “teacher” to a facilitator and a guide. The multimedia has provided the teachers with opportunities to go beyond traditional teaching methods. While the students have got a new way to discover the new learning methods. The market is flooded with the educational CDs which provide a good learning material for the students. The qualitative and mind boggling information on English pronunciation, learning other languages (French or German) physics, chemistry etc. The list is endless. The distance education branch of the universities has done away with providing voluminous study material. These days, the CD-ROMs have replaced the conventional study material. The highly informative encyclopedia has virtually changed rules of the games. The

encyclopedia Britannica and encyclopedia Americana is now available on CDs which otherwise takes the space of a full almirah in the library. Moreover, these CDs come with a search function. Just insert the CD and type the topic of interest and the material is there on the computer screen. Otherwise it takes hours together to search the bulky books of encyclopedias.

2. Business:

The corporate sectors are embracing the multimedia techniques very fast. The advertising executives can use various techniques of multimedia presentation while dealing with the clients. A visit to the trade fair shows and the exhibitions give an amazing picture of applications in business. The stalls of the companies have full size screens and computer monitors which keep on displaying their company, objectives, manpower, products and services etc. The customer feels impressed with the style of presentation and thrilling combination of sound and pictures.

3. Medical Sciences:

Medical education has benefitted immensely from the multimedia. The Internal structure of human beings and other animals are available on the CDs. A separate CD is available for each organ of the human body, like heart, brain, digestive system and reproductive system, etc. The art of successful operations can easily be learnt through multimedia. These days, multimedia CDs are used to convince the patients for their diagnose and treatment.

4. Entertainment:

The prime usage of the multimedia is the entertainment. The games on the CDs form the best entertainment material for the children, the movie magic and masti concept of the entertainment is made possible by CDs. The idea of Infotainment (Information + Entertainment) has evolved recently. The children are provided the information colored with entertainment to make it interesting. The Entertainment is such another word used for Education and Entertainment.

5. Public Places:

The multimedia has been put to use at important public places like airports, railway stations, bus stands—inside the buildings etc. The railway stations various multimedia information kiosks to know the train timings—arrival and departure, status of reservation of tickets, route of the train etc. The airports have the same facility for the airplanes. The passenger needs not to run from pillar to post to satisfy his query. In multistory buildings, the multimedia presentation can guide a person to his destination.

6. Media:

The advertising industry has started making creative and unbelievable ad films by using multimedia. Salman Khan and Sunil Shetty cannot jump from the train for a bottle of coke. This is made possible by using multimedia. Such ad films cost less and are more interesting. The creativity element of the advertising has indeed received a big boost after

the arrival of multimedia. The film industry uses special effects in audio and video. The heavy destruction, collision of vehicles, fire and bomb explosion are not real but done on multimedia computers. Virtual Reality (the special effect which is just like real but is not real. The water gushing out from the sinking Titanic ship was so realistic that the viewers felt that the water is actually flowing under their seats. The fighter pilots apply this simulation technique of virtual reality to train themselves in the artificial environment.

7. Animation:

Films in which drawings are photographed to create the illusion of movement, usually by means of exposing the film frame by frame. Alternative forms include use of puppets and clay-figure. More recently, computer techniques have been used to produce animation. The key exponent of cartoon animation was Walt Disney, who inspired the first wave of the large Japanese animation industry, but a reaction to his representational style subsequently produced a more graphic approach by both North American rivals and Eastern European practitioners. In the USA Winsor McCay, creator of the newspaper cartoon hero Little Nemo. Showed a series often animated films 1811-21 featuring Gertie the Dinasaur, which pioneered the modern cartoon film Japanese anime took off with the TV serials Tetsuwan atomu/Astro Boy 1863-67 by Osamu Tezuka (182.S-18H8). By 1882 about 40 animated weekly TV serials were produced in Japan; as well as feature-length films for video release. The former are mainly family-oriented; the latter, such as Akira 1838 by Katsuhiro Otomo, usually action-packed and aimed at youths. Ghost in the Shell 1885 by Mamuro Oshii, set in the year 2028 and based on a comic by Masamune Shirow: was given an international cinema release. The first frame-by-frame animation film is thought to be J.S. Blackton's Humorous Phases of Funny Faces 1806. In France, Emil Cohl began producing Vivacious cartoons such as Fantasmagorie 1808 and Les Joyeux Microbes 1808 animated. Computer-generated graphics that appear to move across the screen-Traditional animation involves a great deal of drudgery in creating the 24 frames per second needed to deceive the human eye into seeing a moving picture on film. In computer-generated animation, while humans still create the key frames that specify the starting and ending points of a particular sequence–a character running through a landscape, for example–computers are faster and more accurate at calculating the in-between positions and generating the frames.

The first completely computer generated character to appear in a major motion picture was the sea-water creature in James Cameron's film The Abyss 1880, developed at the leading special effects shop Industrial Light & Magic. It was quickly followed by the liquid-metal man in Camel-oil's Terminator 2,1881. The first entirely computer-animated full-length feature film was Pixar's Toy Shop, 1885, which was the first film ever to achieve independent motion of character and backgrounds in the same sequence.

8.5.7 Impact of Multimedia on Library Services

Multimedia not only helps the users in providing information from different media on one platform, but also saves on space. Money, maintenance, operational inconveniences

etc. The major advantages of multimedia in libraries are:

1. It can help satisfying different information needs such as reference, enrichment, entertainment, leisure etc.
2. It can help meeting various types of information preference of the users such as scholarly, scientific, vocational, artistic, recreational, etc.
3. Being a digital format, information can also be assessed by remote users on a network. It also helps in overcoming the accommodate users.
4. It is interesting and easy to use over existing form such as print microforms, online etc.
5. Its control and interactivity helps the users and provides the benefits of books and human beings.

"Nowadays many libraries feel that the multimedia should be integrated into the regular services by the libraries. Even in advanced countries libraries do not have a separate department of personnel responsible for multimedia products or services. For the past two three years, use of electronic resources, particularly multimedia in libraries has improved considerably." In India, most of the libraries are using multimedia resources for reference service and instructional purpose.

8.6 Intranet

Intranet is the generic term for a collection of private computer networks within an organization. An intranet uses network technologies as a tool to facilitate communication between people or work groups to improve the data sharing capability and overall knowledge base of an organization's employees. Intranets utilize standard network hardware and software technologies like Ethernet, Wi-Fi, Web browsers and Web servers. An organization's intranet typically includes Internet access but is firewalled so that its computers cannot be reached directly from the outside. A common extension to intranets, called extranets, opens this firewall to provide controlled access to outsiders. Many schools and non-profit groups have deployed them, but an intranet is still seen primarily as a corporate productivity tool. A simple intranet consists of an internal email system and perhaps a message board service. More sophisticated intranets include Web sites and databases containing company news, forms, and personnel information. Besides company email and Internet access, an intranet generally incorporates internal Web sites, documents, and/or databases.

Advantages of Intranets

Implementation benefits	▪ Fast, easy, low-cost to implement ▪ Based on open standards ▪ Connectivity with other systems ▪ Many tools available ▪ Scalable
Usability benefits	▪ Easy to learn and use ▪ Multimedia ▪ Hypertext links ▪ Single interface to information resources and services
Organizational benefits	▪ Access to internal and external information ▪ Improves communication ▪ Increases collaboration and coordination ▪ Supports links with customers and partners ▪ Can capture and share knowledge

8.7 Extranet

An extranet is a computer network that allows controlled access from the outside for specific business or educational purposes. Extranets are extensions to, or segments of, private intranet networks that have been built in many corporations for information sharing and ecommerce. Most extranets use the Internet as the entry point for outsiders, a firewall configuration to limit access, and a secure protocol for authenticating users.

8.8 Keywods:

Internet, DNS, IP address, TCP/IP, Protocols, Plug-ins, Multimedia, Hypermedia, Browsers, Hypertext, HTTP.

8.9 Self Check Exercise

Q. What is Internet ? Discuss its application in Libraries.

Q. What are Protocols ? What do you understand by TCP/IP ?

Q. What is Multimedia ? Explain the various types of media and different ways to view Multimedia.

Q. Write an essay on World Wide Web.

Q. Write down short notes on the following:

1. TCP/IP
2. Domain Name System (DNS)
3. IP address
4. URL
5. Multimedia
6. Hypermedia
7. W.W.W

8.10 Suggested Readings:

Internet for Everyone' by Leon & Leon, APH Publishing Corporation, New Delhi

Information Technology–Applications' by P.S.G. Kumar, BR Publications, Delhi

- The ABCs of the Internet" by Christian Crumlish, BPB Publications, New Delhi

Common Software

1. **Introduction**
2. **Difference between open software and proprietary software**
3. **Word Processing Software**
4. **MS-Word**
5. **Presentation Software**
6. **MS-PowerPoint**

1. Introduction

Proprietary software means the company that developed the software owns the software and no one may duplicate it or distribute it without that company's permission. Users have to pay to the software company if they want to use the proprietary software. Examples: MS-Office-2007, Adobe Photoshop CS3, Windows 8 etc.

Proprietary Software has existed since the first IBM computer was implemented and sold to a business as the first IT solution. An operating system is software consisting of programs and data that runs on computers, manages the hardware, executes software and also manages services. The operating system is the most important component of the computer, without it the user cannot run an application, unless the application is self-booting. Operating systems are found on nearly any device that contains a computer, from cellular phones and video games, to supercomputers and web servers. Windows operating system is the example of proprietary software.

Open source refers to software whose source code — the medium in which programmers create and modify software — is freely available on the Internet; by contrast, the source code for proprietary commercial software is usually a closely guarded secret. The most well-known example of open source software is the Linux operating system, but there are open source software products available for every conceivable purpose. Open source software is distributed under a variety of licensing terms, but almost all have two things in common: the software can be used without paying a license fee, and anyone can modify the software to add capabilities not envisaged by its originators.

Open Source software has gained a significant amount of strength for both consumer and business solutions. Firefox is one of the most popularly recognized open source applications that anyone that has ever surfed the Internet recognizes by name. The benefit of open source software is that unlike proprietary systems everyone has access to the software for distribution and improving it. Open source allows for thousands of people to contribute to the software and therefore creating a rich pool of ideas for the next version. It also establishes good security since it is always being utilized.

A few examples of popular proprietary systems are Apple's MacOSX, Microsoft Windows and UNIX. With the rise in popularity of computers among consumers, Windows and Apple were the only proprietary operating systems in the 1980s and 90s. However, after the divestiture of AT&T in 1984, (which freed Bell Labs from the legal glitch that inadvertently allowed anyone that requested a UNIX could obtain it similarly to the process for open source) it allowed Bell Labs to begin selling UNIX as a proprietary product. UNIX is a multi-tasking and multi-user operating system that was originally developed by Bell Labs in 1969. It was first developed in the Assembly Language, however, later it was "translated" and entirely recorded on C, which enabled it to port to hardware and allowed for further development. UNIX is considered a proprietary system; however, prior to the divestiture of AT&T, UNIX was more of an open source system since anyone that requested a license could obtain it by simply requesting it. Academic institutions and businesses very quickly adopted UNIX due to the flexibility it offered for early IT Solutions. As time passed UNIX would soon influence other proprietary operating systems in some way or another.

Strengths and Weaknesses

Proprietary software has overall been the dominant of the two when compared to open source. The concept of proprietary software is "let's keep it a secret so we can make money off of it. Proprietary software has the backing of a company for profit that employs software engineers that work on the code on a daily basis. The source-code of these applications is a closely guarded "company secret" by the firms that develop them. Generally, the two things that users are not allowed to do with proprietary software is making copies of the software and redistributing it, selling your license to someone else, and/or reverse engineering and infringing on any copyrights and patents that the code may contain. However, most source code does not come with the proprietary software in order to prevent hackers from cracking the program and stealing the source code. When you purchase software you are purchasing the right to use it not to own it. A disadvantage of proprietary software is that it may take some time for bugs to be fixed; however, they do get fixed.

Open source software's advantage is that it is made available under a GPL that allows one to make copies, distribute the software, and also improve it by developing patches for bugs and widgets that provide extra features. Some open source licenses either allow or require the user to make the source code available publicly while other licenses allow you to keep the source code private. Other advantages of open source are the low costs, the freedom to modify the software, open standards that support collaborative development, and freedom to upgrade as needed. The main disadvantages of open source is that it may be difficult to get support, some proprietary formats like MS-Word is widely used and other formats may be less acceptable for business.

Real World Applications

Proprietary software has hundreds of different applications in the real world. Microsoft has made most of its fortune on real world applications. From the famous Windows operating system to applications such as Excel, PowerPoint Presentation, Visio and Visual Studio. These select a few titles; they are (and many more) influencing the world on a daily basis. As we have slowly gone from a paper and progress driven environment to a digital process format of how we handle and analyze information, proprietary applications are influencing just about every aspect of our lives. From how we take inventory, to writing documents, some of these applications have so much versatility it has steam-lined the way companies function and generate more profits by implementing these tools into their environments. Not all proprietary software costs money. Microsoft's Internet Explorer is one example of a proprietary software title that the public can download for free. However, just because it is free it does not mean that the user will own the software as they will only own the right to use the software for free. Open source software also has its place in real world applications; Firefox is arguably the best Internet browser that is available for free and it is an open source software title. Firefox has proven to be more reliable than its rival Internet Explorer; however, Internet Explorer has made strides in order to keep up with its competitor. Ubuntu is a free Linux-based operating system that is quick and easy to use. 50% of Linux users have Ubuntu installed. Ubuntu also comes pre-loaded with other open source software that all focus on the usability aspect of open source software. Another popular tool is WordPress, which is the world's most popular blogging platform, used by a staggering 202 million websites. Conclusion so which one is best? While proprietary software laid most of the foundation for computing since the beginning, open source has proven to be just as useful and valuable as proprietary software has been. With advancements in communication technologies emerging everyday that allow us to communicate and share ideas with one another a lot easier and faster the environment that proprietary software has created for open source allows open

source to become very powerful and continue to advance and contribute to computing and software development.

2. Difference between open software and proprietary software

Open Software	Proprietary Software
Purchased with its source code	Purchased without its source code
User can get open software for free of charge	User must pay to get the proprietary software
Users can modify the software	Users cannot modify the software
Users can install software freely into any computer	Users must have a license from vendor before install into computer
No one is responsible to the software	Full support from vendor of anything happened to the software
Examples: Linux, OpenOffice.org etc	Examples: Windows 7/8, MS-Office etc

3. Word processing Software:

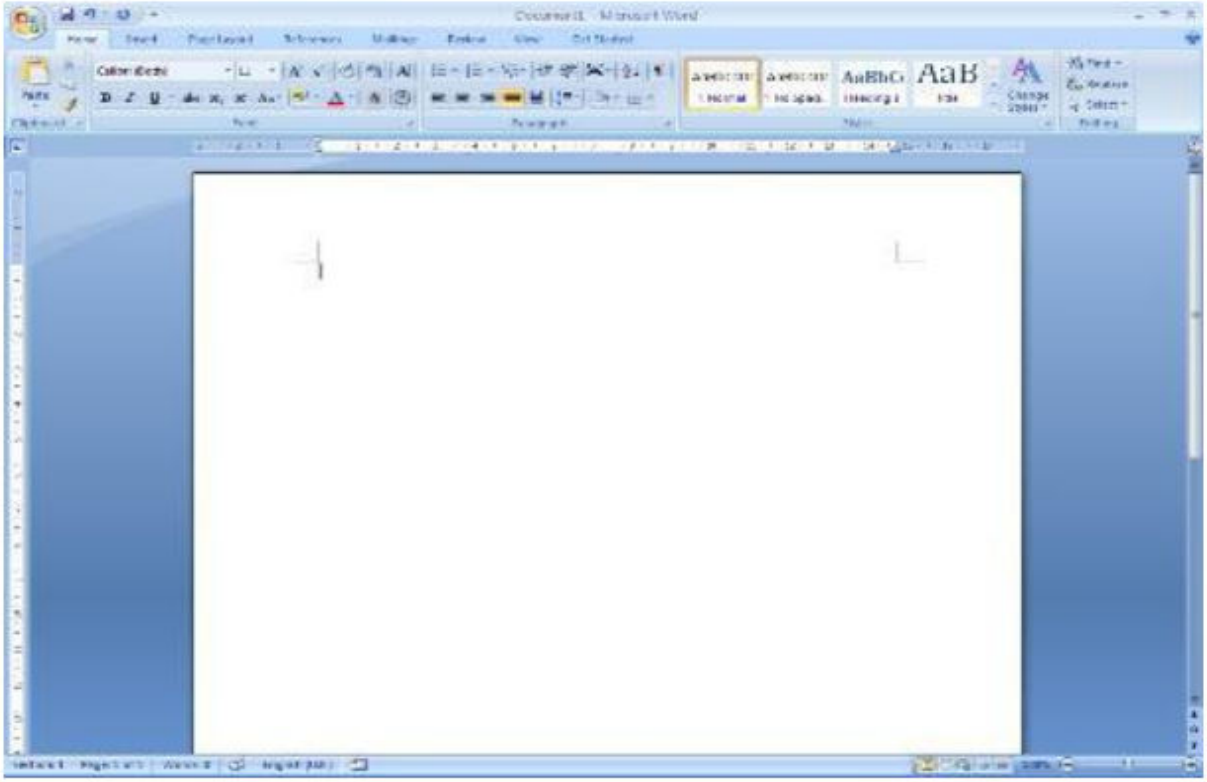
Using a computer to create, edit, and print documents. Of all computer applications, word processing is the most common. To perform word processing, you need a computer, a special program called a *word processor*, and a printer. A word processor enables you to create a document, store it electronically on a disk, display it on a screen, modify it by entering commands and characters from the keyboard, and print it on a printer. The most commonly used word processor available today is Microsoft Word, which we will discuss in the following section.

4. Microsoft Word

To load Microsoft Word:

1. Click on the Start menu in the bottom left corner of the screen
2. Choose All Programs then Microsoft Office (from the sub-menu which appears)
3. Finally click on Microsoft Office Word 2007

The window shown below will open, ready for you to begin typing.



Office Button 

In the top left-hand corner is the [Office] button which can be used to open and print your document. To the right of this is the Quick Access Toolbar which contains icons to a few commands, eg save and undo, and to which you can add further buttons. Below this is the Ribbon, with tabs along the top and command buttons on each tab. These can be used to give instructions to Word.

Scroll bars are provided on the right (and bottom) to let you move up and down (or sideways across) your work. At the very bottom of the window, there is information about where you are in your document on the Status Bar - here you are on Page 1. The information that is shown on the Status Bar is a word count and the language you're working in. On the right-hand side of the Status Bar are icons to change the view of the page, and to zoom in or out, ie make the text on the screen bigger or smaller.

Writing Your Document

You next need to decide how you want the rest of your text to appear. It's easiest to set this up before you start typing - the settings will then be carried forward from one paragraph to the next.

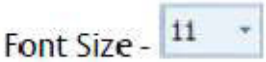
Changing Fonts

The starting font for a new document in Word 2007 is usually set to Calibri (Body). You might want to use a different style of lettering (font or typeface) to personalize your work. Several fonts are available in Word. If you want to change the current font:

1. Click on the list arrow attached to the [Font] button on the Home tab
2. Click on the font you require, eg Times New Roman – you can either scroll down the list to find the font you want, or type in the name of the font to pick it up more quickly

Some fonts (eg Symbol and Wingdings) produce non-Roman letters or iconic symbols. Courier New gives a typewriter font. Sans-serif fonts, such as Ariel, give clear headings.

Changing Font Size



Generally a point size of 10, 11 or 12 is used for the body of the text while point sizes of 13 to 16 are used for headings. The current size (11) is shown in the font size box. To alter this:

1. Click on the list arrow attached to the [Font Size] button on the Home tab
2. Click on the size you require - for example, 12

Entering Your Text

1. Type in a few words, pressing the <spacebar> once after each word to separate them (the spacebar is the long key along the bottom of the keyboard)

If you are not very fast at typing just type some imaginary words, pressing keys at random, but remember to include spaces between your words

2. Continue typing across the screen - the words will automatically spill onto a new line when you reach the right-hand side (this is known as wraparound)
3. Continue typing until you have at least three lines of words then press <Enter> to mark the end of the paragraph (this is the upside-down L-shaped key on the right of the main keyboard – it is also located on the far right of the keyboard, in the numeric keypad, with the word Enter written on it)

IMPORTANT: When using a word processor, do NOT press the <Enter> key at the end of each line. If you need your work double spaced (each line followed by a blank line) then you simply change the paragraph's line spacing - this is covered later on. Press <Enter> only when you want to start a new paragraph.

A jagged red (or occasionally green) line may appear beneath your text. Don't worry about this - Word is telling you that what you typed is not recognized (the words are not in the dictionary) or that the grammar may be incorrect. You learn more about this later.

4. Practice typing a couple of extra paragraphs, pressing <Enter> at the end of each.

Correcting Mistakes

Don't worry if you go wrong, as it is very easy to correct your work. The <Backspace> key (immediately above <Enter> in the main section of the keyboard) can be used to delete the last character(s) typed.

1. Press <Backspace> a few times and note what happens

You should have noticed a flashing vertical bar on the screen at the end of your work. This marks the insertion point. Anything that you type will always appear at the insertion point. You can move the insertion point around your work by using the arrow keys to the right of the main keyboard. You can also change its position by moving the mouse pointer on the screen and clicking where you want the insertion point to be.

