ICT Empower Library and Information Services

J.Siddeswara Shastry

Librarian
Govt First Grade College
Siddapura

INTRODUCTION

Developments in ICT have made significant impact on all spheres of human life. The impact has been rather prominent in case of service activities such as banking, health, transportation, education and libraries. Benefits of use of ICT in services can be broadly explained in terms of 4 Es, namely *economy, ease, extension (or expansion) and efficiency*.

For the Libraries, ICT's has tremendously changed the Management of Resources or House Keeping Operations as well as the way services are delivered. While general IT application tools and Integrated Library Management Systems are largely used in house keeping operations, like acquisition, cataloguing, circulation control, serials control etc; Internet has been used extensively as a resource as well as a tool to deliver the Library and Information Services (LIS). In this studay we will study how ICT has had impact on delivery of LIS.

In the specific context of LIS, one of the implications of use of ICT is that Libraries can reach out globally to provide their services 24-hours a day in very cost effective manner. ICT has enabled users to avail many services without any human intervention, the role of the role of LIS professional is changing from an intermediary to a facilitator and enabler. In this Unit we have grouped the ICT enabled services into two categories as follow:

1. ICT empower conventional LIS, that can be delivered more efficiently through use of ICT, and
2. New Services, which have been made possible due to developments in ICT.

ICT EMPOWER CONVENTIONAL LIS

ONLINE PUBLIC ACCESS CATALOGUE AND USER SERVICES

Library catalogue is perhaps the most important tool for locating material in the Library. Unfortunately until recently its value has been restricted by its physical form, most commonly a large card catalogue or a set of printed volumes. The advent of computers, with their ability to process large amounts of information and output in a variety of formats has finally brought the library to the customer, wherever he or she may be located, in the form of Online Public Access Catalogue (OPAC).

OPAC provides access to the catalogue through a computer terminal. OPAC allows searching the entire catalogue online, conveniently and quickly, using one or more search criteria. One can, for example, search by author, title, keywords, class number or one or more of these combined together. OPAC even shows the current status of a book, whether it is loaned out, available on the shelf or lying elsewhere. Another advantage of OPAC is its ability to display catalogue records in a variety of formats such as *AACR2, MARC* etc, and the records can be displayed in a desired order. For example one can display records arranged (sorted) by author, title or call number. Most library management packages offer printing of bibliographies from OPAC either on a printer or on a file. An OPAC terminal should be equipped with search software, which is usually part of integrated library management systems such as *LibSys, EasyLib, NewGenLib, SOUL, Sanjay* etc. Some integrated library management packages even use OPAC for other user services like reservation, membership enquiry and registration, interlibrary loans etc.

Another convenience that OPAC offers is accessibility from a remote computer, using a local area network (LAN) or a wide area network (WAN). With modern library systems offering interface to OPAC, it

is also possible to provide access from anywhere in the world via Internet. An internet enabled OPAC is called Web OPAC. Web OPAC can be searched using any common browser, such as Microsoft Internet Explorer or Netscape Navigator. Web OPAC. Apart from searching OPAC, some libraries allow their remote users to avail certain online services like book reservations, loan requests for postal loan, loan renewals, membership application, address change, suggesting books etc.

INFORMATION SERVICES

Some of the important changes that developments in ICT have brought about in information services are:

1. Changes in formats, contents and methods of production & delivery of information products, and a new business model for use of information products. This requires procedural and infrastructural changes and cost implications in Libraries.
2. Emergence of Internet as the largest repository of information and knowledge.
3. Extinction or significant transformation of some of the conventional information services such as press clippings, contents pages, company information etc.
4. Use of new tools and technologies for dissemination of information.
5. Transformation of role of LIS professional as the subject specialist and end-user gets directly involved in the information work and consequent need for new skills.
6. Shift from physical to virtual services that offer convenience of time and location for access to services.