2. Press the <arrow> keys to move the insertion point around - note that you can hold down a key to move more rapidly
3. Move the mouse to position the pointer in the middle of a paragraph and click on the mouse button - the insertion point should have moved to where you clicked
4. Type in some more words - watch how the text which follows moves sideways to make room for the new words

As the text moves, the following lines of the paragraph are redrawn automatically. Within a paragraph, the <Backspace> key works as before but you can also remove characters forwards:

5. Press the <Delete> key (immediately to the right of <Enter>) a few times and note what happens Here you are only practicing on text you do not need to keep, but you may accidentally delete words that you needed. Do not panic! If you ever make a mistake when using Word then you can undo your error by using the [Undo] button.

This can be found on the Quick Access Bar in the top left-hand corner. The undo button can be used more than once, to undo a series of actions, one at a time.

6. Click on the [Undo] button several times to see its effect

Note: There's also a [Redo] button (to the right of [Undo]) if you accidentally undo too much!

Aligning Text on the Page

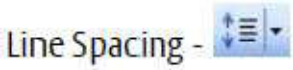
With Microsoft Word, it's easy to change the appearance of your work. Changes to the way a paragraph is laid out can be made by first moving the insertion point into that paragraph (anywhere will do). You can then decide how you want your paragraph to look.

1. Move the insertion point into the paragraph you want to change

When typing a document you normally want text to align on the left-hand side of the page. Some people prefer text to be fully justified - this is where text aligns both left and right. You can also align text to the right (eg for an address) or to the centre (eg for a title or heading). You can use the buttons shown above (they are on the Home tab in the Paragraph group) to control how text is aligned on the page.

2. Try out all four justification buttons (or use <Ctrl l>, <Ctrl e>, <Ctrl r> and <Ctrl j>) - note that only the current paragraph is affected; each paragraph has its own justification setting

Altering Line Spacing



Sometimes you might be asked to double space your work (or use some other spacing). You might even choose to have a quotation (for example) one-and-a-half spaced, with the rest of your text double spaced. You should still be in the paragraph where you tested the different justification settings.

1. Click on the list arrow attached to the [Line Spacing] button in the Paragraph group
2. Select 2.0 for double spacing

Changing the Look of Your Text

As well as changing the font and font size, you can make some other fairly simple formatting changes that change the look of your text. Here try out the bold, italic and underline buttons which are in the Font group on the Home tab.

1. Move to the bottom of your current document. A quick way to do this is to use the control key combination <Ctrl End> (the <End> key is located in the block of six keys to the right of the main keyboard letters). Press <Enter> until you’re on a new line

2. Click on the [Bold] button and type in some new words. You will find that these words appear in a blacker color. To turn off bold, click on the [Bold] button again

3. Try out the [Italic] and [Underline] buttons as in the above step

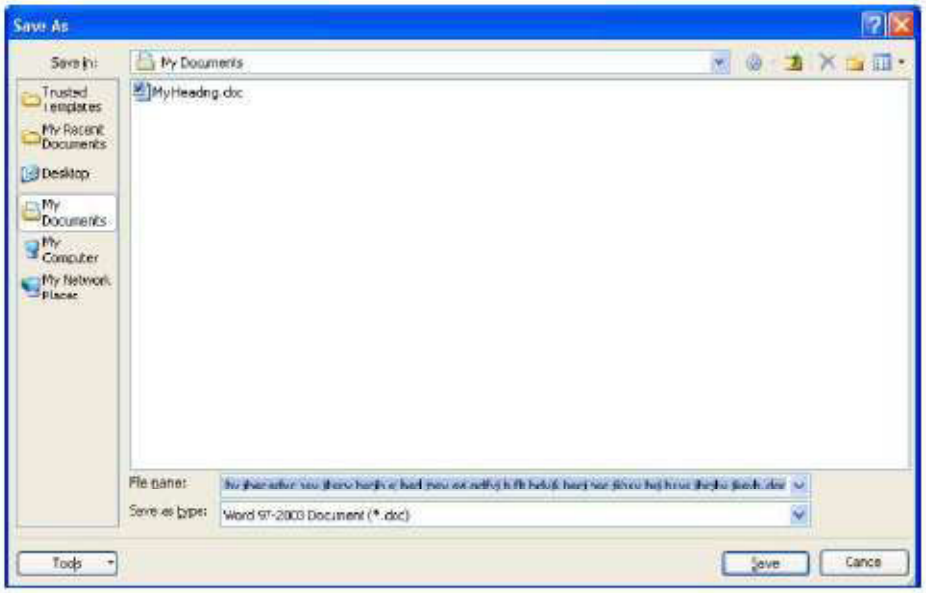
Note that you can have your text with more than one of these options set on - bold italic or underlined italic, for example. For emphasis, it is usually best to stick to bold. Italic is often used in the title of a paper or journal in bibliographies or references, and underline can be used for a heading or subheading.

Saving Your Work

You should save your work regularly - ideally every 10 minutes so that you don't lose what you have typed should the computer stop working. Word does have an auto-save facility which should guard against loss of work; however this is not a proper save and should not be relied on.

1. Click on the [Office] button in the top left-hand corner and then choose Save (or use the [Save] button on the Quick Access Toolbar)

For a new document, a Save As dialog box similar to that below will appear:



2. Type a name for your work (eg my first document) - there's no need to clear the File name; whatever you type will replace what's there already.

Note: you should mainly use letters and numbers for your file names (spaces, hyphens and underscores are also permitted); DO NOT use any other punctuation marks as they can cause problems.

3. Press <Enter> or click on [Save]

Once you have given your document a name, this will appear (instead of the original name, eg Document1) at the top of the Word window. Note that the extension .docx (or .doc for Word 2003 documents) is added automatically.

Working with Selected Text

Selecting text is very important as it identifies which section of text you want Word to modify. It can be used to change how some text looks, to move or copy text within a document, between documents or between different applications (eg Word and PowerPoint), and to delete or replace text.

A simple way to select part of your text is by dragging through it as follows:

1. Move the mouse so that the pointer on the screen is at the start of the text that you want to change
2. Hold down the mouse button, and keep it held down
3. Drag the mouse sideways to move the pointer to the end of the text that you would like to change – the selected text now has a blue background
4. When you are happy with your selection, release the mouse button

You may have noticed that a set of option buttons have appeared just to the right of your selected text like in the example below:

These different buttons immediately allow you to change the look of the selected text, eg make it bold, alter the font or size, turn it into a list etc.

If you accidentally go wrong and select the wrong text, click the mouse once (this will release the selection) and try again.

Rows of text can be selected using the <down arrow> or <up arrow> keys.

Selecting the Text

Selecting can be done in several different ways, depending on how much text is involved. Any selected text can be de-selected by clicking on the mouse button once.

Try out the following:

- A single word - point to it using the mouse then double click on the mouse button - your selected word should be highlighted. Click once on the mouse to de-select it
- A single line - position the mouse pointer in the left-hand margin (where its shape changes to an arrow pointing inwards) and click once
- A whole paragraph - either double click in the left margin or click three times within the text
- The whole document - either click three times in the left margin or press <Ctrl a>
- A sentence - hold down <Ctrl> and click anywhere within the sentence
- A short piece of text - drag through the text to be selected

- A long piece of text - click at the start of the text to be selected then move down, using the scrollbars, and hold down <Shift> as you click at the end of the selection
- To modify an existing selection - hold down <Shift> and use the arrow keys

Cut, Copy and Paste

The above buttons are visible on the far left of the Home tab in the Clipboard group.

Moving text around a document is done by:

i. Selecting it

ii. Cutting or copying it from its present position

iii. Pasting it back to its new one

You can copy information within the same document, from one document to another, or from one program to another (for example, text on a web page can be copied into your Word document).

1. Move to the top of your document (pressing <Ctrl Home> takes you straight there) and select the first paragraph of text (double click at the left or three times within the paragraph)

2. Click on the [Cut] button and the paragraph will disappear - do not be alarmed, it has not been lost, but has been copied onto the clipboard

3. Move the insertion point down to the end of your text (pressing <Ctrl End> moves you straight there)

– add a new line if necessary by pressing <Enter>

4. Click on the [Paste] button - your original paragraph will be pasted into its new position

Note: You can also use right click on selected text and choose Cut or Copy from the shortcut menu, then move to the new position and finally right click there and choose Paste from the shortcut menu.

Note also the [Format Painter] button. This is used to copy the format (font and/or paragraph settings) from one piece of text to another:

5. Select the text (or paragraph) whose format you wish to copy - try the text you made bold earlier

6. Click on the [Format Painter] button (the pointer becomes a paintbrush)

7. Drag through another piece of text - release the mouse button and it too becomes bold

This can be especially useful in the case where you notice that a paragraph looks different from the rest of the paragraphs on that page, maybe because it is in a

different font. You can use the [Format Painter] button to quickly correct this problem.

Making Multiple Copies and the Clipboard

When making multiple copies of text, you normally Copy rather than Cut it to the clipboard:

1. Select some text (a few words will do) and click on the [Copy] button (or press <Ctrl c> or right click and choose Copy)
2. Your original text will remain where it is, but a copy of it has been placed on the clipboard
3. Move the insertion point to where you want to paste the text
4. Click on the [Paste] button (or press <Ctrl v> or right click and choose Paste)
5. Repeat the above step and a second copy of the text will appear

The clipboard, which is normally hidden, will only store the last item that you cut or copied but, after displaying it, up to 24 items can be stored on it. To display the clipboard:

6. Click on the Clipboard group arrow  just below the [Format Painter] button – this will open the Office Clipboard in a Task Pane on the left
7. Select another part of your text and [Copy] it - watch it appear on the clipboard
8. Move the insertion point then click on the new clipboard entry to paste it into your text
9. Repeat the above step but click on the original clipboard entry

You won't need to paste any of the text again, so it's a good idea to empty the clipboard:

10. Click on the [Clear All] button in the Clipboard pane
11. Close the Task Pane by clicking on its [Close] button (the little x in the top right corner)

Drag and Drop

If you wish to move text a short way then you can use the drag and drop technique:

1. Select some text - a few words is sufficient
2. Move the mouse pointer into the highlighted area then hold down the mouse button (the pointer becomes an arrow with a box attached and in the left-hand corner of the Status Bar at the bottom of your Word window it says Move to where?)
3. Keeping the mouse button held down, drag the text to a new place in your document (as you move the cursor a faint dotted line appears - this is where the selected text will be dropped)
4. Release the button - the text will be moved to its new position
5. Practice moving selected text to other positions

Further Formatting

Most of your text will be with the same layout of paragraphs. However, sometimes you will need to change the layout for other special sections (eg for a list).

Bulleted and Numbered Lists

It is often useful to create lists using either bullets or numbers. The [Bullets] button gives you a bulleted list:

1. Move to the end of the text (press <Ctrl End>) and make sure you are on a blank line
2. Click on the [Bullets] button (on the Home tab in the Paragraph group) – a bullet point should appear
3. Type a couple of words against each bullet point, pressing <Enter> once after each one
4. Press <Enter> twice at the end to turn the bullets off

Numbers are applied in a similar fashion using the [Numbering] button:

5. Click on the [Numbering] button - a number 1. appears
6. Type in two short paragraphs (one a couple of lines long), pressing <Enter> once after each one

Note that each paragraph is numbered and that the first line of text is indented slightly to allow for the number. The second line of text is also indented, to line up with the words of the first line.

7. Move to the end of the paragraph numbered 1 and press <Enter> - a new number will be inserted in the correct sequence with later lines re-numbered
8. Press <Tab> (the button to the left of the letter Q) and the numbering changes to a and is indented further – type a few characters
9. Press <Enter> (the letter b appears) then <Shift Tab> (the letter changes to the number 2)
10. Press <Delete> and the extra line will disappear
11. Move to the last line in the numbered list (which should be empty) and press <Enter> - this should turn numbering off

Correcting Spelling and Grammar

Word checks the spelling and grammar as you type. A red squiggly line under a word denotes that Word thinks it has been spelt incorrectly; if the line is green then the grammar may be incorrect. You can check the whole or part of the text for mistakes using the [Spelling and Grammar] button.

1. Press <Ctrl End> to move to the end of your text then <Enter> for a new line

2. Type the following miss-pelt text:

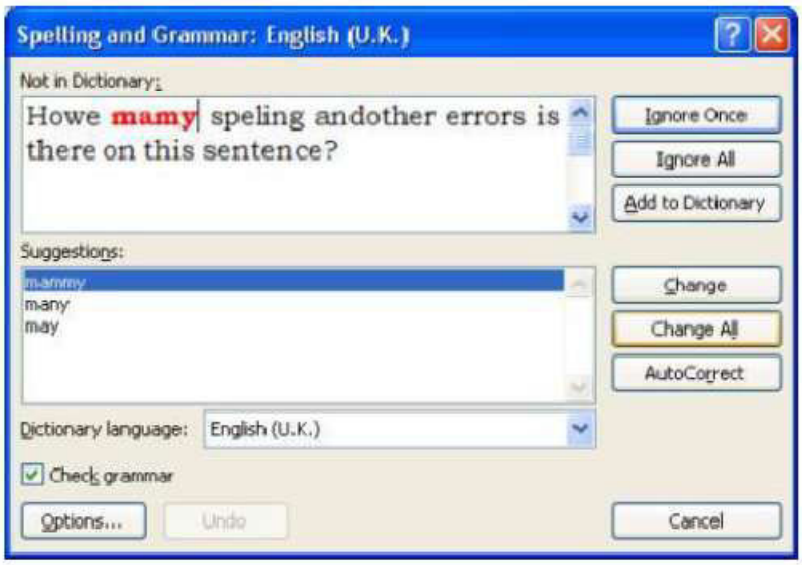
howe mamy speling andother erors is there on thsi sentance? There was 10.

Note that as you type the words, Word automatically corrects certain mistakes:

- it capitalizes the first word in a sentence (Howe)
- it corrects certain misspellings (eg erors to errors, thsi to this and sentance to sentence)

3. Select the line of miss-pelt text (eg click 3 times on it) - Word can spell-check just a selected area

4. Move to the Review tab and click on the [Spelling and Grammar] button on the left of the Ribbon



5. Choose the correct spelling of many in the Suggestions: box – press <Enter> for [Change]

6. Continue in the same manner with the other corrections

7. Always check the correction is what you want - with and other choose and other

If Word gives you no suggestions (or doesn't show the correct one in the list) you can edit the text in the Not in Dictionary: box. Also if a spelling is correct but 006Eot in the dictionary, you can either choose to [Ignore] a suggested correction or [Add] the word to your own dictionary. Choose [Ignore All] if you don't want to be asked about the same spelling again (similarly [Change All] will change all occurrences of a miss-pelt word).

You can also [Close] or [Cancel] the check at any time.

Once the spelling check is complete, the grammar checker is run. This isn't foolproof, but it does pick up some common grammatical mistakes. At the end of the grammar checks:

8. Click on [No] - you don't want the rest of the document checked

9. Press <End> to deselect the highlighted text then <Enter> to start a new paragraph

Closing a Document

Although you can have more than one document open in Word, if you have finished working on a file, it is a good idea to close it. Before closing it, remember to save it:

1. First press <**Ctrl s>**

2. Click on the **[Office]** button in the top left-hand corner and then choose **[Close]**

Opening an Existing Document

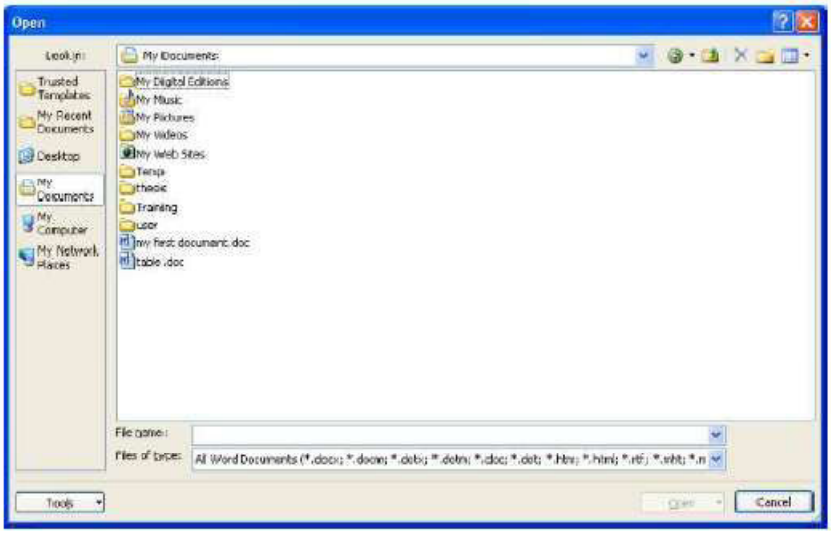
You may want to do some further work on an existing document. In this next exercise you will be opening the file you have just closed.

1. Click on the **[Office]** button and choose **Open**

Note the list of *Recent Documents* on the right-hand side – from here you can open up your latest documents and can pin documents permanently to the list. The **[Open]** button on the *Quick Access Toolbar* (or the key combination **<Ctrl o>**) can be used to open a file but you then don't see the list of *Recent Documents*.

You will see a dialog box similar to the following, showing any folders and Word files in *My Documents*:

2. Click on the name of your file you want to work on, eg **my first document.docx**



3. Press **<Enter>** or click on **[Open]**

Use the **<Page Down>** key (above the arrow keys) to move down your document or **<Ctrl End>** to go to the end of your document.

Note: You can have more than one document open at a time in Microsoft Word. This allows you to copy text from one document to another. You can move between documents by clicking on the **View** tab and then the **[Switch Windows]** button (or the buttons on the *Taskbar*, normally located at the bottom of your screen).

Starting a New Document

To start a new empty document at any time from within Word:

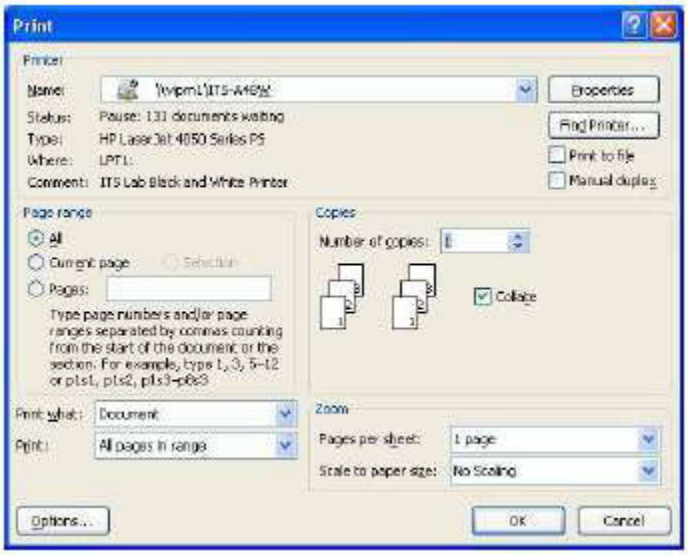
1. Click on the **[Office]** button and choose **New**

2. A **New Document** window will open – the **Blank document** icon will already be selected so just click on **[Create]**

If you use the **[New]** button on the *Quick Access Toolbar* (or the key combination **<Ctrl n>**) then the new document appears immediately.

Printing

1. Click on the **[Office]** button and choose **Print** button (or click on the **[Print]** button on the *Quick Access Toolbar* or use the keyboard combination **<Ctrl p>**) – the following window appears:

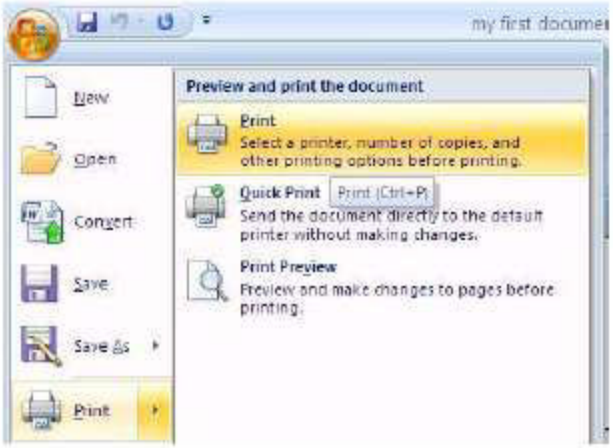


2. Set the required *Page range* and *Number of copies:*

3. The final step would normally be to click on **[OK]** but here, click on **[Cancel]**

It's a good idea to preview your work to check it fits neatly on the page before you print it. To do this:

4. Click on the **[Office]** button then move the mouse cursor over **Print** – a sub-menu appears:



5. From the further options that appear, choose **Print Preview**

6. Click on **[Close print Preview]** on the far right of the new *Print Preview* tab to return to normal typing

Using Help

Microsoft Word has its own built-in help system. This can be accessed by clicking on the **[Help]** button on the far right of the Word window (just under the **x** to close Word). If you get used to using help then you should be able to solve your own problems.