Today almost every important reference tools is available in electronic format whether offline (CDROM) or online, providing convenience of use, storage, timeliness and currency of information. Computer storage and compression technologies have made it possible to store large amount of data and information on small digital and optical media, eliminating requirement for large space for holding the printed sources. It is also faster and easier to keep the electronic sources up to date. For example a 24-volume Encyclopedia Britannica can be stored on a single CDROM, and online edition of chemical abstracts is updated every week. Information can also be delivered in a variety of media using different tools, such as CDROM, email, chat, discussion forum etc.

Since its inception, Internet has emerged as the largest repository of knowledge and information containing billions of documents, a major part of which is available free of cost. It means that the library has access to more reference tools that are more up to date and cheaper. Finding particular information in an electronic reference tool is also very convenient and fast. Search engines now provide tremendous power to search and select Internet information effectively and in a user friendly manner.

From the LIS professional's point of view, new environment means adaptation to a different management paradigm. For example the focus has shifted from owning the information to right to use. This has opened a whole new area of interest in issues like licensing, copyrights, pricing and evaluation of services and products. New skills in information retrieval, marketing, web design, user training, technology management etc are required by the LIS professionals. The LIS professional's focus is on making partnership and designing user-friendly interfaces to facilitate users to do their information work.

In the following paragraphs we will now briefly discuss a few types of information services viz. Reference service, Bibliographic Service, and Current Awareness Service in ICT enabled environment. Some new information services are described later.

Reference Service:

Asynchronous tools such as email, subject gateways, FAQs, and electronic libraries and interactive tools like chat rooms, virtual reference desk, and ask-me are replacing the conventional means of post, phone or in-person reference enquiries. *Ask-a-Librarian* allows the user to click on *ask-a-librarian* link to send a formatted enquiry to the reference librarian. The reference librarian either provides an answer, links to resources or link to a subject expert. Interactive tools now allow a reference interview online.

Bibliographic Service:

Compilation of bibliographies, reading lists and state-of-art reports are very parts of LIS work, particularly in research and academic libraries. Browsing through the manual indexes and abstracts is a tedious and time consuming work, and does not always produce up to date result. Availability of databases in electronic form on CDROM or online, offers convenient, efficient and cost effective information retrieval. Electronic databases also provide unique search features such as searching on multiple criteria (key-word, subject, author, source, classification code, year of publication, language etc.), and variety of display formats & styles. Advance features like natural language query ranking the search results in also available in many databases. Web based services facilitate full text searches and link to full text of the documents. *Dialog, STN* and *Silver Platter* are some of the popular database companies that offer bibliographic and reference databases on CDROM and Online platforms.

Current Awareness Service:

Current Awareness Services has been important means for keeping the users up to date in their areas of interest. A current awareness service may be as simple as copy of table of contents or a bulletin containing bibliographic records, of articles selected from the current issues of journals and other material, and usually organized by subjects. Libraries now compile current awareness bulletins using predefined search strategy and running on the database either on CDROM or online periodically and getting the desired output. Subject to copyrights, the output can also be stored on a local system, and disseminated online (internet, intranet) and offline (print, CDROM, email). Table of contents of most journals are available free from the publishers' sites. Some publishers even offer free email update of table of contents. A large number of electronic publishing sites or portals now offer current information via email to registered users. For example one can register on New York Times newspapers to receive summary of news on daily basis.

Internet has enabled a lot of innovations in contents, methods of production and distribution of current awareness products. Tools such as Listserv, Weblog, Webzines and e-newsletters are common. Listserv give the latest information, hot topics, ideas and opinions, a chance to discuss issues, a source of advice and assistance. Weblogs literally log the web. They review, select and package the latest relevant information, in a subject area. Some examples of web based current awareness service are *The NSDL Scout Report for Math, Engineering, and Technology (*http://scout.wisc.edu/Reports/NSDL/MET/Current/) and *Free Pint (*www.freepint.com) are examples of web based current awareness services.

DOCUMENT DELIVERY

It is not possible for libraries to have everything that its clients may need. Libraries use document delivery services from other libraries and commercial organizations for copies of research papers etc not held by them. Locating a source and procuring the document requires considerable time and efforts and the process is laden with uncertainties. ICT has made the document delivery services very simple and reliable. From searching the holdings to ordering and delivery have been benefited by the use of ICT. A large number of libraries now host their up to date holdings on their website and can be searched on internet. Many library networks such as *INFLIBNET* and *DELNE*T maintain union catalogue of their member's journal holdings. One such document delivery service provider *British Library Document Supply Service (BLDSC)* offers a flexible system of receiving orders and tracking. BLDSC's email based document supply system *Artmail* allows registered users to send requests through a formatted email that automatically is processed by *BLDSC*'s system, which generates location of the sources. The documents can be received in print as well as electronic format. Online and web based database services such as *STN* provides link to document delivery services of their own or a third party. Some of the commercial document delivery services are *Ingenta* (http://www.ingenta.com/), and *BioMedNet*, *OCLC* (www.oclc.org/) and Science Direct (http://www.scienceDirect.com). Full text of electronic journal articles that are available in electronic form may also be downloaded through links provided by aggregator or gateway services such as *Informatics's J-gate* (www.j-gate.informindia.co.in/). Electronic journals are discussed later in this unit.

INTER-LIBRARY LOANS AND UNION CATALOGUES

As described earlier, no library can fulfill all the needs of its users from its collection. Resource sharing through Inter-library loan is a necessity for the libraries. Access to the catalogue of partner libraries is crucial to inter-library lending. Union catalogues, standardization and machine readable catalogues are aimed at promoting resource sharing. Printed union catalogues and Computer Output on Microfiche (COM) catalogues and CDROM are now being replaced by web OPAC and web based union catalogues. Librarians can now access catalogues of thousands of libraries across the world using Internet. Developments in digital library and internet technologies have made it possible to automatically update the catalogue records from member library systems, distributed searches using a single user interface, and value added services. *RedLightGreen.* (http://www.redlightgreen.com/) is one of the world's largest web based union catalogues. It. contains about 130 million records from 160 member libraries of *Research Libraries Group (RLG)* in USA. In India, bodies like *INFLIBNET, DELNET* are also developing union catalogues of books, serials and theses.

AUDIOVISUAL SERVICES

Audiovisual materials are important sources of information, education and entertainment. Many libraries particularly media libraries and large academic and public libraries hold audio visual material such as music, films, pictures and photographs etc. Old media of LP records and tape slide have long been replaced with audio and video tape. The new multimedia of audio CD, Video CD (VCD), and Digital Video Disks (DVD) have advantage of higher storage capacity, random access and longer life than audio and video tapes and cassettes. Many libraries allow their members to borrow these. Multimedia documents can now be played on standard PCs, stand-alone or networked. Recent developments in storage media, compression and encryption technology have made it possible to store large amount of multimedia documents on hard disk and disseminate through internet. Software such as Quick Time Player, Microsoft Media Player etc are now freely available to play or see these documents in a browser. You will learn more about various hardware, software and document formats that are used for creation, storage, distribution and use of digital multimedia documents later in the course.

CUSTOMER RELATIONS AND USER EDUCATION

LIS being service organization, customer services and user training are important aspects of its activities. A continuous interaction with users for feedback and information is a must to maintain the standards of service. While the conventional means of interaction such as meetings, suggestion box, surveys and interviews are still important, use of new means of communications such as email, web forms, bulletins boards, discussion forums and listserv are fast replacing these. Not only these tools provide a fast, convenient and transparent and cost effective medium, but also offer scope for innovations and greater peer participation. Some of these tools can even be used by the libraries to involve the users in book selection etc. LIS customer relations can be tremendously improved by innovative use of technology like virtual library tours, making interactive library maps and floor plan available on the library web site. A highly ICT enabled environment requires appropriate training to its users also. The contents of user training must include use of internet tools and resources. Conventional user education programmes can be supplemented with web based instructions and guides for use of resources. In the conventional class room based user education also ICT tools are used for presentation and demonstration.