To demonstrate how the system works, look up how to make your text bold:

1. Click on the **[Help]** button – a *Word Help* window appears

2. Type the word **bold** into the *Search help* box and press **<Enter>** - a list of topics should appear

3. Click on the topic **Make the text bold**

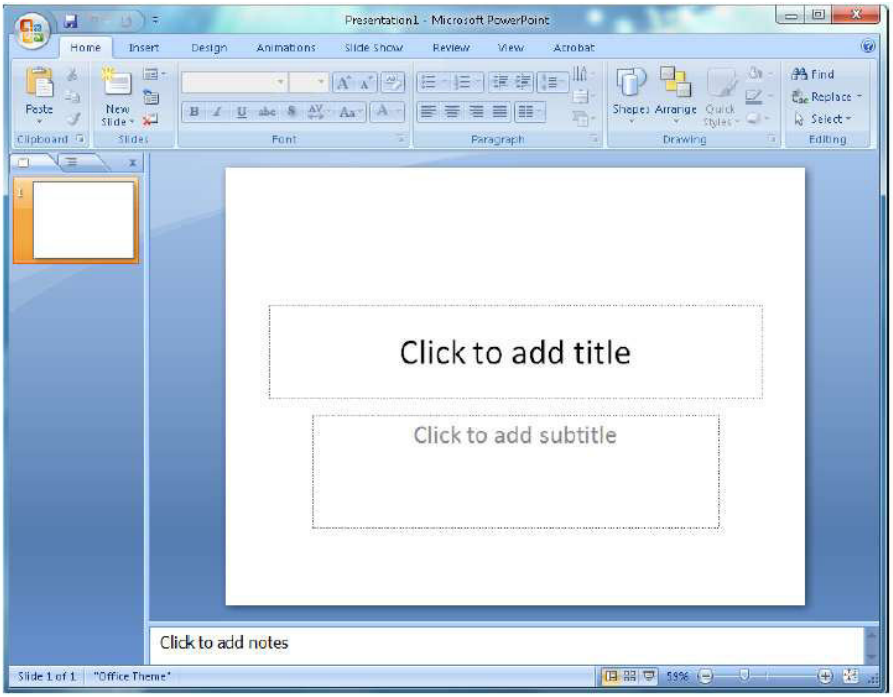
5. Presentation Software

A **presentation program** is a software package used to display information in the form of a slide show. It has three major functions: an editor that allows text to be inserted and formatted, a method for inserting and manipulating graphic images, and a slide-show system to display the content. The most commonly used presentation software is MS-PowerPoint, which we will discuss in this section.

6. Microsoft PowerPoint

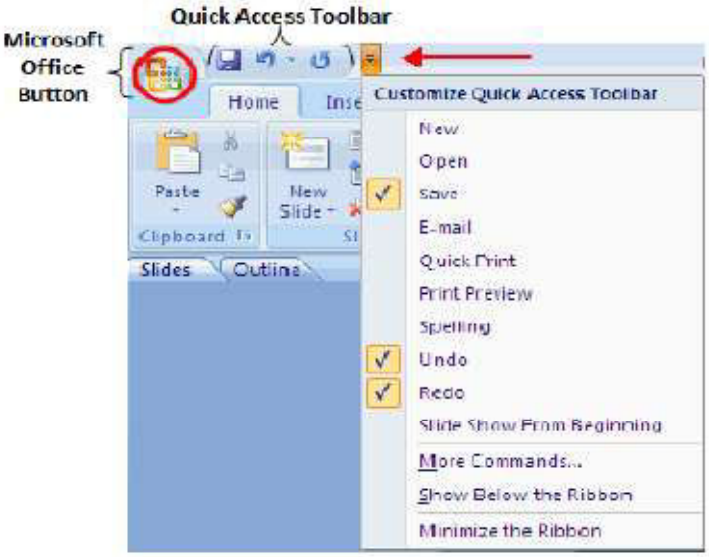
PowerPoint is a presentation software package. PowerPoint presentation consists of a number of individual pages or "slides." Slides may contain text, graphics, tables, movies, etc. The presentation can be printed, displayed on a computer, and can be

projected using a video projector. PowerPoint can add animation to your texts, graphics, tables, movies, and other objects through Custom Animations.
You can also add transition (movement) between your slides.



PowerPoint 2007 has a new, intuitive user interface called the Microsoft Office Fluent User Interface, which helps you create better presentations quicker. Additionally, PowerPoint 2007 offers new and improved effects, themes, and layouts.

Microsoft Office Button & Quick Access Toolbar



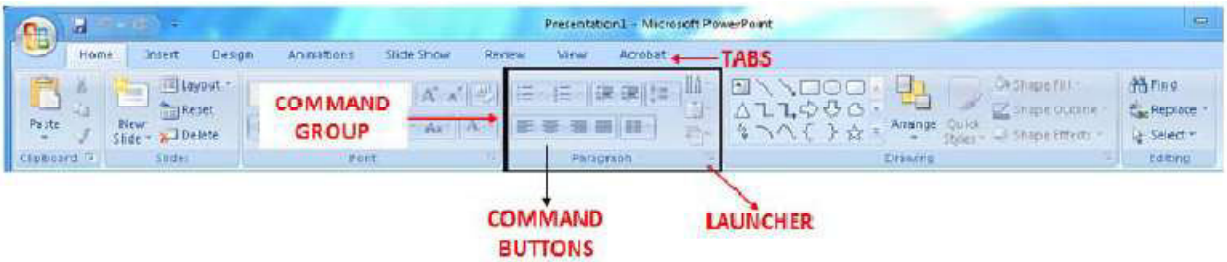
Microsoft Office Button

In the upper-left corner is the Microsoft Office button. When you click the button, a menu appears. You can use the menu to create a new file, open your existing file, save a file, and print a file.

Quick Access Toolbar

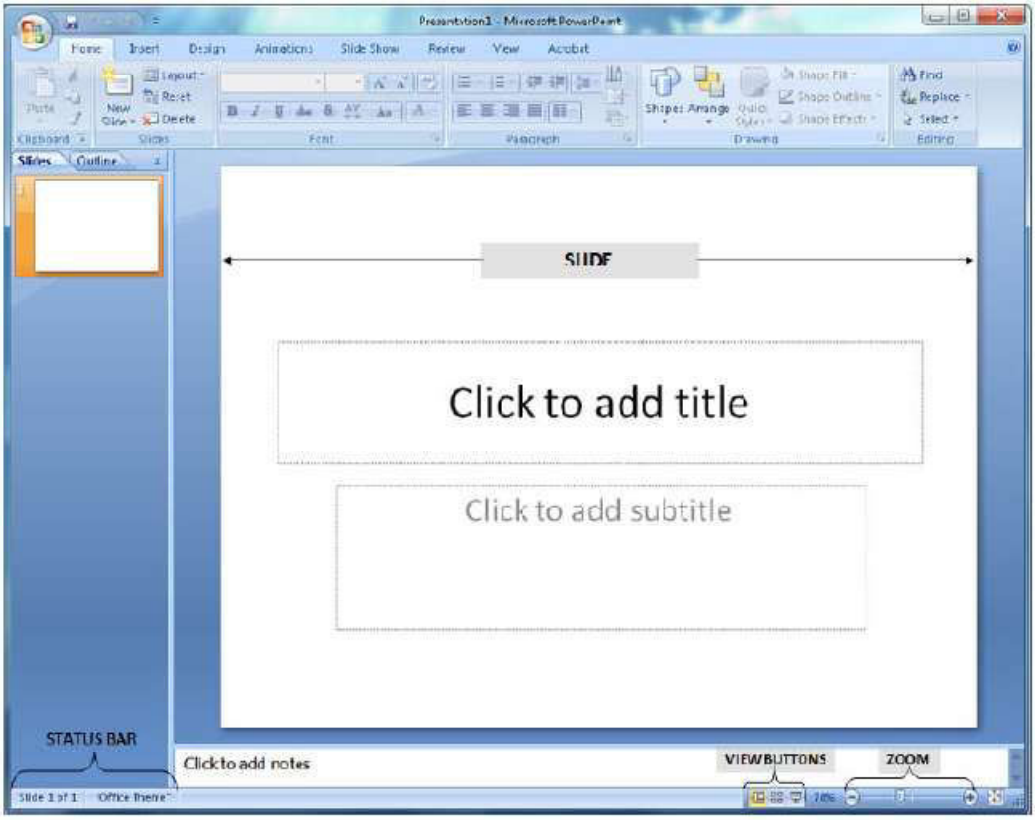
Next to the Microsoft Office button is the Quick Access toolbar. The quick access toolbar is a customizable toolbar that contains commands

The Ribbon



You can use the commands to tell PowerPoint what to do. The Ribbon is located at the top of the Powerpoint Window. At the top of the Ribbon there are several tables; clicking a table displaces several related group commands. You can click on the command buttons to issue commands or to access menus.

PowerPoint Window



STATUS BAR: Appears at the bottom of the window. The status bar displays the slide number that is currently displayed and also the total number of slides.

OUTLINE/SLIDES TABS: Displays the text contained in your presentation. The slides tab displays a thumbnail of all your slides.

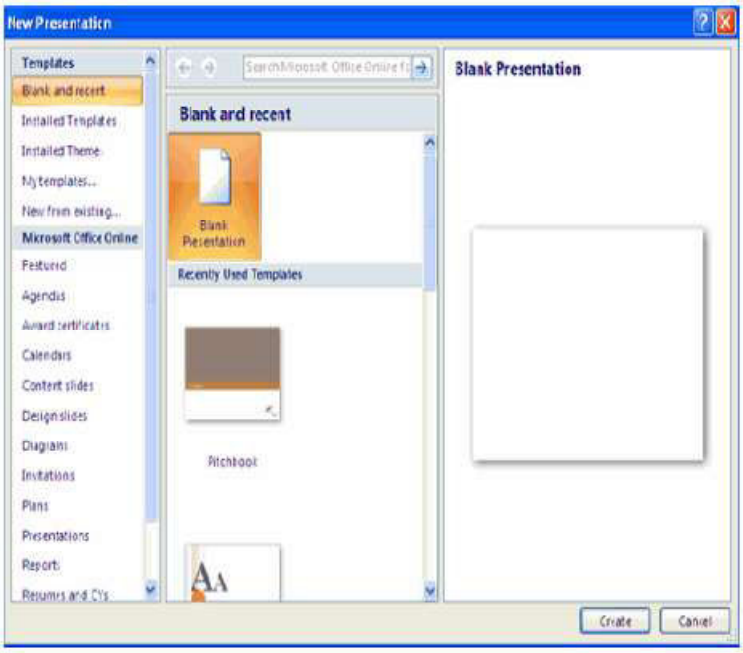
NORMAL VIEW SLIDE SORTER VIEW SLIDE SHOW	Splits your screen into three major sections: slides/outline tabs, the slide pane, and the note area. The outline and slides tab are on your left side of your window. They allow you to shift between different ways of viewing your slides. This view shows you the thumbnails of all your slides and allows you to easily add, delete, or change the order of your slides. Use the slide show view when you want to view your slides as they will look in your final

	presentation.

Saving Your Work

Saving for the First Time (Save your work frequently by saving it to a flash drive, e-mail it to yourself, or use FTP to save a copy of your PowerPoint Presentation). Click **Microsoft Office Button** Click Save **Renaming and Saving as an Earlier Version of PowerPoint** Click **Microsoft Office Button** Click **Save As** Type in a Name for your presentation In the **Save as Type** box, choose PowerPoint 97-2003.	

Blank Presentation

Click the **Microsoft Office Button** **Click New** **Click Blank Presentation**	

Add Slides

Office Themes

Select the slide immediately before where you want the new slide.

Click the **New Slide** button on the **Home** tab.

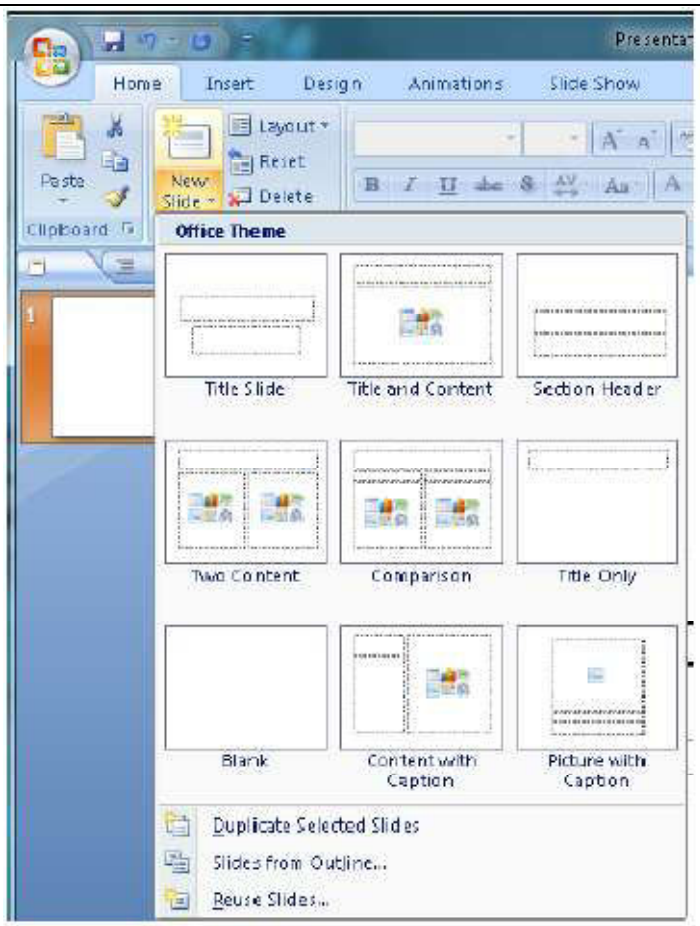
Click the slide choice that fits your material.

Duplicate Selected Slides

Select the slide to duplicate.

Click the **New Slide** button on the **Home** tab.

Click **Duplicate Selected Slides**.



Theme

Themes are designed that can be applied to an entire presentation that allows for consistency throughout the presentation. You can also apply new colors to a theme.

Themes

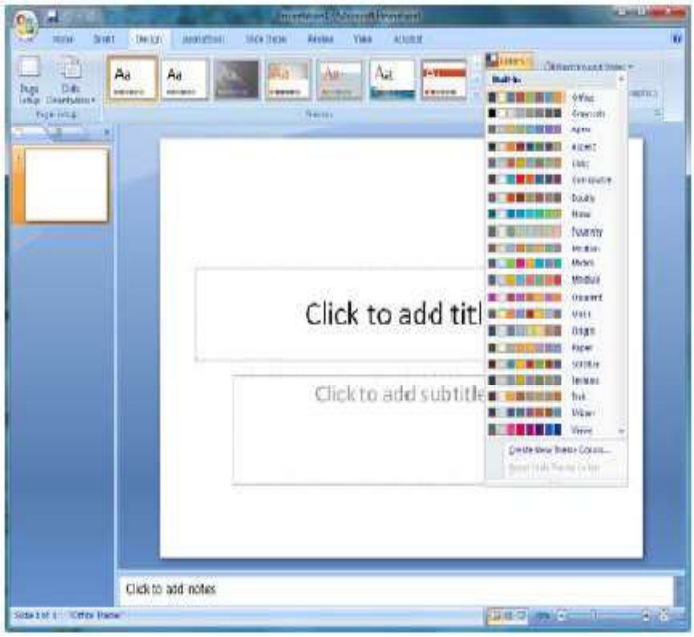
- Click the **Design** tab.
- Choose one of the displayed **Themes.**

Apply Colors Themes

- Click the Colors drop down arrow.
- Choose a color set or click Create New Theme Color.

Background Theme

- Click the **Background Styles** button on the **Design** tab.



Adding Video and Audio

Adding video clips

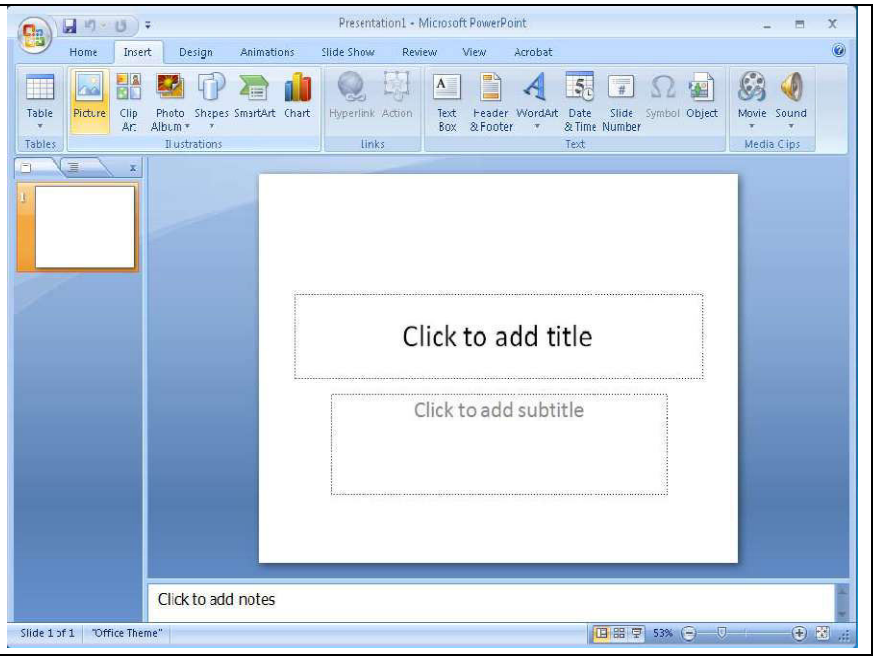
- Click the **Movies** button on the **Insert** tab.
- Choose **Movies from File** or **Movie from Clip Organizer.**

Adding Audio

- Click the **Audio** button on the **Insert** tab.
- Choose **Sound from File, Sound from Clip Organizer, Play CD Audio Tract,** or **Record Sound.**

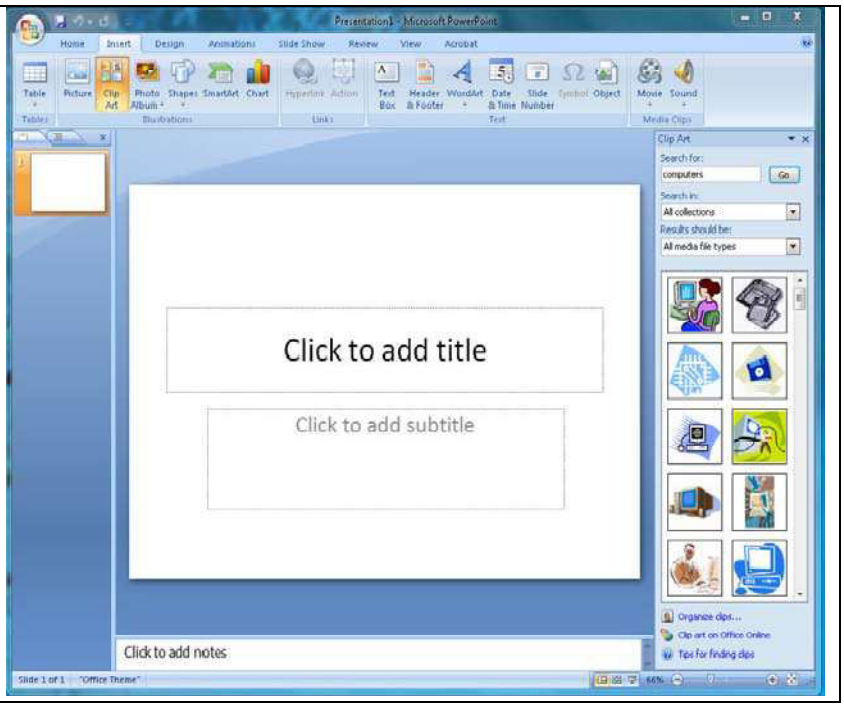
Adding Pictures

To add a picture:
- Click on the **Insert** tab.
- Click on the **Picture** button.
- Browse to the picture from your files
- Select the picture you want to insert in PowerPoint
- Click **Insert**.



Add Clip Art

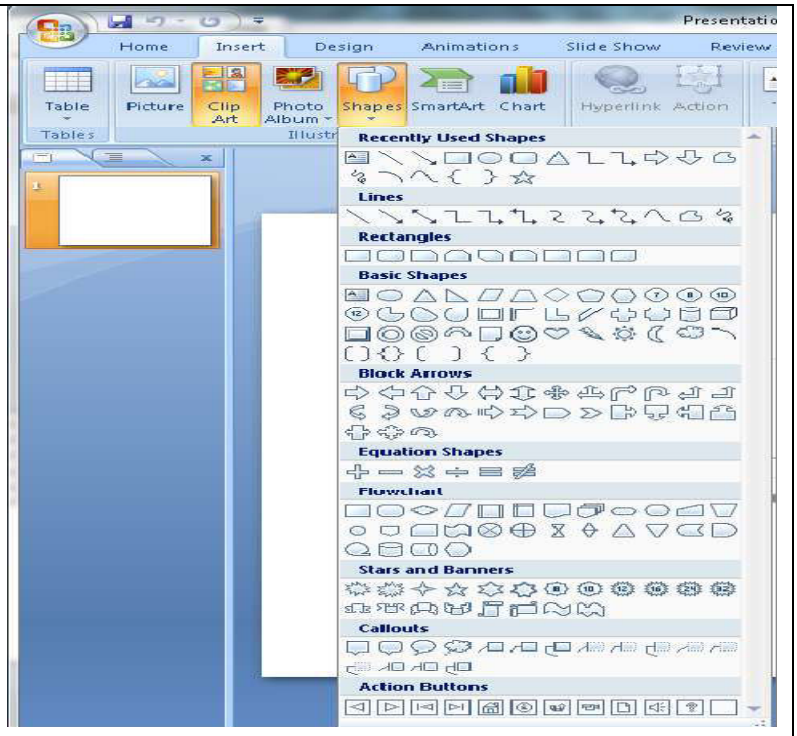
To add clip art:
- Click the **Insert** Tab.
- Click the **Clip Art** button.
- Search for the clip art using the search Clips Art dialog box.
- Select the graphic you would like to add.
- To move the graphic, click it and drag it to where you want it.



Add Shape

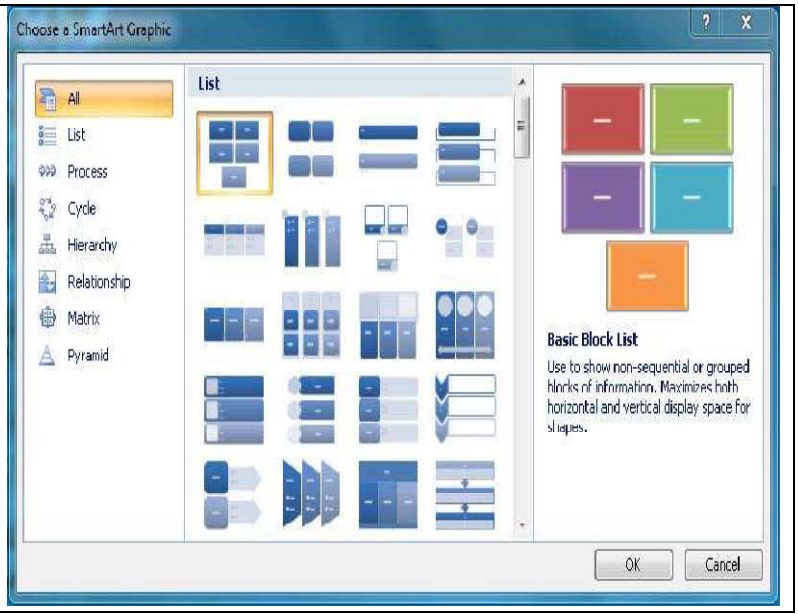
To add Shapes:
- Click the **Insert** tab.
- Click the **Shapes** button.
- Click the shape you choose.

How to Format the Shapes:
- Click on your shape (object).
- Click the **Format** tab.

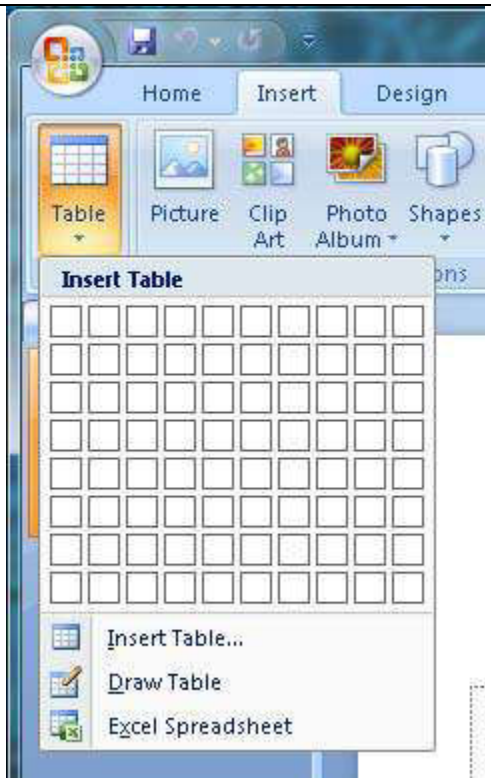


Add SmartArt

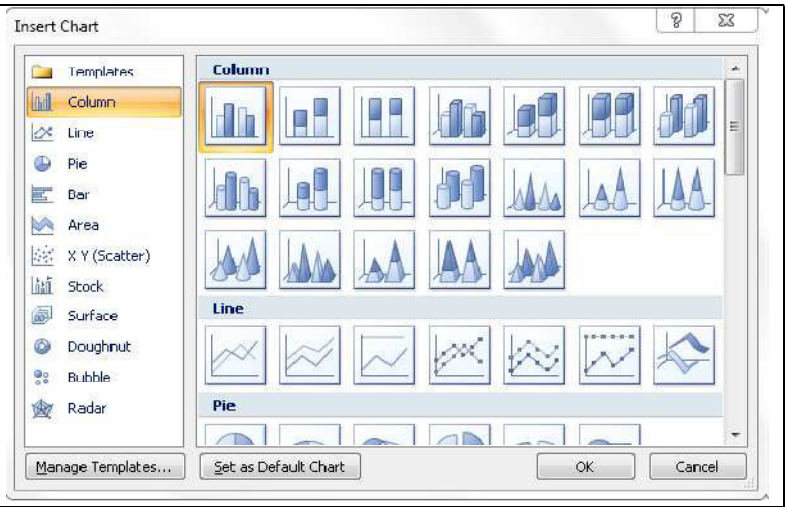
To add SmartArt:
- Click The **Insert** tab.
- Click the **SmartArt** button.
- Click the **StartArt** you choose.
- Drag it to the desired location in the slide



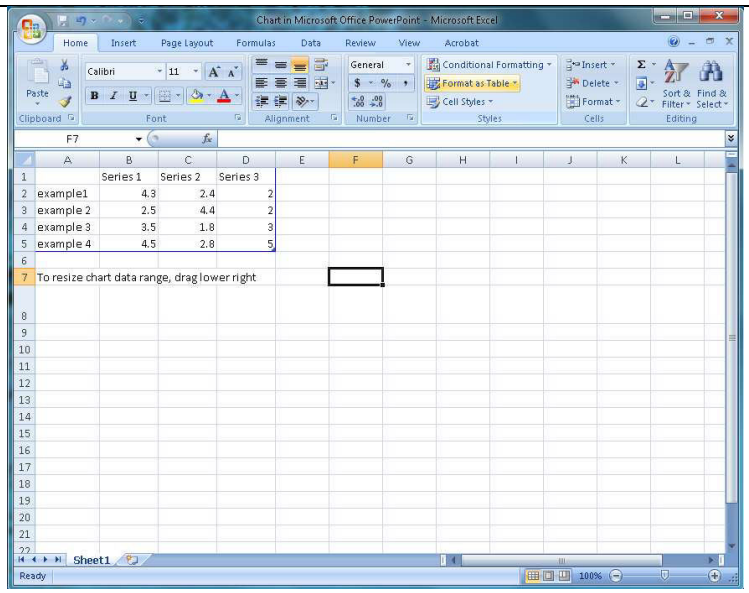
Create a Table

To create a table: - Place the cursor on the page where you want the new table. - Click on the **Insert** tab of the ribbon. - Click on **Tables**, and enter the number of rows and columns. - Place the cursor in the cell where you wish to enter information and begin typing. - Click on your table and then the **Design** tab to customize your tables.	

Create a Chart

To insert a chart: - Click the **Insert** tab. - Click the type of **Chart** you want to create. - Insert the **Data** and **Labels.**	
Edit Chart Data:	

- Click on the chart
- Click **Edit Data** on the Design tab.
- Edit data in the spreadsheet.



SLIDE TRANSITION

Slide Transitions are effects that are in place when you switch from one slide to the next.

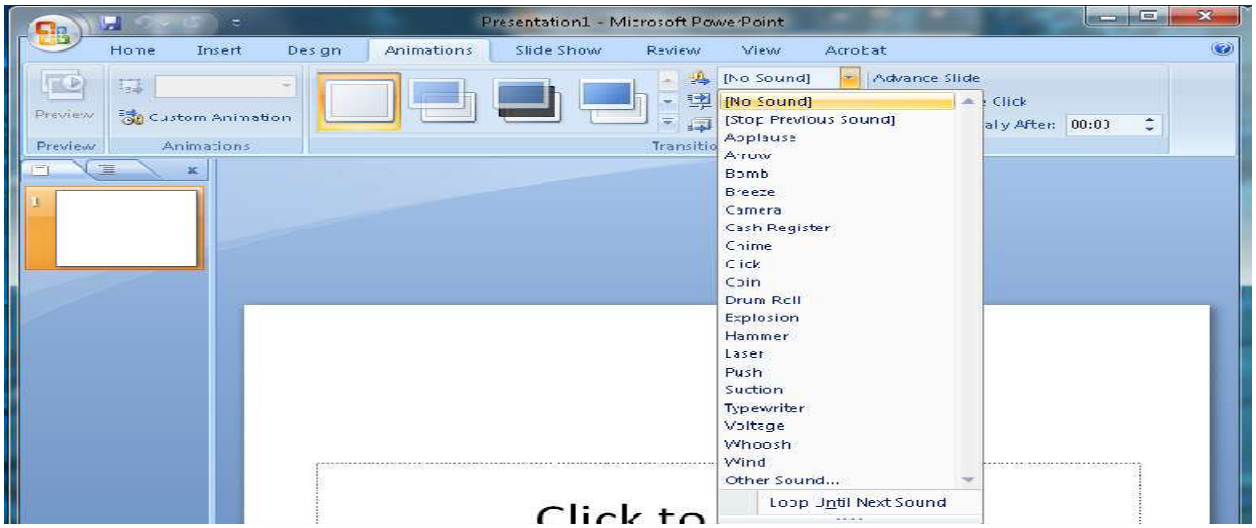
1. **To add slide transitions:**

   - Select the slide that you want to transition.
   - Click the **Animations** tab.

   Choose the appropriate animation or click **Transition** dialog box.

2. **To add Transition Sound:**

   Add sound by clicking the arrow next to **Transition Sound**.



3. To modify transition speed:

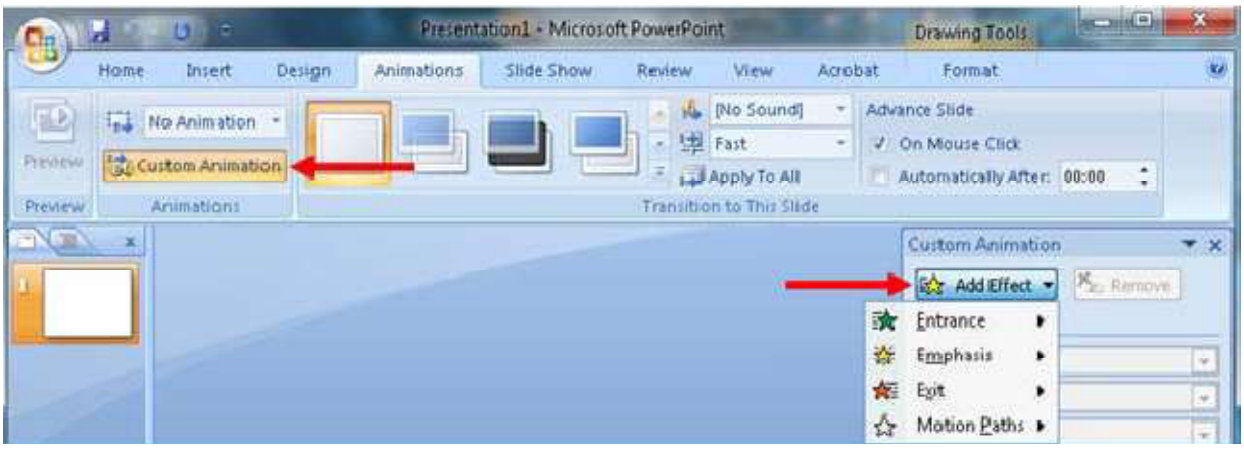
Modify the transition speed by clicking the arrow next to **Transition Speed**.

SLIDE ANIMATION

Slide animations are special effects that you can add to objects on a slide.

1. **To apply animation effects**:

- Select the object you want to animate.
- Click the **Animation** tab on the Ribbon.
- Click **Add Effect**.
- Choose the effect you want on your object.



2. **To preview the animation on a slide**:

- Click the **Preview** button on the **Animation** tab.

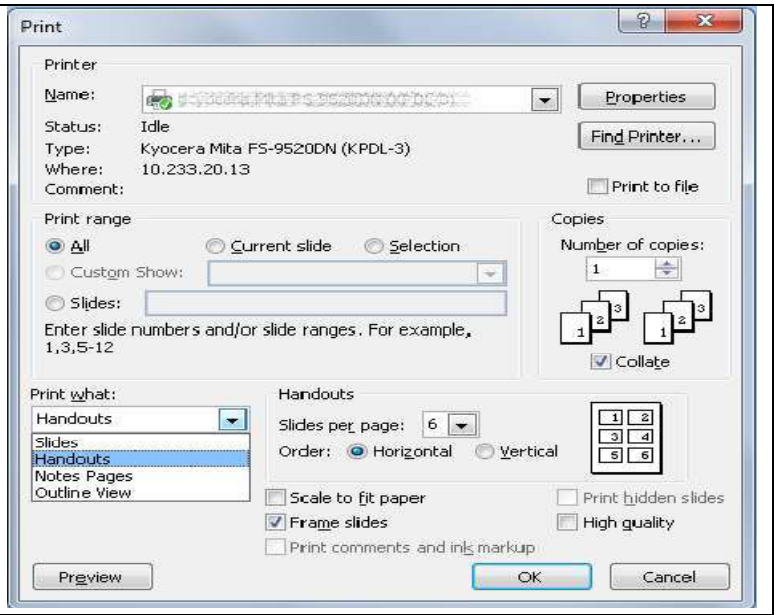
3. **Slide Show Options**:

- Preview the slide show from the beginning.
- Preview the slide show from current slide.
- Set up slide show.

PRINTING

To print:

- Click **Microsoft Office Button.**
- Click **Print**



LESSON NO. 2.4 | **AUTHOR : Dr. JASMER SINGH**

DIGITAL, VIRTUAL AND HYBRID LIBRARIES : DEFINITIONS, SCOPE, RECENT DEVELOPMENT AND TRENDS

Structure

10.0 Objective

The study of this lesson will help to understand various forms of electronic Libraries such as Digital, Virtual and Hybrid. It will also help to understand various aspects related to these Libraries.

10.1 Introduction

Traditional Library is a place where the document resources are organized geographically at one place and the users go there to access these resources. Today's technology gives us the ability to move beyond traditional library and access the current information through Internet including audio-visual presentation. As we move from the industrial to the information age, we have the capability to overcome barriers previously presented by time, geographical limitations and print dependency. It is a challenge for us as librarians and information scientists to cope with the present wave.

Library Users expect the library to develop capabilities in the collection, storage, preservation and use of digital media if it is to retain its core role as a key resources for scholarship, research and innovation. Library success or effectiveness depends upon producing virtual products high in added value, rich in variety, and available instantly in response to user needs. At the heart of this revolution is fast new information technology, increased emphasis on quality accelerated product or service development, changing service environment and manpower, and new linkages between library, suppliers and users. As librarians, digital media gives us dreams fulfilled with vast and powerful tools for optimum management and integrated presentation of information. The benefits of these technology are compelling. Digital media can be fully indexed, both for content and context and can be instantly linked to other digital media of similar or associated subject matter. It can be searched, abstracted or ordered on any number of user defined parameters and stored in a manner that will not degrade with use or time. Networked digital media moves beyond the present barriers of the physical production of information and makes current, comprehensive information delivery a literal possibility.

Digital library, electronic library or virtual library, facilitates access to electronic information, print materials, and library services to ensure that the information needs of users are met regardless of their location. It enables libraries to deliver valuable information that already exists within library wall electronically to patrons outside those walls, to create new digital resources locally, and to integrate local digital resources with remote ones.

10.2 Digital Library

10.2.1 The Concept

A digital library is a library in which a significant proportion of the resources are available in machine readable format accessible by means of computers. The

digital content may be locally held or accessed remotely via computer networks. In libraries, the process of digitization began with the catalog, moved to periodical indexes and abstracting services, then to periodicals and large reference works, and finally to book publishing, some of the largest and most successful digital libraries are Project Gutenberg, ibiblio and the internet archive.

Digital Library is the outcome of the prolonged research and development in the field which is more pertinent to the electronic collections and its management of identification, micro and macro evaluation, selection, acquisition, resource sharing and document delivery. There is no homogeneous and globally accepted definition of a digital library. However, the electronic collections of information and record of the same through on-line and offline and also through various digitized collections such as CD-ROM, Floppy etc. relate to the existence of digital library in broad sense of the term.

Digital library is parallel to or at par with the electronic library and virtual library. The Library which provides collections and services in the electronic form through video disks, CD-ROM can be termed as electronic library; the library which provides electronic collections and/or services can be understood as digital library; and the library which, without any physical existence is concerned with web site is known as virtual library (Rajashekar 1998; p. 2). The digital library in the 21st century has become a vehicle for managing knowledge and information in a digital format which allows for interactive user interfaces and supports teaching, research and life long learning (Lupone;2000;p.30). Thus, the digital library, which is available in electronic form and is not virtually present in shape of marble edifice; is transforming access to information. According to William Saffady, The digital library concept can be pertained to the following areas (Matson; 19910; p.88).

a. Machine-readable data files, often with scientific and technical application;
b. Components of the emerging National Information Infrastructure;
c. Various on line databases and CD-ROM information products;
d. Computer storage devices on which information reside, such as optical disk, jukeboxes or magnetic tape autoloaders; and
e. Computerized networked library systems.

10.2.2 Scope

The Digital Libraries available in various forms are restricted not only to the size of files and the format contents which are available in a structured form of software on CD-ROM including video clips, full length movies, but also extend its jurisdiction to rapid communication, Boolean search, browsing of information on Internet through World Wide Web.

10.2.3 Definition

According to A.N. Yorkey (1966) "The digital libraries are electronic libraries

having large and diverse repositories of electronic objects. The digital objects include text, images, maps, sounds, videos, catalogues and indices, business and government databases as well as hypertext, hypermedia and multimedia compositions". The end users link to many digital libraries and information centres in a transparent form through the modern technologies. Further, the digital libraries provide a homogeneous presentation of a good number of repositories and allow the end users to comfortably connect and interact with information with regard to geographical location or time.

The collection of information, image, graphics, etc. in a digital library without any geographical circumscribe are disseminated all in digitized form through internet which are accessed by the Network service Provider and millions of users connect their PCs through Digital Collections Services (DCS) using Local Area Network (LAN) technology to get a transformed, authentic, pin-pointed information.

Digital library in its broad sense is a collection of information of library resources in digital format. Dwyer (19910) quote that digital library that maintains all, or a substantial part of its collection in computer format as an alternative or complicated to the traditional printed documents. Gladney et al (19940 using slightly complicated words express that "A Digital Library is an assemblage of digital computing, storage and communications machinery together with the content and software needed to reproduce, emulate, and extend the services provided by the conventional libraries based on paper and other material means of collecting cataloguing, finding and dissemination information," Association of Research Libraries (ARL, 1999), Washington While defining digital library noted that 'digital library', 'electronic library' or 'virtual library' are often used synonymously. A common thread to bind the terminology used to definitions is an emphasis on resources and technology. The elements that have been identified as common to these definitions are :

- The digital library is not a single entity;
- The digital library requires technology to link the resources of many;
- The linkages between the many digital libraries and information services are transparent to the end users.
- Universal access to digital libraries and information services is a goal;
- Digital library collections are not limited to document surrogates; they extend to digital artifacts that cannot be represented or distributed in printed formats.

10.2.4 Advantages

The traditional libraries are limited by storage space while digital libraries have the potential to store much more information, simply because digital information require very little physical space to contain them. As such, the cost of maintaining a digital library is much lower than that of a traditional library. A

traditional library must spend large sums of money paying for staff, book maintenance, rent, and additional books, Digital libraries do away with most of such expenditures.

The various advantages of Digital Libraries are as follows :

1. **No physical boundary.** The users of a digital library need not to go to the library physically. People from all over the world can gain access to the same information, as long as an internet connection is available.
2. **Round the clock availability.** A major advantage of digital libraries is that people from all over the world can gain access to the information at any time, as long as an internet connection is available.
3. **Multiple accesses.** The same resources can be used at the same time by a number of users.
4. **Structured approach.** Digital library provides access to much richer content in a more structured manner, i.e. we can easily move from the catalogue to the particular book then to a particular chapter and so on.
5. **Information retrieval.** The user is able to use any search term in the form of the word or phrase to browse entire collection for a particular item. Digital library can provide very user friendly interfaces, giving click able access to its resources.
6. **Preservation and conservation.** An exact copy of the original can be made any number of times without any degradation in quality.
7. **Space.** Whereas traditional libraries are limited by storage space, digital libraries have the potential to store much more information, simply because digital information requires very little physical space to store digital resources.
8. **Networking.** A particular digital library can provide the link to any other resources of other digital library very easily and thus a seamlessly integrated resource sharing can be achieved.

10.2.5 Factors Influencing the Digital Libraries

The environment in which library and information services operate is undergoing continuous change. Until 1980's libraries literally had a monopoly of provision of information. The users have to depend completely on libraries for information publication they need. However the escalating quantity and cost of publications made it impossible to stock all the publications that their users want. Although the quality of collection and provision of services are still crucially important factors, the past decades have seen great deal of change in the scholarly information provision. In addition to the greater flow of printed publications, a great increase in electronic sources has taken place. Information and communication technology and digitalization of information resulted in considerable changes in library acquisition

and delivery of service.

Virtual library may be characterized library of the future by four key aspects. In the first place it will be a gateway to information, in whatever format this information comes in and wherever it is located. Secondly, because of the increasing complexity of information networks the library will be an expertise centre. Nevertheless, there will still be a pressing need for the library to be a physical entity, not only in the sense of being a social meeting place and place of scholarly interaction, but also as a place where students and other users are provided with modern study facilities and adequate user support. Furthermore, during the coming decades, the library will retain its importance as a collection centre of printed material.

To sum up, the factors that influenced towards development of digital library can be attributed to :

- Speed of information accessibility,
- Emergence of electronic resources,
- Escalating price of information sources,
- Demand from users for scholarly information,
- Information and communication technology, and
- Networking technology

10.2.6 Digital Library Services

Digital media capabilities bring significant opportunities for the library to improve access and the value, it provides from its collections. The digital library consists of critical mass of digitally held documents- words, still images, sound and any combination of these. These documents may be stored in more than one places in different institutions. Provision of the documents will be subject to agreement with and, as required payment to copyright and the intellectual property owners.

The digital library is the gateway to the exciting new resources and networks that comprise the global information environment. It links from vast print collections to thousands of online texts, and from rare books to world wide networks.

Digital Library Services includes information about all the services, collections, digital resources, library instruction sessions and services. It identifies, evaluates, develops, and implements products and services that enable our members to develop and administer effective and useful digital resources. It also provides the tools, training, and consulting services which librarians need for cost-effective data creation, data management, project administration, and standards implementation.

Through the digital library, Library can enhance the services provided to users, and also to reach new users. Digital collections and services will supplement rather than replace the traditional collection and services. The specific services of digital library include providing remote access library resources-both printed and non-printed, service deliveries and generation of information in library. Depending upon

the by laws of regulations of the individual organizations, the access could be limited to members, or limited to certain resources like commercial databases, where only members can access them through password.

10.2.10 Digital Library Development

Successful digital library development requires an exploration of and very likely a significant change in perspective regarding the Library's priorities, including allocation of staff, appropriation of resources, the changing balance between print and digital collections, and the quality and content of staff learning opportunities. The creation of a Digital Library requires action in two major areas :

- The acquisition of Web-based digital content, and
- The provision of staff and organizational resources to support its use.

The range and availability of digital content are expanding rapidly. In order for the digital library to become a reality, more electronic content is required, including full text resources from a variety of publishers covering a range of disciplines. The effective use of information technology in support of the development of the digital library requires commitment and action in the key areas of infrastructure (hardware and software acquisition and maintenance) support and instructional delivery support.

Budgetary Support : Annual increases to the acquisitions budget are essential to allow for the planned growth of digital resources to meet student and faculty needs. A balance between digital and print materials is very important.

Infrastructure support : The development of a long-term-plan is essential to provide ongoing infrastructure upgrade and maintenance in order to increase the capacity of services. Internet connectivity preferably on lease line or dedicated line is desirable for the terminals within the Library or through networking in LAN environment.

Remote Access : Student and faculty access to networked information resources from residence, office and at home is a critical element in the transformation of teaching and learning through technology and should continue to be a priority for the library.

Hardware Upgrades : As the number of digital resources available through the Library continues to grow, it will be increasingly necessary to develop and implement a hardware replacement plan for library servers, workstations, scanners, CD-Writers and other peripherals.

Software Support : Along with hardware support the proper software support is essential to provide security, reliability and to enhance the performance of the digital library services. The digitalization needs strong database designer and a web browser. SQL at the backend and Visual Basic .Net at the front-end could be the one of the option for creation of digital library in networked environment. Visual

fox pro could be another option.

Staff Support : Human factors are the key for success. Staff learning and increased knowledge throughout the library regarding concepts and issues involved in digital libraries, electronic publishing and electronic information technology, as well as their impact on the Library should be taken care of by the staff. Staff should be technically competent and service oriented towards the users.

10.2.8 Products and Services of Digital Library

In the IT age, the development of computer technology has reached to its apex more specifically in the networking field where, the world has turned to a global village. Internet and the WWW technologies are providing a challenging technological environment and intellectual impetus for the development of digital libraries. The Internet could be able to establish a global connectivity of computers and the production of different indigenous products, tools, and techniques for networked information provisions and retrieval. The productions, which are in electronic from and stored in digitalized bit form, include.

a. Electronics Mail (E-mail);
b. File Transfer (Ftp);
c. Telnet (Remote Login);
d. Gopher;
e. WAIS and WWW for information/electronic publishing and access using the text coding standards such as Hypertext Mark up Language (HTML) and Standard Generalized Mark up Language (SGML) where. SGML is a Meta language to describe markup language implemented through HTML;
f. Electronic Journal (E-Journal);
g. Electronic News (E-News);
h. Table of contents;
i. Preprints;
j. Technical Reports;
k. Software and data archives including Library catalogues, discussion forms, preferences sources, course ware, directories etc.;

The E- Publishing which is a successful venture of electronic age can be defined as the publication process where the manuscripts are transferred to electronic format and distributed to the users by employing computers and telecommunications. In the most sophisticated interpretation, the full capabilities of electronic media including motion, sound and interactive features are exploited in the creation of a completely new publication in Machine -readable from which are distributed on magnetic tape and video discs and can be accessed like any other database. CD-ROM, videodiscs and On-line bibliographic databases form a major part of E-publishing field. In the field of Telecommunication Technology, the Integrated

Service, digital switches and digital paths are used to establish a varieties of services such as videotext; E-mail; digital fascimile; teletext; Database access; E-fund transfer; image and graphics exchange; document storage and transfer; video conferencing etc.

10.2.9 Recent Developments

The application of IT in Libraries and Information centres has raised the competency of information acquisition, processing, storing and retrieval and more particularly the electronic document delivery system. There is a tremendous implication of this in all quarters of digital libraries including the impact of electronic publishing in general and electronic journal in particular which proved to be an inherent capabilities for manipulation, searching and acquiring of information resources. The digital libraries could admit a direct interaction among the end users with the various networks and information resources in remote access areas without any geographical limitations. The Boolean search of full text through browsing made it a positive solution to the emerging problem of the scholar in the midst of ocean of information.

Added to this, the tremendous success of CD-ROM as the optical medium of choice for the thousands of publishing firms led to the generation of optical information storage system through CDs at par with E-Publishing for its storage of good quantum of data, durability, crystal presentation, and affordability. The Electronic Journals, periodically available through on-line are being produced published and distributed nationally or internationally via electronic networks. The major impact of the transfer of electronic information in the digital libraries is concerned with the quality, authenticity, and reliability of information services. In addition to this, the mode of transfer of information could be well effective through electronic clipping services, & electronic reference service, in digital libraries. The electronic preservation through selection, acquisition, organization and above all the standardization, creation of Met abases, display technologies are also the important components of impact of the digital libraries. The preservation is important as it captures culture and accesses important concepts of the present digital libraries which are evolving into digital community by uniting people with common interest in a new way.

During 19100's the digital library which were basically confined to minicomputers entered to a drastic revolutionary change in 1990's with the swift development of IT multidisciplinary development of software technologies which paved the way for inclusion of text, image, audio, video, graphics, including hypertext within the boundaries of digital libraries. The Internet made a positive contribution to build the true image of digital libraries in shape of electronic storage of information, retrieval, document delivery, accessing of information through various databases,

interlibrary-loan, acquisition, price control transfer of flies, transfer of information etc. Further, CD-ROM, optical videodisk and other latest technological developments also made significant contributions for understanding the digital library.

10.3 Virtual Library

10.3.1 Scope

Virtual Libraries consists only of resources available in digital format, which can be accessed locally, stored on a hard disk or accessed through computer networks, unlike digital libraries; virtual libraries do not consist of full text articles and multimedia. They are more of an index of relevant, hand picked links to external resources on World Wide Web. The selection and categorization of information sources of virtual library are generally handed by one expert or a group of experts.

The virtual library was first conceived and run by Tim Berners Lee and later expanded, organized and managed for several years by Arthur secret. The Late Bartrand Ibrahim was a key contributor to the pre-association phase of the Virtual Library development. The Virtual Library was incorporated as an association sans but Lucratif (Not for profit association) in the republic and canton of Geneva, Switzerland. The name Virtual Library Web site was redesigned in 2005 and many old or deal individual librarians were removed from the index of virtual library.

10.3.2 Definitions

Virtual Library may be defined as a library which has no physical existence, being constructed solely in electronic form. According to (Sarasevic, 2000) "Virtual Libraries are organized collections of digital information. They are constructed collections organized for a particular community of users, and they are designed to support the information needs of that community." Virtual libraries can offer resources from many sources, and in many formats, including audio and video. The items in these virtual collections do not have to reside on one server, but they share a common interface to assist the user in accessing the collection. The emphasis in virtual libraries is on organization and access. "The Design determines the type of learning that the virtual library supports", say Baldwin and Mitchell. Libraries can exist in two different spaces, a physical space and a virtual space. Each space enables different activities, and serves different purposes. Many libraries exist only in one space, while others maintain a hybrid space, both a physical and virtual space, in recognition of the distinct information uses and learning activities that can occur within each environment. All libraries, whether virtual or physical, create an environment for learning.

Holdings in virtual library are found in electronic stacks. In short we may say that it is a library that exists, without any regard to a physical space or location. It is a technological way to bring together the resources of various libraries and information services, both internal and external, all in one place, so users can find

what they need quickly and easily.

10.3.3 Advantages

There are many advantages to going virtual. Some of the advantages include the following :

a. It saves and/or reduces the physical space taken up by library materials.
b. It often adds enhanced searching capabilities in a digital format.
c. The library materials are available at the user's desktop, regardless of where the user is physically located.
d. It allows for the inclusion of materials only available on the Internet or in digital format.
e. It provides the user with the capability to download and manipulate text.
f. It often allows for multiple, concurrent users.
g. It eliminates the problem of a book being missing or off the shelf.
h. It is less labour intensive.

10.3.4 Disadvantages

a. Every product has its own distinct user interface.
b. Users need to remember different passwords for different products.
c. The scope of coverage and available archives is often limited.
d. There are often difficulties with downloading or printing. Often there is no cost savings, especially when both the virtual and print products are maintained.
e. Everything is NOT available in digital format.
f. There are restrictions, which vary from vendor to vendor, on how the product can be used.
g. The virtual library relies on power and computer networks in order to be available for use.
h. Users can't spread everything out in front of them and use it all at once.
i. Users are most comfortable using books.

10.3.5 Development

The stages of development that are involved in creating a virtual library, or converting portions of a traditional print library into a virtual library, can be broken down into seven areas;

- The Decision Making Process
- New Training and Skills for Library Staff
- Installation and Testing
- Creating a Structure for Organizing and Accessing Materials
- Marketing and Promoting Materials
- Training Users
- Evaluation and Reevaluation

The last three are actually a continuous chain. With new users constantly coming and going, and changes and upgrades being made to the products, marketing, training and evaluating is an ongoing process.

10.3.6. Drawback and Limitations

1. Connectivity

Virtual libraries require connectivity. If there is no Internet connection, the virtual library is inaccessible. Although internet use is becoming more widespread, there are still many people who do not have internet access. The term digital divide has been applied to describe the gap between those people with access to the internet and information technology tools and those without.

2. Skilled Professionals

The term second-level digital divide appropriately describes the group of people who has access to the internet, but lacks the skills to utilize the information that is available effectively.

Virtual Libraries still require skilled professionals to organize, maintain, and help users reap the benefits of this virtual environment. The power of internet resources remains latent to those without the skills to use them. Although some virtual libraries are lists on web sites and require little internet searching ability, other virtual libraries demand the knowledge of Boolean searching and advanced searching skills to realize the potential of the databases. Users often experience trouble making effective choice when confronted with multiple databases, and feel difficulty with effective searching and are often unable to determine whether items they locate are relevant for their needs. Virtual spaces require scaffolding and coaching. Who will classify the knowledge and information ? The takes don't go away in the virtual environment. The teacher-librarian is needed more than ever in this virtual library guiding users in their selection, evaluation, and use of the many electronic option.

3. Storage of digital Information

There are other issues of a more technical nature that impact on the learning potential of resources available in virtual libraries. Storage of digital information is relatively new and the many of the long-term storage issues have not been settled, the permanency, or lack thereof, of digital information : achieving digital information to make it accessible in the future; and the long-term maintenance costs of information in digital format.

4. Acquisition of Resources

Virtual libraries have increased the number of resources available to library users, but, often, many of these resources would not be materials that the library would ordinary add to their collections. This is particularly true with online periodical databases available on a subscription basis. When libraries purchase online

database, collection are no longer tailored for a particular community of learners.

10.3.10 Summary

Virtual Library has no physical boundary. The resources of virtual library are stored only on hard disk and can be accessed anywhere. Internet connectivity and skilled professionals are pre-requisite for a good functional virtual library.

10.4 Hybrid Library

10.4.1 Concept

The term 'Hybrid Library' has been coined in recent times to describe the way in which the libraries of the future will function; and it is already being widely used in the majority of developed countries. Hybrid libraries may be developed at all these levels. In terms of its 'concept', the hybrid library is generally defined as a library in which electronic and print based sources of information are made available together in an integrated way for consultation by users, local and remote; the hybrid library is a middle point between the traditional library and the fully digital library. Opinion is divided on the issue of whether the hybrid library is likely to be the main model for the foreseeable future or whether the hybrid library is a transitional stage leading to the fully digital library. There is, in reality, a very strong continuity between traditional library roles and missions and the objectives of digital library systems.

This thinking is based on the belief that the needs of serious information seekers can only be met by providing the user with access to both electronic and traditional information resources. Any modern quality library service must Endeavour to provide ready access to both types of resources. Furthermore, it should provide such access in an integrated fashion. Its search pathways should present to the user a combination of relevant electronic and traditional resources in response to searches based on author, title, subject, etc. Its browse pathways should similarly lead the user to both categories of resource.

The UK eLib Electronic Libraries program has coined the term "Hybrid Library" to cover services that unite the functions of the traditional library with those of electronic, digital or virtual library services :

A Hybrid Library is envisaged as the bringing together of technologies from electronic, digital or virtual library projects which have been taking place round the world as well as in the UK's eLib programmer, plus the electronic products and services already in libraries, and the historical functions of our local, physical libraries.

A Hybrid information environment can be described as one where an appropriate range of heterogeneous information services is presented to the user in a consistent and integrated way via a single interface. It may include local and/or remote distributed services, both print and electronic. The environment will provide some or all of the following functions : discovery, location, request, delivery and

use, regardless of the domain in which objects are held. Domains may include eg. Libraries, archives, museums, government. There may be dynamic configuration to reflect an individual user's interest (or a group's interest). The environment will depend on open systems and standard protocols. While the emergence of digital library services has increased the challenge of integration in some areas, it has created potential solutions in other areas, such as in integrating the discovery of local and remote resources, or of collection level and items level resources.

10.4.2 Definition

A Hybrid Library is a library where 'new' electronic information resources and 'traditional' hardcopy resources co-exist and are brought together in an integrated information service, accessed via electronic gateways available both on - site, like a traditional library, and remotely via the internet or local computer networks. The hybrid library is different from a typical library website in two ways. One is the permanent and equal inclusion of print information sources alongside the electronic. A second is the attempt to focus and interpret the whole service - subject - specific and generic elements- for a particular group of users in a scalable fashion. The philosophical assumption underlying the hybrid library is that libraries are about organized access, rather than local collections - which become just a part of the means of delivery. The term 'hybrid library' gained prominence through the UK Electronic Libraries Programmer (eLib.)

Some consider the hybrid library to be a transitional stage between the traditional and the digital library. Others consider it to be the likely model for the foreseeable future. The latter model seems to be more plausible, given the enormous historical investment in print and the scale of the cultural changes needed to move to purely digital delivery.

10.4.3 Scope

The Hybrid Library is on the continuum between the conventional and digital library, where electronic and paper-based information sources are used alongside each other. The challenge associated with the management of the Hybrid Library is to encourage end-user resource discovery and information use, in a variety of formats and from a number of local and remote sources, in a seamlessly integrated way. The hybrid library should be seen as a worthwhile model in its own right, which can be usefully developed and improved.

Hybird Library owns and subscribes to a range of resources and services which are supplied in a variety of formats and media; print monographs and serials, electronic journals, abstract and indexing services on CD-ROM, music CD-ROM, etc. However, there is currently no uniform way of managing and providing integrated access to these hybrid resources. Users are forced to interact with each service

individually and waste time in repeating the same step to search different systems. At the same time, using different interfaces also increase the risk of inefficiencies—such as failure to discover relevant resources.

Although Library and information Services have long endeavored to adopt a user centered approach, the issue has now become even more acute because of the greater heterogeneity of user groups. It is recognized that information needs. IT skills and works- patterns of one set of users may differ radically from those of another set of users working on a remote site. Early investigations reveal some commonality of experience between the groups, chiefly.

- Users want more copies of key print sources.
- Users get frustrated when resources shown as available on the OPAC can not be located.
- IT and information handling skills are often inadequate.
- Users often have difficulty in searching the OPAC.
- There is demand for more support and guidance from Library and Information Services staff.

Hence there is a need for the close involvement of users, reinforced by clear evidence that their expressed needs are often at variance with those perceived by Library and Information Services staff.

10.4.4 Management and Organization

Successful hybrid library implementation involves closer integration among stakeholders such as library staff, computing staff, academic staff, and educational development staff. We have to assess to what extent organizational structures are changing in order to enable and support co-operative complementary working in the provision of learning support.

Other management aspects include training and development of service staff in order to achieve an appropriate skills mix, support and instruction for users, team-working and the management of change. Ultimately, these issues must be addressed strategically at the institutional level as the hybrid library promises to become a central element of teaching, learning and research activity. Development which may be cultural, organizational, strategic or personal, as well as technical and financial.

10.4.5 Human Resources Development In The Transition Towards The Hybrid Library

Developing and implementing services based on electronic information and being a partner in developing new teaching and learning environments requires that a whole new set of qualifications have to be available in the library. Besides operating the "old" paper based library, new services have to be invented and available technological solutions have to be implemented and applied in the daily operations.

One of the key factors in inventing and operating new services is the acquisition of new staff competence. The rapid changing environment, new technological tools and increasing customer expectations calls for new attributes and new approaches to library and information service.

Man power development should be given an important thrust. All the library professional should be given two months long intensive basic training course in computer operation. The training on operating Software must be given by competent people.

In short we may say that human resource development should concentrate on :

- Network Knowledge and general hardware Knowledge
- PC and peripheral equipment- "first aid" in case of technical problems
- Use your browser - browser functions, wall paper, bookmarks, save to disk etc.
- The WWW - OPAC for non-Library educated staff
- Internet Pointer Guide

10.4.6 To design the Jobs

Another important aspect to be considered is to design the jobs in the "electronic" Library. The basic assumption is that the work processes in the traditional "paper based" library are well know and well described and that it would be double task to describe the work processes in the "electronic" Library.

It is hard fact that the transition towards the hybird does not take place in a vacuum- the transition cannot be seen as an experiment in a laboratory where one can control all environmental conditions. The transition is mainly because of the attitude towards the change. The transition can be a very turbulent environment or a smooth peaceful changeover.

More radical steps towards the "electronic" library, plus the fact that the available technologies develop at a rapid pace, has made it rather clear that the "new" library world will do best by saying farewell to the well known, very specific and thus static job descriptions and instead provide each staff member with the necessary means to continuously create and up-date their own jobs.

Implementing a combination of different "tools" can do this. The most important of these are :

1. Including a certain pressure or competition as to the necessity of being up-to-date, curious and self responsible, in order to be valuable for the organization.
2. Organizing the institution in such a way, that the individual staff have the competence to make decisions on their own, take individual and group initiatives without having to pass several levels of decision makers, thereby

allowing staff to make mistake and learn.

3. Facilitate self organized or group organized education or development of competence "on demand" that is with very short notice, for instance by establishing the technological conditions for distance learning and communication.

In short, instead of creating the job description, the important thing is to provide the frame work for the individual staff member to create and change the job on a continuous basis.

10.5 Self Check Exercises

Exercise 1 Fill in the blanks

a. Digital Library in its broad sense is a collection of information of .....
b. The digital library requires ..... to link the ..... of many libraries.
c. Virtual Library has no ..... being constructed solely in .....
d. A Hybrid Library is one where new ..... and ..... hard copy resources co-exist.

Exercise 2 Write down factors influencing digital Library.

Exercise 3 Write down Advantages of Virtual Library.

10.6 Answers to self check exercise

Exercise 1

a) Library resources in digital format.
b) Technology, resources
c) Physical existence, electronic form
d) Electronic Information resources, Traditional.

Exercise 2

- Speed of information accessibility,
- Emergence of electronic resources,
- Escalating price of information sources,
- Demand from users for scholarly information,
- Information and communication technology, and
- Networking technology

Exercise 3

- It saves and/or reduces the physical space taken up by library materials.
- It often adds enhanced searching capabilities in a digital format.
- The library materials are available at the user's desktop, regardless of where the user is physically located.
- It allows for the inclusion of materials only available on the Internet or in digital format.
- It provides the user with the capability to download and manipulate text.

- It often allows for multiple, concurrent users.
- It eliminates the problem of a book being missing or off the shelf.
- It is less labour intensive.

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LESSON NO. 2.5

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LIBRARY SOFTWARE : ESSTENTIAL FEATURES

Structure of the Lesson

Objectives :

This lesson will make the learner familiar with the essential features of library softwares and the criteria for selecting good software for library.

Library Softwares: Essential features

11.1 Introduction :

The term software stands for a set of computer programmes designed and developed to accomplish tasks. Library software is the pre-requisite for the operation and successful functioning of the library. In simple terms, library software is that which helps integrate three aspects of running a library :

1. Business Practice
2. Customer Service
3. Intelligent Use of Information.

Many software packages are now available for use in Library and Information Centres. Librarians are primarily concerned with software packages for text-retrieval or information retrieval. In addition to special purpose information-retrieval packages, there are also a number of general-purpose packages that offer some information retrieval function. The name oof some library software packages are as follows :

1. LIBSYS 2. DELMS 3. ILMS 4. SOUL 5. LIBRARIAN 6. LIBRA 7. LIBMAN 8. ULYSIS 4. LIBRIS 10. MEMLIB

11.2 Criteria for selecting library software:

i. Ease of Use
ii. Data Entry made simple and data only has to be entered once to appear in all modules
iii. Export/Import of data
iv. Tried & Tested Features
v. Menu based operations; the software should incorporate Windows functionality such as switching between modules and applications without exiting the system.
vi. Incorporated Mandatory Fields of CCF
vii. Good Documentation (Online Help/Documentation), the software should contain a help facility available when required by the inexperienced user. Manuals in print or electronic form are easy to use and explain the process within each module.
viii. Large User Community
ix. Compatibility
x. Vendor
xi. Performance
xii. Flexibility
xiii. Value
xiv. Powerful Search Facility/Query Builder
xv. Customer Support & Maintenance
xvi. Continuous Support for Upgrades
xvii. Printing Various Reports into several formats, the software should allow users to design and produce a wide range of simple and complex reports.
xviii. Reviews
xix. System security, the system should allow the allocation of different levels of access to different functions.

11.3 Library Activities

Activities of libraries include a large number of areas that should be included in library software. These include:

a) Acquisition
b) Cataloguing
c) Circulation
d) Information retrieval
e) Serials control
f) Online search assistance
g) Current awareness service etc.

11:3.1 Acquisition

The aim of the acquisition module is to provide an efficient mechanism for the comprehensive collections control. Librarians can create budgets, allocate funds, and track them. The system has the ability to record the purchase cost of an item, automatically update the cost of the collection and produce reports which indicate current values and replacement costs. Acquisition functions include:

- Receive the Request
    - Initiate to procure
- Duplicate Checking
- Approval Procedures
- Orders, Invoice Processing for new books & Payment
    - Reminders, Cancellation of Order, Reordering, etc.
- Receipts of Books
- Intimation to the Users
- Enquiries
- Reports
- Exchange Rate, Vendor Record, Discount, Accession No's etc.
- Budget Management
- Request for Title
- On-line enquiry
- Database reorganization
- Transfer of Acquired titles to the Cataloguing
- Security

11.3.2 Cataloguing

The aim of the cataloguing module is to provide an accurate database of all resources. Catalogue is an important operation as it is the principle means to assess the library materials and assist library users to select documents of their choice. Software should have the following features for cataloguing :

- Creation of index file of terms extracted from the title, author, subject and other fields.
- System support for creation and maintenance of an online and interactive bibliographic database of individual records for each item in the library collection.
- Shelf list production
- Maintenance
    - Titles-in-Process, Update Holdings, Call Nos., Subject Updates, Keywords, etc.
    - Transfer of Data to OPAC & Circulation
- Classification Codes
    - UDC, DDC, CC etc.

- User Services & Products
  - CAS
  - SDI
  - Bibliographies
- Printing
  - Catalogue cards, labels etc. arranged alphabetically by authors under subject headings.
  - Reports of titles received within a given period of time.
  - Date, update and conservation in standard format, eg. ISBD, MARC, ISO 2704, etc.

11.3.3 Circulation

The aim of the circulation module is to provide an efficient and effective method of managing resources including charging and discharging, reserving items and stocktaking. Software should have the capability to perform all or some of the following operations:

- Issues
- Returns
- Renewal of Books, Journals, etc
- Reserves - Recall, Reservation, Reservation Cancellation
- Membership Records
  - Maintaining records of library users and identifying them through ID No.
  - Registration, Category, Institute member. Define subjects for SDI
- Collection Updates
  - Display Titles, Copy missing, Damaged, Withdrawn, Binding etc.
- Inter Library Loan
- Enquiries
  - Checking out records of library documents.
  - Checking in of returned materials.
  - Status, Transactions Log, Charges, Missing, Withdrawn etc.
- User Communication
  - Reserves, Overdue, etc. Preparation of overdue or recall notices.
  - Notification of the delinquent borrowers.
  - Posting of files and production of file notices.
  - Making reservations and producing reservation notices.
  - Reminders

- Reports\Printing
  - Production of circulation and statistical reports.
  - Production of mailing list labels.
  - Fine Amount Collected
  - Fine Receipt
  - For a particular period
  - System Setup
  - No. of Days issues, Category wise issues, Reference, Serials issue etc.

For carrying out these functions software are designed to capture and manipulate information of documents, users and transactions.

11.3.4 Information Storage & Retrieval

The aim of the information search module is to provide access to sources of information relevant to user needs. Software should include the following features for information retrieval :

- A built in export and import facility of data in machine readable files in standard format such as MARC, ISO 2700 and CCF.
- Capability to connect with external online databases and ability to download data.
- Ability to create and store profile of individual user and provide SDI output.
- Searching
  - Sequentially
  - Capability to handle large database
  - Index
    - Computer-generated Index
    - Provision to index users specified fields/sub fields.
- Indexing of Stored Information
  - Max. No. of Characters indexed per term
  - Max. no. of different indexes per file
  - Different Ways of Indexing
    - Single word, Compound terms & whole (sub) fields
  - Choice of each file to be indexed
  - Indexing of New Records/batch indexing
  - Speed of indexing
  - Size of indexed data
  - Flexibility to allow users to write their own specification for local use.
  - Building / Removing of Indexes or Changing the *type* of Index
- Retrieval of Stored Information
  - Searching through an Index or Sequential

- O Non-indexed through Sequential search
- O Availability of Index list on the screen as search terms
- O Default search fields
- O Boolean searching with AND, OR and NOT operators
- O More operators with parenthesis
- O Search terms and/or previous search terms can be combined directly in Boolean searches
- O Range searching
    - From, to, greater than, less than
- O Saving the search strategy.
- O User friendliness without seriously affecting its efficiency.
- O Ability to conduct many searches simultaneously.

• Output of Data

- O Standard formats
    - Display, Printing & Writing of data
- O User defined output formats
- O Sorting of data in varies fields (multiple)
- O Including field tags or names
- O Formats for direct data exchange
- O Reference lists according to Journal styles

11.3.5 Serials Control

The aim of the serial module is to provide access and manage information published in magazines and journals. Library Software should allow librarians to track serial subscription, some of the key features of serials are:

- Subscription of New Journals
    - O New Titles, Approval procedures, Order, Subscription Details, Invoicing, Payment, Correspondence, etc.
- Renewal of Journals
- Receipts of New Issues - Issues Received (Kardex)
- Unlimited no of copies of a given issue
- Browsing Issues - Capability to search for an issue by keywords
- Predict Next due date, the system stores the publication frequency of each serial and uses this information for reporting the non-receipt of issues
- Reader List
- Claims Monitoring
    - O Periodical Reminders for missing issues
- Binding Serials
- Enquiries
- Circulation of Back issues
- Reports Generation

11.3.6 Online Search Assistance

Online searching is a complex task requiring considerable knowledge of subject, databases available, search formulation techniques and command language for databases to search. Online search assistance is available to help searcher in two ways i.e. by providing training to the end user and by automating the online search process. Software packages available to automate online search process can have one or more of the following features :

a) Storage and transmission of search strategy.
b) Storage of search results for off-line editing.
c) Translation of the command languages.
d) Databases section.

11.3.7 Current Awareness Service

Software is concerned with the approaches of production of Current awareness bulletin, running of selective dissemination of information (SDI) services and brings out evaluative reports. A current awareness bulletin is commonly a categorized list of bibliographical references of currently entered items in a database of a library. The bulletin may include brief abstracts along with citation details of included items. An SDI output consists of references obtained by matching users and document profiles.According to the Strauss, CAS is "establishment of a system of renewing publications immediately upon receipt, selecting information perfinent to the programmed of organisation served and recording individual items to brought to the attention of there persons whose work they are related to. It involves a combination of processes including the retection of pertinent information from books, periodicals, pamphlets, reports from anything of serious contents that is received." This definition covers all aspects of CAS.

11.4 Self Check Exercise

Q.1 Elaborate essential features of Library Softwares.

Q.2 What are the fuctions of Library which should be included in the good Library Software ?

BACHELOR OF LIBRARY & INFORMATION SCIENCE

PAPER–BLIS-108 INFORMATION TECHNOLOGY BASICS

LESSON NO. 2.6

AUTHOR : DR. KULWINDER SINGH & AMANDEEP SINGH MARWAHA

STUDY OF FEATURES OF SELECT LIBRARY SOFTWARE PACKAGES : LIBSYS, SOUL AND KOHA

Structure of Lesson

Objectives : In this lesson students are introduced to the following software packages which are used in libraries.

- LIBSYS
- SOUL
- Koha

Library Software Packages

12.1 LIBSYS SYSTEM

12.1.1 Introduction

"LIBSYS for library automation" software is the start of a new experience for librarians and public users. LIBSYS is an integrated library management software package designed and developed by LIBSYS Corporation New Delhi. LIBSYS is designed and tailored to serve Librarians and users of today. LIBSYS is the most comprehensive, fully integrated multi-user system designed to run on super/micro/mini computers, Library Software package available in India, today. It was initially developed in COBOL language but now converted into C language and supports almost all the activities of library related to acquisition, circulation, cataloguing, serial control, articles indexing, abstracting, OPAC etc. It has its own centralised bibliographic database based on ANSI 234.50 format. Having been in operation in a number of organizations and in many libraries in the country, LIBSYS has been accepted as the market leader and the only software solution of its kind available in the country. LIBSYS follows international standards such as CCF, MARC etc. LIBSYS is easy to operate and the library staff can begin to use it quickly without any pre-requisite programming/ Computer skill. It has following special characteristics; Interactive and screen oriented, menu driven, powerful editing facilities, user defined security, help and multilingual use etc. It ensures high productivity because of minimal data entry requirements, maximum possible integration of functions and powerful search and query facilities.

LIBSYS users include National Informatics Centre (NIC), TIFR, C-DAC, INSDOC, Indian oil corporation's Library Division, Government of India's Department of Electronics, Library and Information service Divisions of Ministry of External Affairs, AIIMS, IGNOU, Planning Commission, University of Hyderabad, Space Application Centre and Parliament etc. It has more than 110 registered users in south Asian Countries since 1488.

LIBSYS can be implemented on many platforms such as WINDOWS (NT/ 2000 / XP), UNIX (various types) and LINUX. Besides its own database handling capabilities, any other preferred industry standard such as SQL Server, ORACLE, and MySQL etc. can be used as a back-end. LIBSYS has following salient features:

1. Based on Client-Server model
2. Multi-lingual support for Indian and International languages/scripts

3. User-friendly Windows GUI
4. Web OPAC
5. Import/ Export of Data in Marc and non MARC
6. Supports Barcode/ Smart card for capturing of member ID and item ID
7. Interface with Digital Video Camera (to capture member's photograph
8. In-built Barcode Printing
4. Optional Back-End RDBMS (ORACLE or SQL Server or MYSQL) with ODBC connectivity.
10. Internet enabled
11. E-mail interface
11. Sophisticated Security feature

12.1.2 Modules of LIBSYS:

12.1.2.1 Acquisition / Ordering :

This feature allows an enhanced management procedure for activities that include ordering, receiving, invoicing, stocking, and dispatching capabilities. The Acquisition System of LIBSYS deals with selection and ordering of books and other library materials such as reprints of articles, audio-visual tapes, maps, etc., including duplicate check; approval process; placing order; receiving material against firm order; invoice processing; payment requisition; order follow-up, online queries by titles, orders, invoices, vendors, and budget heads; and generating various reports. It also provides a precise budget analysis and expenditure maintenance at any point of time. On selection of acquisition module, following four windows appears:

1. Ordering
    i. Enter title- To initiate procurement of a title
    ii. Request to Vendor- For titles which have not been received request letters can be generated.
    iii. Approval form- can be initiated periodically and printed
    iv. Approval status- prior to placing the order the status can be seen.
    v. Return- rejected title through approval form should be entered here.
    vi. Update Title- Title once entered can be changed or even removed.
    vii. Place Order- to develop the order for the approved titles and can be amended, deleted and printed here.
2. Invoicing

i. Receiving- material received should be registered here.
ii. Invoicing-allows more than one invoice for an order with facility of multiple currencies with exchange rates.
iii. Payment requisition- can be generated after invoice amount tallies with the total.
iv. Payment details- cheque details can be entered here.

3. Miscellaneous
   i. Records keeping - vendor records, budget heads, currency codes, exchange rates and accession details for old titles can be entered here.
   ii. Enquiries- on titles in acquisition, on orders and invoices, on vendors, and miscellaneous queries on budget head and accession register.
   iii. Reports- such as purchase order can be printed here.
   iv. System setup- allows entering library parameters like currency, vendor, budget head discount etc. and system options to select ID'S for purchase order, payment requisition etc.
   v. House Keeping
4. Gifts/Grants
   i. Enter title- to enter the material received as gifts or on exchange basis.

The data flow in acquisition system is as follows:

Initiating Titles - Titles may either be requested by members or received 'on approval' from vendors etc.

- Checks for duplication of title.
- To order additional copies or new edition of existing titles existing data can be used i.e. no need to re-enter data.
- Option to download or copy bibliographic Data from CD-ROMs, international databases or vendor-supplied electronic Catalogues.

Approval Process - Involves printing of approval lists as and when required and then updating the status of each title as 'Approved' or 'Rejected'.

- The process to include specific titles in an approval form is flexible.
- Amendments can be made in approval list prior to its printing.
- Analysis of Budget and expenditure can be done.
- Titles can be categorized subject wise in the approval list.

Placing Order - Both firm orders for titles requisitioned by staff and also material received earlier 'on approval'.

- Prints purchase orders for direct mailing or for electronic transmission to the vendor.

- Flexibility to include specific approved titles in an order, or of single publisher or vendor.
- Orders can be modified or changed and can be cancelled as well.
- Special delivery instructions can be specified.
- Standing orders for annual publications can be handled.
- Provides for pre-paid orders.

Receiving - Procedure to record the details of items received. It can maintain for subsequent accessioning, an in-process file of items received 'on approval' and items ordered.

Invoice Processing - Includes accessioning of items

- It permits more than one invoice for an order.
- It maintains exchange rates of various currencies.
- It allows changes in unit price, discount, exchange rate, etc.
- Accession number can either be generated automatically by the system or it can be a user-defined number i.e. generated by user. Keeps up-to-date status of orders w.r.t. titles ordered, received, accessioned.
- It allows online updating of funds accounts.
- Separate procedure for accessioning items received gratis, in exchange.
- It has an option to accession before invoicing; or accession and invoice together or invoice before accessioning.
- It has an option to generate bar code labels of required size for sticking on material.

Payments Requisition - Provides an effective procedure for getting sanctions from the Accounts section or generating requisition to account section for making payment directly to vendor. The system allows putting more than one invoice in the payment requisition notices.

Order Follow-Up - It can be done for specific titles on order, or for an entire order

- Overdue notices/reminders can be sent periodically.
- Online printing of follow-up notices.

Online Queries - include:

- Titles in the process of acquisition.
- Pending orders, titles ordered, titles received, pending titles, its invoice and overdue orders.
- List of invoices, for a specific invoice, details of items accessioned against it and payment details, if any.
- List by vendors, giving titles received 'on approval', orders placed
- Budget analysis of titles in the acquisition process.

- Order details by Accession number.
- New arrivals.

Reports - Various reports generated by the acquisition module are

- Approval request form.
- Purchase order.
- Overdue/Follow-up notice.
- Budget and expenditure analysis.
- Payment requisition report.
- Payment cheques delivery notices.
- Bill register.
- List of recent arrivals, etc.

12.1.2.2 Cataloguing :

LIBSYS cataloguing module is genuine in its features, in addition to its simple screens and comprehensive nature. LIBSYS is built around its own centralised bibliographic database based on MARC format supporting different types of materials, print and non-print. It makes the various catalogues/indexes available on-line for instant reference and thus enables searching on subjects and key words. Cataloguing sub-system of LIBSYS facilitates maintaining in-process title; catalogue production either by data import or entering data; catalogue maintenance; thesaurus construction; authority files maintenance; holdings updates; holdings summary by ranges of Call No., printing 3x5 inch catalogue cards, preparing special bibliographies, list of recent arrivals and SDI facility, and import/export of bibliographic data in standard exchange (CCF, MARC, etc.) formats. It makes available various catalogues/ index's online for instant references. On selection of cataloguing module, following two windows appear :

Window 1

a) Maintenance- to maintain the bibliographic database of different types of documents.

b) Online searches-various catalogues like title, author, classified, subject, place, publisher can be accessed online and searched using Boolean operators .

c) Current awareness- new additions can be generated classified by subject or alphabetically as desired.

d) Bibliographies- to develop bibliographies on specific subjects and then print them or maintain them. Updating can be done on any title listed.

e) SDI- allows denning various interest strategies w.r.t members defining their respective interest profiles.

Window 2

a) 3x5 cards- including main entry, title card, subject card etc. can be printed using the develop file function or new additions and then can be removed once printed.
b) Print Catalogue- such as author, title, classified, subject can be printed.
c) Reports- various formats can be generated like book slip, keyword list, subject list etc.
d) Data Import/ Export- comprehensive import and export of bibliographic data in standard MARC or non-MARC formats.
e) System set up- enables selection classification scheme.
f) House keeping- for specific selection of functions.

The capabilities of LIBSYS cataloguing system are :

Maintaining In-process File - This lists titles entered through the Acquisition system but yet to be catalogued which gets updated automatically on cataloguing each title.

Catalogue Production and Maintenance - Bibliographic data may be imported or can be entered in different formats for various types of materials.

- Titles accessioned in Acquisition can be catalogued and Bibliographic data can be updated without having to re-enter data.
- Data may be entered directly for titles not coming through Acquisition.
- No limit on field size.
- Data import/export possible in both standard format (MARC) as well as non-standard format.
- Option for different MARC formats.
- Allows changes in bibliographic data including data removal facility.

Electronic Resources - can handle digital contents along with various multimedia files that are integrated with its search engine.

Bar Code Printing - an in-built utility to facilitate printing of Bar code labels for identification of books and other materials.

Authority Files - are structured to be suitable for all fields. LIBSYS authority files include the following fields : By source, publisher, author, series, keywords to safeguard uniformity of data and finally subject. Its unique structure easy to use data entry enriches the process of cataloguing.

Holdings Updates - Provision to specify copies for reference or for circulation.

- Addition of new copies.
- Transferring from reference to circulation and vice-versa.
- Withdrawals of copies.

Catalogue Cards - Prints complete set of 3x5 cards as per AACR-2 standards.

Book Slips - Containing Class no. and Accession no. of books and other materials.
Current Awareness Services - List may either be in alphabetical order by author, title or classified under subject targeted to cater even to specialized interests of users

- List of recent arrivals.
- Special bibliographies.
- SDI facility.

12.1.2.3 Circulation :

As part of LIBSYS software, circulation allows full management over members database with regards to front desk operations such as issues, returns, renewals, reserves/ holds; membership records keeping; collection updates including monitoring of items on display and in bindery; overdue follow-up and recall facility; inter-library loans; stock verification; flexibility in operations including option for use of bar codes scanner for borrower and material identification; comprehensive statistics on circulation; reporting capabilities which includes list of highly reserved titles, statistics on number of issues by title/ borrower, list of delinquency cases, non-circulating material list, etc., and keeping log of all the circulation transactions providing suitable checks at every stage. It maintains up-to-date membership records and the latest status of the collection meant for circulation. This feature can also utilize the data to be analyzed statistically for reporting purposes. On selection of circulation module, following two windows appears:

Window 1

a) Member records- various functions like registration, renewal, cancellation, issuing duplicate membership card.
b) Collection updates- record of documents on display, in bindery, withdrawn or missing etc.
c) Check-out- adopting lending policies and entering manually or through bar codes member ID and Accession no.
d) Check-in- a document may be reported as damaged or lost and also compute fines.
e) Renewal- allows policies for renewal.
f) Reservations- not available on shelf can be put on reserve by more than one member
g) Recall/follow up-to generate recall notice.
h) Inter library Loan

Window 2

a) Inquiries- can be specific like on members, collection, various statistics, transaction log and serial circulation.
b) Reports- for members, specific notices like overdue reminder etc.,

checking-in and checking-out of documents.

c) System set-up - can set parameters related to members options, accession no options, SDI, etc.

d) House keeping- log files, fine file, cancelled records, reservations etc.

e) Serial circulation-user interface of circulation of accessioned volumes/ loose series.

f) Fine collection- is based on Member ID.

Various functions in circulation are:

Front Desk Operations - Include issues, renewals, returns, reserves.

- Operations handled efficiently with least possible data entry
- Suitable blocks both on member and item
- Use of bar code technology is allowed.
- Option to display photograph of the member (in-built image option)

Membership Records Keeping - Registration record and membership updates.

- Option to photograph from digital camera and generate an ID card of required size with photograph and bar code number.
- Lost or stolen cards can be invalidated immediately.
- Issuance of duplicate membership cards.
- Institutional borrower records for inter-library loans.

Collection Updates - While cataloguing collection records meant for circulation are created automatically.

- Monitoring of items on display and in bindery.
- Keeps track of lost, missing, damaged, written-off, withdrawn items.

Overdue Follow-up and Recalls - Generates overdue reminders and makes possible recalling checked out material before the due date.

- Number of reminders and period between reminders based on membership category.
- Online printing of recall notice for a specific title.

Inter-library Loans - Keeps record of both inward and outward loans to other libraries and institutions.

Stock Verification - For the purpose of stock verification generates list of the collection in the library and items currently checked out. This list is verified with the material present on shelf, thus, getting the list of material not accounted for.

Management Reporting -

- List of highly reserved titles and comparison with present no. of copies in collection for planning future acquisition
- Title/Borrower-wise statistics in relation to the number of check-outs
- Non-circulating material list for weeding out the collection

periodically

- Overall circulating statistics broken down further yearly/monthly/ hourly, by subjects and borrower category

Reports - The system provides for the following reports.

- Overdue, collect, and recall notices.
- List of 'no responses'.
- List of highly reserved titles.
- List of non-circulating material.
- Checkouts to a borrower.
- Stock verification list.
- Delinquency records.
- Statistics on no. of issues by specific title/borrower.
- Statistics by subject/borrower category.

Transactions Log - Maintains a record of all the circulation related transactions that may either be viewed on screen or printed.

12.1.2.4 Serials Control :

The serials module enables your library to track, ordered, and receipt journals under coded serial titles. It includes check in process that indicates the next issue expected and the total number of copies due for that particular issue. It is an independent subsystem providing for new subscription; subscription renewal; subscription extension; invoice processing; budget and expenditure analysis, recording of issues received (Kardex update); claims monitoring which include generating notices for 'not received' overdue and damaged/soiled issues, missing issues, various indexes/lists, online queries on various aspects of serials control including serial holdings; and circulation of loose issues and bound volumes. It maintains the record of budget sanctioned for serials under different categories, thus providing complete budgetary control. This system also handles periodicals received on gratis or in exchange. Various reports generated by serial system include list of current serials, approval form, subscription order, bindery order, overdue notice, bill invoice register, etc. The records keeping functions include history status of serials, budget heads, vendor records, subscription modes, etc. Various functions related are

a) New subscription - New serials initiated, goes through the approval process and ordering.

- Duplication Check.
- Prints approval lists.
- Prints Purchase Orders for direct mailing.
- Provides for monitoring the status of each serial until the first issue is received.
- Accepts subscription details as and when they become available.

b) Subscription Renewal- Initiates approval process for subscription renewals, followed by ordering. The process of renewing subscription of current serials involves the following functions.

- General renewal request/ approval form printed either by Department/ Centre or Library, based on subscription expiry date.
- Enter approved serials.
- Ordering.
- Update subscription details.
- Status of renewed serials updated as 'Approved' or 'Rejected'.
- Receiving.

c) Invoice processing- Both for new subscription and subscription renewal.

- Allows more than one invoice for an order.
- Allows changes in subscription, period, and volumes, etc.
- Accepts supplementary invoices for any title.

d) Receiving issues (issue) - repetitive function performed in the simplest manner.

- Recording of issues by volume/issue number or date, whichever applicable for the serial.
- Facility to record receipt of regular issues, special issues and additional issues.
- Makes note of damaged and faulty issues for subsequent replacement.

e) Claims monitoring - timely follow-up of 'not received', overdue and/or damaged journals numbers.

- Schedule updates
- Reminder notices printed automatically based on periodicity of each serial
- Received status inquires takes into account feedback received from vendor or publisher about delayed, out-of-print, and out-of-stock and already mailed issues. Irregular issues monitored by entering expected schedule of publication.
- Display reminders
- Online printing of reminder/follow-up notice for a specific issue/ number of any serial.

f) Bindery management - Alerts when a serial is to be sent for binding and provides for its continued monitoring through the bindery and back.

- Generates volumes completion report to initiate binding process
- Flexibility in generating the bindery order
- Keeps track of volumes sent to bindery and their receipt on/when return

g) Circulation - User-defined routing of issues registered, along with circulation of bound volumes and loose issues.

- Borrowers records keeping

- Checking-out
- Checking-in
- Routing of an issue immediately on arrival may be defined, before it is displayed or circulated

h) Online Queries - Serials related queries are:

- By title - new serials, renewed serials, and subscribed serials, giving the current status of each title.
- By vendor - giving the current status of orders placed with the vendor and list of invoices received.
- By department budget heads - list of serials and expenditure analysis by department or section and budget details.
- Titles in bindery
- Recent arrivals

i) Reports - Reports generated by Serial System are:

- Approval request form
- Subscription order form
- Alphabetic list of serials
- List of current serials
- Serials by special issues
- List of missing/ overdue issues
- Subscription renewal order
- Notices for 'not received', 'overdue', 'damaged' issues
- List of duplicate issues
- List of completed volumes
- Bindery order
- Accession register (for bound volume collection)
- Current arrival
- Classified and specialised indexes and lists of serials, as required
- Budget & Expenditure analysis

12.1.2.5 Article Indexing and Abstracting :

Article Indexing system provide the facility to maintain a separate database containing the articles in journals received in the library. Articles Alert facilitates the indexing and abstracting of articles from various journals which include entry of article data, update of Boolean searches; periodic documentation list, personalised SDI, and bibliographies on specific subjects. Various functions of article indexing module are:

Maintenance Functions - To build the articles database.

- Adding a new article.
- Modifying details of an article.
- Removing an article.

- Listing article details and option to print the same.

Database Searches - Article may be searched by browsing any of the following indexes: -

- Author
- Title
- Subject/Keyword
- Searching by Title keywords.
- Combination searches using Boolean Operators (like 'OR', 'AND' and 'NOT" based on words from any field).

Current Awareness Services - Generating lists of the latest additions.

- Options to generate CAS by Author/Title alphabetically or by classified subjects or by subject/keywords.

Bibliographies - A list of articles on a specific subject can be generated with the 'Bibliography' function. The selected entries are automatically stored in a user defined 'Biblio' file. Following functions facilitate generating bibliographies :

- Searching
- Update 'Biblio' file
- Print search lists
- 'Biblio' file maintenance

Selective Dissemination of Information (SDI) - To generate user specific list of articles based on subject profile. It matches subject interest profiles with either or full or part of the articles database.

12.1.2.6 OPAC: Online Public Access of Catalogue (OPAC) provides various catalogues/indexes such as author catalogue, title catalogue, subject catalogue, classified catalogue, Boolean searches using logical connectors 'OR', 'AND', and 'NOT; electronic mail facility for outline reserves, personalized SDI, notices and messages. It is the hub of all information resources that provides a single point of access to the world of information. To find a record via OPAC is an effortless experience, the Patrons in the library can search the bibliographic database and find specific information online, either by choosing out of the browse list or simply entering a term or phrase in search feature. The search facility also tells the user about the availability of each item for circulation, including current status of individual copies of a title and reserve status. It also shows titles on order displaying current status in acquisition. Other services from OPAC Client - Updating subject interest profile for SDI by users themselves; request for acquisition of a document; while browsing / searching various catalogues, facility to develop request online for putting a specific title on reserve, etc. Various services are:

Online Catalogues - makes available following catalogues on-line:

- Title Catalogue
- Author Catalogue

- Subject Catalogue
- Classified Catalogue
- KWIC Index
- Publisher
- Conference Place

Searches - The use of the logical connectors 'OR', 'AND' and 'NOT' is allowed (using Boolean Search). There is option to conduct searches on specific bibliographic fields or on all the fields. It can be limited by specific publishing period or/and document type. The search results may either be viewed on screen or printed.

Recent Additions - Makes available new additions to the library.

Current Serials - To provide online information on holdings of current journals including recent issues received.

Images / Full text Retrievals - Full text images or images from a specific portion of a document can be browsed in multi-windows interface.

12.1.2.7 Web OPAC :

The search results are displayed in a list of titles with author, title, year of publication and call number. For a selected title, complete details along with the number and status of copies are given. There are following facilities available:

- Simple Search
- Advance Search
- Additional Search
- Browse
- Journals
- New Arrivals
- Patrons

Simple search - Enter word(s) from any of the searchable fields such as author, title, subject, etc. The search could be restricted to a specific field with option to form a phrase or use 'OR' and 'AND' operators between words.

Advance search - This interface allows for development of complex search strategies using Boolean operators 'OR', 'AND' and 'NOT' between keywords in various fields.

Additional search - Another interface to develop search strategies using word(s) from various searchable fields with an implied 'AND' operator.

Browse - Alphabetic lists of author, title, subject, publisher and conference place may be browsed. By entering the initial characters of the required word, the list or catalogue scrolls till it positions the string at the beginning of the display screen.

Journals - The serials list may be browsed, and on selecting a journal, holdings in both bound volumes and loose issues are displayed.

New Arrivals - A list of recent additions to the library collection, both books and journals, may be seen.

Patrons - Patrons are provided facilities to list the items they have checked out, the titles they have reserved, request for acquisition of new titles and change their password.

12.2 SOUL (Software for University Libraries)

12.2.1 Introduction

The SOUL is Windows based, state-of-the-art library automation software designed and developed by the INFLIBNET Centre, an IUC of university grants commission Ahmedabad. It is user-friendly software i.e. it is easy to work with and works under client-server environment. It is flexible software used for automating typical functions of all types for academic libraries for library management and complete automation of the library. It has been designed taking into account the international standard, bibliographic formats, networking protocols, and typical functions of all types and sizes of libraries, particularly practiced in the university libraries. The in-built network features of the software will allow multiple libraries of the universities of function together and access to distributed databases installed at various university libraries and union catalogue mounted at INFLIBNET using VSAT network. SOUL-Library Automation Software is a very powerful tool that is suitable for any library including university and college libraries and can also be used in Special or Public libraries.

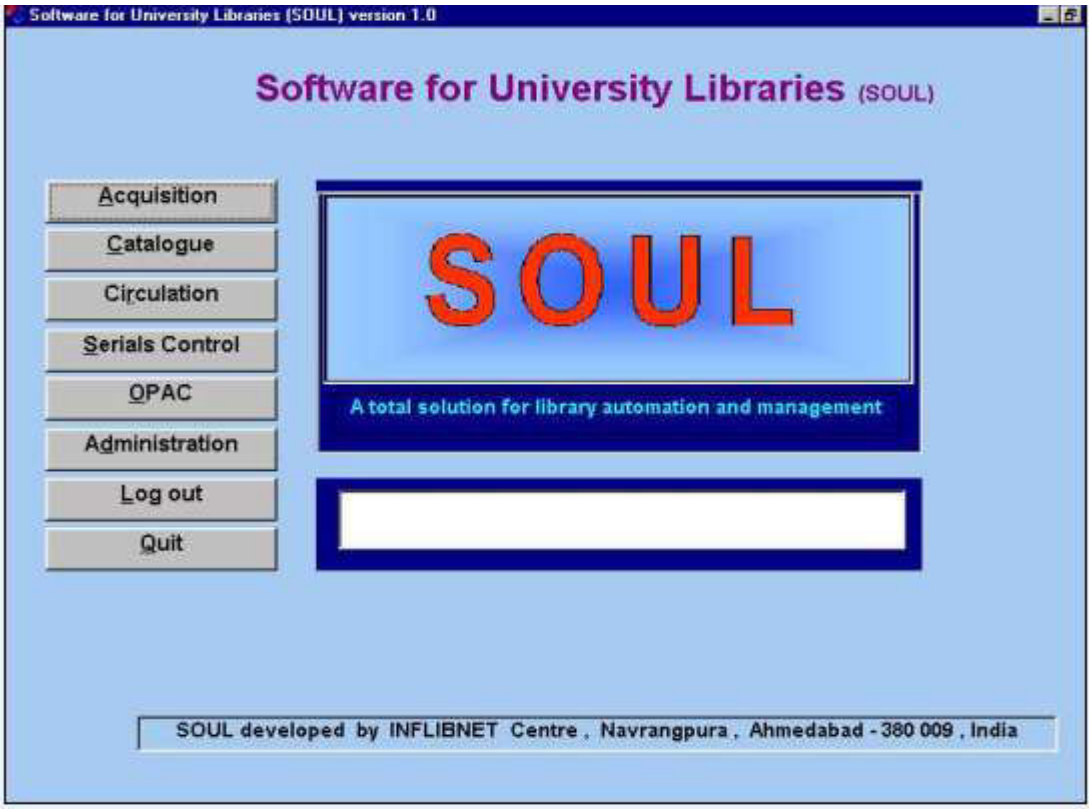
12.2.2 Hardware And Software Required:

The minimum hardware and software configuration required to use the SOUL is given below.

Server :	**Client :**
Pentium @233 MHz with 64 MB RAM 1.2 GB HDD,32 x CDROM Drive 1.44" Floppy Drive Colour Monitor (SVGA) Ethernet card 10/100 Mbps Windows-NT Operating System MS-SQL Server 7.0	Pentium @233 MHz with 32 MB RAM 1.2GB HDD with 10MB Free space 1.44" Floppy Drive Colour Monitor (SVGA) Ethernet card 10/100 Mbps Windows-45 Operating System

12.2.3 Modules of SOUL

- Acquisition
- Catalogue
- Circulation



12.2.3.1 Acquisition

The Acquisition module provides facilities to enable library staff to procure books from different publishers. It handles the following major functions related to acquisition of library material starting from suggestion / recommendation by faculty till accessioning, invoice processing.

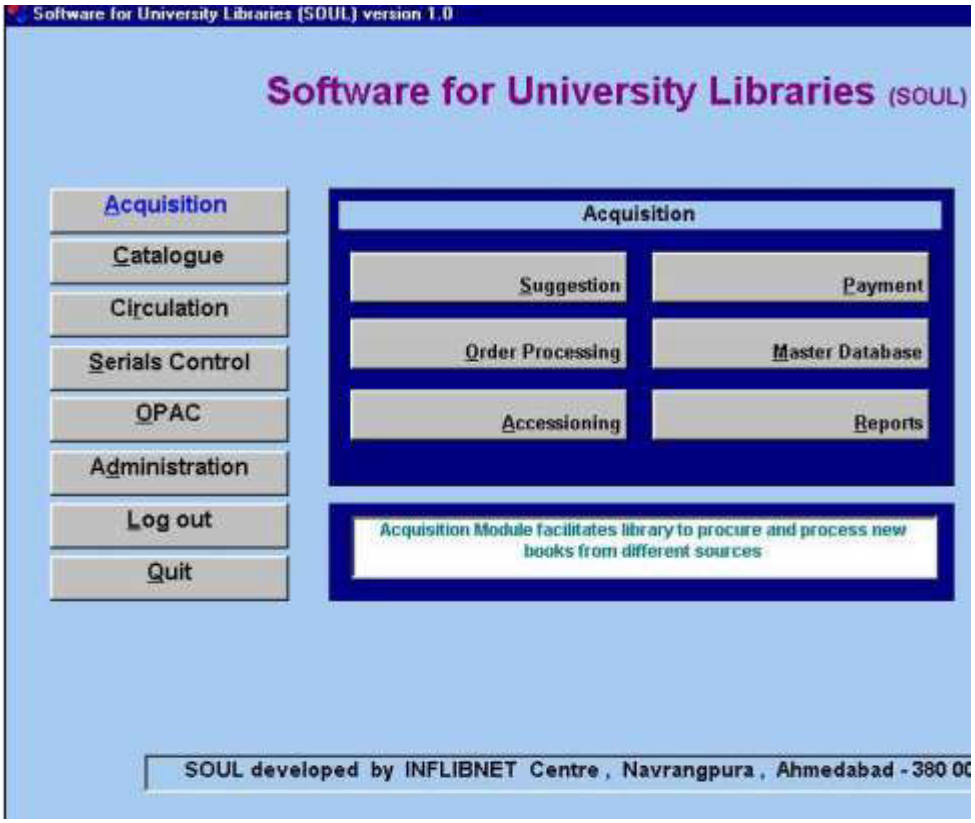
These functions are :

a) Suggestions management

This sub-module enables creation / updating of databases of new items suggested by a faculty member along with bibliographical details. Books received through placement of purchase orders as well as those received as gratis are handled from this module.

The steps involved are :

Update Request
New Request
Data import from other sources
Request for item from vendor/Publisher:
Select for approval.



b) Order Processing

The various titles approved can be ordered to different publishers by assigning order and reference number, setting deadlines for supply and other details can be done under this sub-module. The various processes that can be carried out here are to update order, file printing of order, cancelling the order, reordering, checking order status, and to send reminders.

c) Accessioning and Receive Management

This feature allows the library staff to receive the books from the publishers against various orders. The books can be received by selecting the particular order number and then an accession number has to be given to books. This function supports cross checking with order, receiving partial / full supply of items listed in order, duplicate checking with an existing title by matching the record with same bibliographic information.

d) Payment Management

When the books have been received and accessioned the invoice details are matched with the ordered details. After the details match invoice can be

processed for payment and sent to accounts section for release of payment. This feature also allows modifying the price of books if the price of the books changes when invoice has been generated including conversion rates, handling charges discounts etc. Searching the status of payment and generation of reports are other strong features added in this sub-module.

e) Master Database

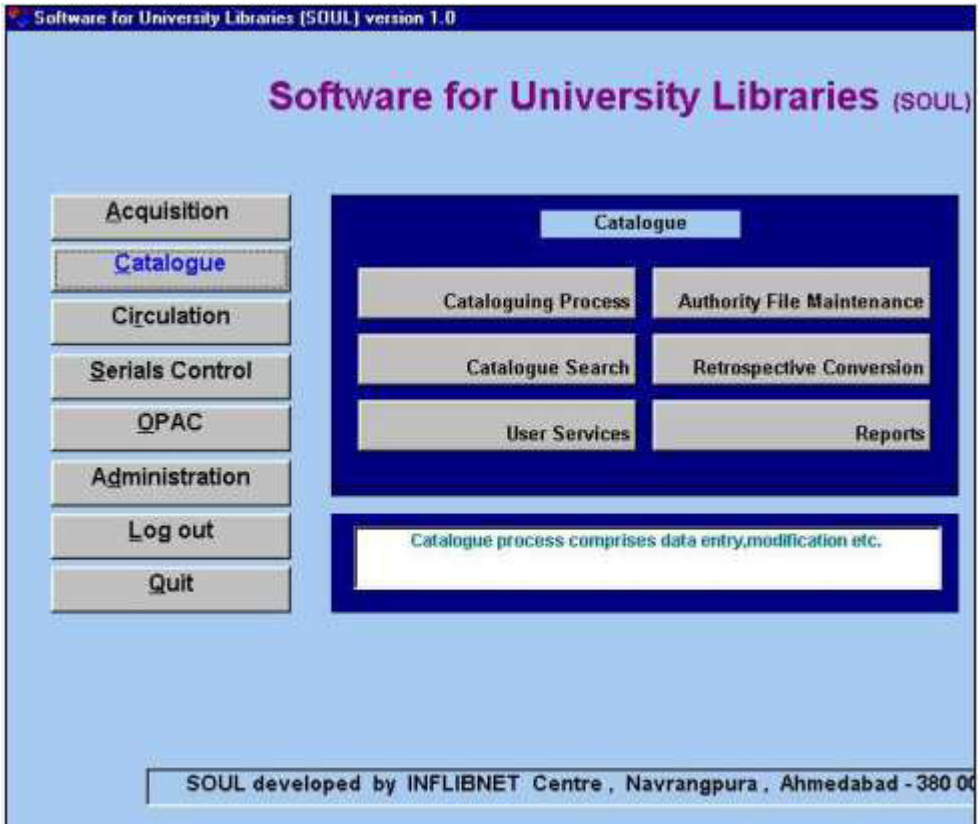
This sub module helps to maintain different databases like: Publisher/ vendor, Currency, Budget codes (both source wise and department wise), etc.Updation and deletion of all this is possible from here.

f) Reports : All types of reports can be prepared by this software regarding the set of items requested by various departments for order processing. There are 13 major reports relating to acquisition that can be created with number of parameters like List of suppliers, items received, invoice register etc. These reports assist in reviewing information about acquisition process.

Through the acquisition module library staff can search the entire database of library holdings for handling almost every function that is being carried out in acquisition division of university libraries.

12.2.3.2 Catalogue

Catalogue module is used for retrospective conversion of books, technical processing of books, printing a range of records for verification, searching by title and accession numbers, authority files for publishers etc. that have already been accessioned in the previous module. A comprehensive database covering almost every field facilitates data entry of all types of books, conference proceedings, thesis etc. in the different regional languages, using respective scripts is also provided. This module allows the library staff to conduct comprehensive searches for existing items before cataloguing new items and has provision of import and export of records and retrospective conversion. This module includes following functions :



a) Catalogue Process function picks up the accessioned item for cataloguing purpose. Remaining information as per specified standards, such as additional bibliographical information, subject headings, classification number etc can be added. To maintain consistency editing of existing records can also be done.

b) Catalogue Search allows searching the existing items, its status, identifying duplication etc. for day-to-day cataloguing purpose.

c) User Services sub module has three major functions viz., generating current awareness list (by date, subject etc), compiling of bibliographies with various combinations and alert services to individual users.

d) Authority File Maintenance serves the function of creation, updating and use of major authority files for names such as publisher, languages, corporate, meetings, authors, physical media, and types of material and also for subject descriptors. This is an important feature added to this software taking into account the consistency that each library needs to maintain while creating records.

e) Retrospective Conversion includes two major functions i.e. data entry of old collection with minimum information without going to first sub-module and import and export of data from and to external sources. This function allows the libraries

to download the matched records from INFLIBNET union catalogue or other sources and export the records for contributing to union catalogue etc. A versatile IS02709 interface developed at INFLIBNET, which is built-in to this module, enables to carry out the job.

f) Reports module includes generation of catalogue cards as per AACR-II, generation of recent editions reports subject and class number wise and other related reports. The catalogue module basically supports all major functions relating to technical processing and has been designed as per the international standards.

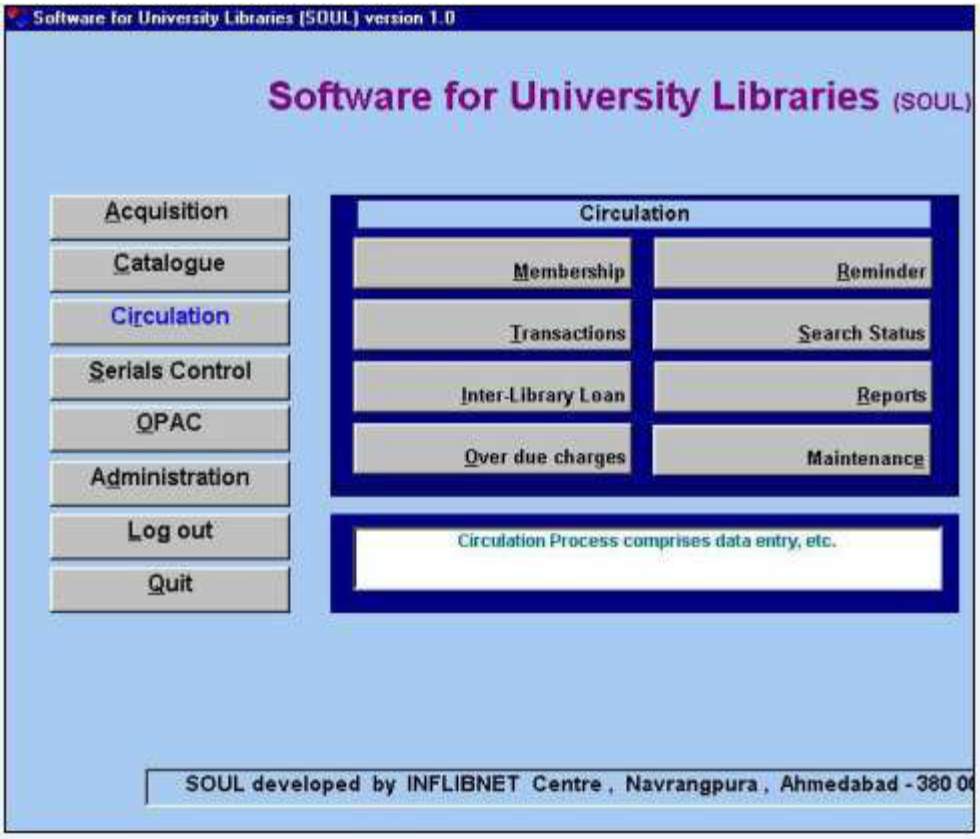
12.2.3.3 Circulation

This module is the heart of Library as it deals with all the transactions between member and library holdings. The circulation transactions viz. issue, return, renewal, reserve, recall, hold can be successfully done. Some complex functions like fine management for each category of user and material wise category can also be effectively managed. Important functions like Inter library loan, searching the status of every member or library item are possible. Reminders for overdue material, generation of various reports have also been covered.

Circulation module can be broadly categorized into the following Sub-Modules :

a) Membership sub-module allows the entry of a new member. The facility to create all types of member records, assigning membership codes, borrowing privileges, renewal, issue of no-due certificates, master databases for codes etc, searching the status of membership or an item, terminating the membership and generating related reports are provided.

b) Transactions provides all major functions such as issue, return, renewal, reservation, recall or reminder of an item, reserve cancellation, recall/reminder to borrowed items,



lost and missing documents, member detail status, etc. This sub module also includes the Book Search feature. Transaction sub module is based on Accession number and Member code. It also supports generating and reading of barcode labels. A unique facility in this module allows one to see simultaneously the details of members, items borrowed, dues etc. while the transaction process is on. The counter staff as well end-user is able to know the exact status of the members borrowing.

c) Inter Library Loan deals with lending of items to specified member library and also borrowing items from other libraries. It takes care of all the details of user libraries, individuals and items loaned.

d) Fine management facilitates collection of overdue charges from the members, providing receipts, keeping up-to-date accounting. Generation of daily, weekly, monthly reports to find out as to how much overdue charges have been collected is possible.

e) Reminder module allows generation of reminders for all overdue materials. Comprehensive listing of materials that are overdue can also be generated within

a specific period giving from and to dates.

f) Search status provides information of items which are either issued to member or issued on ILL or has been withdrawn from collection. It also shows the status of overdue items.

g) Maintenance Management covers binding, lost and cost recovery of books, damaged books, withdrawn books etc.

h) Reports sub-module allows the generation of as many as 16 major reports and with many combinations. All possible reports that a large library expects are provided for.

This module is capable of handling large transactions. If various functions built in this module are effectively used, the library staff will save lot of time and will help to avoid repetitive jobs.

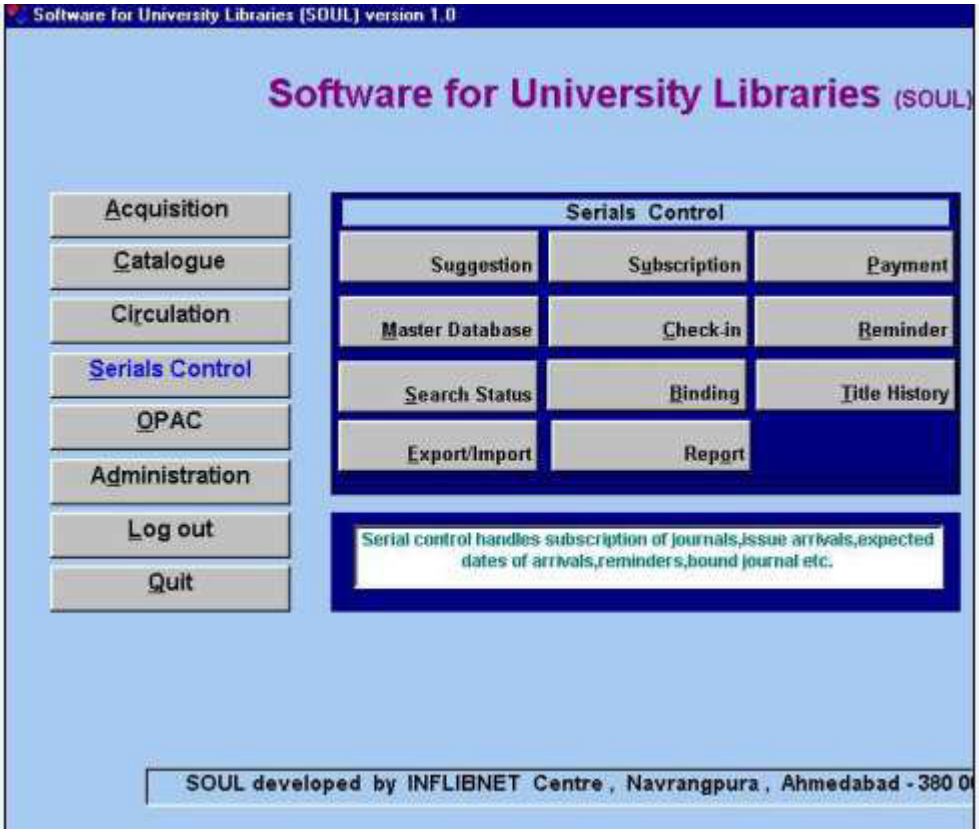
12.2.3.4 Serials Control

This module keeps track of serials easily and effectively. It maintains data about journals, annual reports, newsletters, etc which the library receives periodically. SOUL minimizes data entry required for serial controls. Once a bibliographic detail is entered in the system, all further processing is updated from time to time. This module broadly handles following functions:

a) Suggestion Sub-module keeps track of the suggestions received for subscribing serials. Selection of these titles for approval, preparing budget estimates and generation of related reports are covered under this sub-module.

b) Subscriptions module allows ordering/renewal of serials, follow-up relating to the same and sending reminders, generating orders by supplier or publisher.

c) Payment function processes and records all details relating to each invoice, including supplementary invoice, credit notes processing, reports generation etc.



d) Master Database allows to create a large number of frequently used master databases viz. title entry, language, class number, publisher, binder, country, department, currency, frequency, budget heads, binding type, delivery modes, reports etc. Of these, title entry is main in which the creation of database for each title with bibliographic information begins in the serial module.

e) Check-in module records the receipt of each issue of serial and its accompanying material. To record the issues, there is a facility to generate schedule in advance for each title by providing necessary inputs like volume no., frequency, date of publication of first issue, mode of delivery, total number of issues etc.

f) Sending reminders module allows to send reminders on not receiving of issues or issues that are overdue etc for single or all titles by supplier, publisher etc.

g) Binding sub module supports making sets, generating order, payments, accessioning bound volumes etc.

h) Status search option facilitates one to find the status of every thing starting from subscription to check-in of issues.

i) Title history keeps the record of ceased, suspended, discontinued titles and also changes in title, splits, and mergers along with holdings information for each and every title in the database.

j) Export/Import of data in IS02709 format is also provided which allows the library to transfer the existing records in to SOUL and also contribute data to INFLIBNET union database.

k) Reports sub module has more than 15 built-in reports of all types with different combinations. This adds to the strength of serial module.

Serial module is designed to handle large number of titles, with many options giving maximum flexibility to user libraries.

12.2.3.5 OPAC

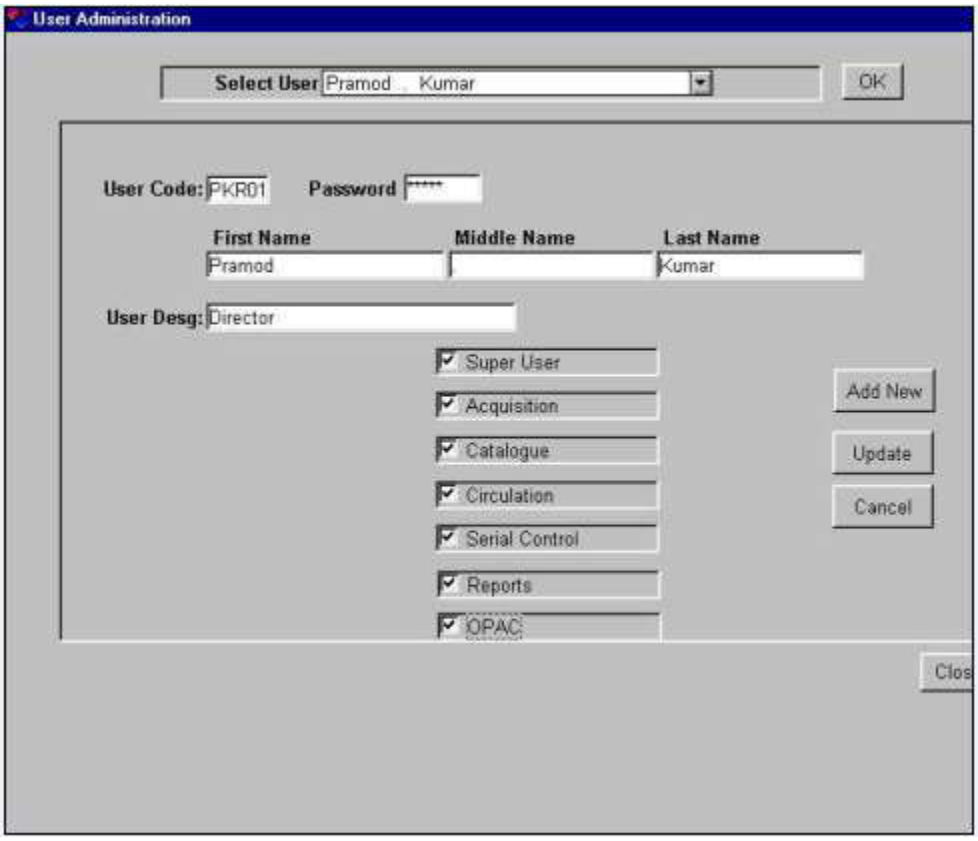
SOUL has a major attraction of having a fully functioned OPAC (Online Public Access Catalogue) that is a window to the library collection. It has user friendly menus through which a user can search for an item available in the library by author, title, corporate author, conference name, subject descriptors, class number etc. OPAC is a dynamic information desk that allows library staff to post library calendar, library rules and regulations, announcements, or any other information of user interest. SOUL allows the users to access the internal as well as external resources of the library. Library can keep entire collection available at users' fingertips. This powerful, yet easy-to-use and user friendly searching tool allows user to quickly find the materials in the library. Some of the major features of OPAC are :

- Use of Boolean operation when more than one search option is to be used.
- Search results can be sorted according to the preference of search item.
- User has option to select variety of display formats.
- Display of records according to AACR-II format.
- Easy and quick searches with options.
- Status of each book starting from acquisition module is reflected.
- Search key fields, such as, author, title, keywords, class number, accession number, etc.
- Accessible through the GUI based web browsers like Netscape Communicator, Internet Explorer etc.,
- User can see the status of currently borrowed items by entering his/her borrower number.
- Search results can be saved and printed.
- Selection of databases can be made according to the choice of users.

12.2.3.6 Administration

Administration module is used for creating new users and to give them

right for accessioning different modules. The system administrator assigns login and password to use each module of the system. The security function, backups, recovery of data and other utility functions are some of the features added under this module. Users have been categorized into three levels looking into nature of functions handled by the staff at different levels.



12.2.4 STRONG FEATURES OF SOUL

Following are few of the strong features of SOUL:

1. It is a Windows based user-friendly software with well-designed screens.
2. It is based on client server architecture allowing scalability to the users.
3. It uses RDBMS concepts to organize and query the data.
4. One can begin using it easily without an extensive training.
5. It is specially designed to work in the large academic libraries i.e. it is capable of handling large number of records.
6. It is multi-user software and there is no limit on simultaneous accesses.
7. Supports internationally known standards such as CCF and AACR II etc.
8. It allows export and import facility of data and adheres to ISO 2709 format.

9. It includes all required features to work in a networked environment i.e. LAN and WAN.
10. SOUL has been fully tested at a number of university libraries and critically evaluated by team of experts and practicing librarians.
11. It provides comprehensive list of reports, master databases and authority files.
12. It provides facility to create, view and print records in regional languages.
13. Available at affordable cost.
14. OPAC is versatile, accessible over the web using any GUI based browsers.

12.2.5 Benefits of using SOUL

- Available at nominal cost to university libraries.
- Software designed and developed exclusively to work under university environment.
- Network feature of the software will allow multiple libraries of university to function together using this software.
- Exhaustive training at INFLIBNET supported by comprehensive manual.
- Also facility of On-site training.
- Free updation /modification and free technical assistance.

12.3 KOHA

Koha is an open source Integrated Library System that originated in 1999 in New Zealand by Katipo Communications with Horowhenua Library Trust. This new system was named Koha after the Maori word that means "gift" or "donation. Koha is a Māori word (not an acronym for anything) " It was released as an open source product and HLT began using Koha on January 1, 2000 (Breeding, 2008). Currently, there are over 80 developers that have made contributions to Koha Since its release as the first open source ILS, Koha has undergone many changes and improvements. The latest version Koha is 3.14.1 was recently released in december 2013 (http://koha.org/). Koha is a full featured Integrated Library System (ILS).There is no cost for the license, you have the freedom to modify the product to adapt it to your needs, etc. It is currently maintained by a dedicated team of software providers and library technology staff from around the globe. Koha is web-based. That by adopting it, the customer becomes "joint owner" of the product. In particular, the customer can freely install new versions or not and can take part in new developments by financing them or by carrying them out them self. Koha is free/open source software means free download under the GNU General Public License. Users of open-source software Koha can often deploy yourself using in-house resources. They pay only for needed support or any additional vendor services they require. It means the cost involved development, upgrading, maintenance etc., Koha does not need the initial cost like commercial software. Here cost means commitment, dedication, and a long term efforts to sustain and development of the software.

12.3.1 Usages of Koha

Although Koha has been around for over 10 years, it has only recently begun to be more widely used. In 2002, the Nelsonville Public Library was the first public library in the United States to use Koha (or any open source ILS) (Breeding, 2008). Nelsonville's use of Koha began to spark some interest in Koha and eventually led to adoption by many other libraries and the formation of LibLime (and other support agencies) devoted to the promotion, development and support of Koha. However, open source ILS is still in the early phase. Proprietary ILS services have dominated for the past 20 years and still represent a huge share of new ILS implementation. Overall, open source ILSs represents a fraction of the ILSs in current use. However, if the current rate of growth is sustained, they could definitely reshape the entire industry, Breeding predicts. According to LibLime, they had contracts to provide support for Koha for 57 libraries in 2007 out of a total of 607 contracts, which is close to 10% of all their contracts Up to this point, Koha has mainly been used in public libraries. Its proportion of use in academic libraries is fairly small, as well as in large library systems. This will likely change as it becomes more proven, but as of now Koha would not be realistic for use in large academic libraries. Currently no members of the Association of Research Libraries are using an open source ILS (Breeding, 2008/2009). Breeding suggests that the current market for Koha is small to medium sized public and academic libraries, special libraries, and museums, with a gradual increase in larger and more complex libraries. Of the open source options, Koha serves the most diverse types of libraries.

12.3.2 Purpose of Koha's Development

There were several reasons why HLT chose to have a new open source system developed rather than go with a proprietary system. For one, the commercial systems they looked at were either too expensive or the ones they could afford did not offer the services they wanted. They believed in listening closely to what their patrons wanted, and the HLT patrons wanted up-to-date technology, but also a strong emphasis on traditional library services. HLT believed there must be a way to provide an automated system that would not cost a fortune yet still meet their needs. By choosing to create an open source option, they hoped to ensure the system's longevity, make it available to anyone who wanted to try it, and encourage cooperative development (Ransom, Cormack, & Blake, 2009).

12.3.3 Why open Source Software KOHA:

- **Proven, Stable Technologies:** Koha is tried and tested and has demonstrated both stability and scalability, used in hundreds of libraries worldwide.
- **Software Collaboration and Resource Sharing:** software solutions those are freely available to all libraries worldwide. Libraries benefits from the contributions of other participating library systems.
- **Long term Support:** With proprietary software, source code is 'closed' and support and future development of the product rely on the success and resources of a single vendor. If the vendor goes under, so does your product support. Open-source solutions rely on stable code bases developed and supported by many providers worldwide.

- **User-driven:** open-source software user-driven—you decide what features are important and deserve attention rather than a vendor.
- **Cost-effective:** paying licensing fees for proprietary solutions, users of open-source software can often deploy the product using in-house resources. They pay only for needed support or any additional vendor services they require.
- **Innovation:** code is open, users are free to innovate and improve the software to meet their needs free innovation also means that open-source software has much faster development cycles when compared to proprietary software.
- Free/open source software koha is an economical alternative to reliance upon commercially supplied software. It means the cost involved development, license, upgrading, maintenance etc., lower than commercial software. koha does not need the initial cost like commercial software.
- Free/Open source Koha has all the feature of commercial software.
- Motivate and encourage staff to creativities.

12.4.4. Features of the KOHA

- It is full featured modern integrated library software (ILS).
- Award winning and free/Open-source Software.(no license fee).
- OS independent any operating system. Linux, Unix, Mac.
- Web based. Web-based Interfaces. We can integrate with website.
- Full MARC21 and UNIMARC support for professional cataloguing.
- Multilingual and multi-user support
- Library-Standards-Compliant industrial standards & protocols.
- Z39.50 server.
- Customizable web based OPAC circulation system.
- Online reservation.
- Full catalogue, circulation, acquisitions, library stock management.
- Web based OPAC, public to search the catalogue.
- Major industry-standard database type (text, RDBMS), SQL,MYSQL.
- Serial management module.
- Print your barcode.
- Export and import records, ISO2709

Advantages of Koha

- Actual software is free (www.koha.org/).
- Supported by a community of highly motivated individuals (Breeding, 2008/2009).
- Gain functionality at a rapid pace.
- Anyone can access the source code and make modifications (www.koha.org/).
- Changes can be made at the local level.

- Next-generation user interface for OPAC (Yang & Hoffman, 2010).
- Can meet the needs of smaller rural libraries that cannot afford proprietary systems.
- Free from dependence on vendor lock-ins (www.koha.org/).
- No restrictions on use (Jones, 2009).
- Supports the mission of libraries.

Disadvantages of Koha

- Relatively new and unproven
- Current focus may be on improving functionality rather than greater innovation (Breeding, 2008/2009).
- There may be unanticipated work load as adaptations are made to fit local needs (Jones, 2009).
- Decentralized development may lead to chaotic progress and delays in fixing bugs (Jones, 2009).
- Customization may not be as great as commercial software (Jones, 2009).
- Currently unfeasible for the larger and more complex libraries (Breeding, 2009).

12.3.5 KOHA standards:

- The developers of the product have taken care to adhere strictly to international standards.
- Industry standards: Z39.50, UNIMARC, ISO2709, MARC21.
- For technical standards: the OPAC is "valid XHTML ", and respects the standards of accessibility.
- Web standards recommended by the World Wide Web Consortium**.**

12.3.6 KOHA Server software

- Server operating system: Linux, OpenBSD, FreeBSD, MacOS X, or any other Unix.
- Web server: Apache.
- Programming language: Perl.
- Database:MySQL.
- Integrated Library software: Koha 2.2.9

12.3.7 KOHA Client software

- Koha requires a recent Internet browser.
- Mozilla is advised, but not obligatory. (Koha works with Internet Explorer.).
- Certain data validity checks are made on the client machine, JavaScript must be enabled.
- The public interface (OPAC) conforms with XHTML1.0 standards: the utility is thus compatible with alternate browsers. In particular, the OPAC can be used by people needing special assistive technology (Braille browsers, voice synthesis, text-based broswers, etc.).

Conclusion

Small or medium-sized libraries and consortia should definitely consider Koha for their ILS. However, this decision would have to be made on an individual library basis. Each of the advantages and disadvantages previously mentioned must be carefully weighed. Marshall Breeding sums it up well when he states, "The open source ILS movement has progressed past the point where its viability can seriously be questioned. The current momentum of open source ILS adoption makes it almost inevitable that it will represent an increasing portion of the library automation landscape. A set of companies has emerged to provide support options. Each of the products has already achieved a level of functionality suitable for its current target market. Current open source ILS products have a demonstrated a history of increasing functionality with models in place that promise reasonable levels of future development (2008/2009, "Conclusions and Observations," para 1). "

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12.4 Self Check Exercise :-

Q.1 Give the salient features of KOHA, LIBSYS and SOUL.

Q.2 Discuss the similarities and dissimilarities between WINISS, LIBSYS and SOUL Library Softwares.

Type Setting :
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