ICT BASED NEW SERVICES

A library web page or Universal Resource Locator (URL) facilitates single window access to various web enabled library services. A URL could be as simple as a library web page listing the services with some links to catalogue and external free and subscribed resources or may include advance features like interactive helps and value added services such as subject gateways, self-help tools and frequently asked questions, and information about the library such as timings, calendar, rules etc can be hosted on the library web site. Apart from the ICt enabled conventional services, Libraries are making use of potential of internet and computing power to provide new and innovative services. In a web enabled environment the new LIS services can be grouped into the following three categories:

- Providing access to internet and internet based services

- Providing access to web based resources
- Providing access local or internal information resources in digital form

INTERNET ACCESS

Internet is not only a medium for digital communication but also the world's largest repository of information. However, under developed internet infrastructure in a country like India, poses a serious challenge to growth of ICT enabled services. Large segment of user groups may still be deprived of personal access to internet facility. Libraries, therefore, provide free or controlled access to internet and email. Depending upon the availability users can be given time slots for use of internet facility. Usually a few internet enabled terminals are provided in the library that can be used by the visitors for internet access and email etc.

ACCESS TO WEB BASED RESOURCES

As already discussed, many types of library materials such as journals, books, patents, newspapers, standards, photographs, pictures, motion pictures or music are now available in electronic or digital form. From the user's point of view digital resources hold many advantages such as time and place convenience, timeliness, ability to search directly on text (as against the catalogue records), ability to link to further reading material, and ability to disseminate and share information. From the library's point of view digital format offers convenience of storage and maintenance, cost advantage, ability to target global users, etc. However, digital resources also pose human, social and technological problems, such as discomfiture in reading on the screen, problems in internet access and speed, poor infrastructure, lack of sufficient skills to use the digital resources, and perceptional change resulting from right to use rather than physical possession, etc. In this section, we will briefly discuss various some types of library materials such as journal, books, theses & dissertations, patents, course material etc.

E-Journals:

Libraries have been exploring easy to cope with the problems of ever increasing prices of the journals, space requirements and decreasing level of usage as the journals get older. Nevertheless, libraries are required to maintain back issues of the journals, usually in bound form. Electronic Journal helps the librarians in addressing these problems to a great extent without significantly affecting the service levels. Electronic Journals can be accessed via internet from any web enabled PC. Depending on the type of subscription, one or more users can access the service simultaneously, either directly from an independent web enabled PC or in a local area network through a proxy server (IP addresses based access). Electronic journals also offer benefit of full text searching and downloading of articles. Many publishers of electronic journals offer their journals through consortia of libraries at much lower rates. *INDEST (Indian Digital Library of Engineering, Science and Technology),* and *INFLIBNET* are two such consortia operating in India. Access to articles in electronic journals can also be made through aggregator services which offer searchable databases of contents of e-journals from several publishers, and links to journal site for full text. Emerald, OCLC and J-Gate are some of the example of e-journal aggregator services. The main disadvantage of electronic journal is that libraries can not physically possess the journals.

E-Books:

E-Book has been described as a text analogous to a book that is in digital form to be displayed on a computer screen. E-books can be read just like a paper book, using dedicated E-Book reader such as *GemStar eBook* or on a computer screen after downloading it. There are also some newer technologies developing such as electronic paper, which is much like paper, except that the text can be changed, and talking books in MP3 format. E-book offer advantages like portability, 24 hours access, text search, annotation, linking, and multimedia and self-publishing possibilities. Development of e-book is still in the infancy stage and issues like compatibility, e-book readers, availability and intellectual property rights are to be addressed before it can be implemented on large scale.

Electronic Theses and Dissertations (ETD):

Dissertations and theses produced at universities are important sources of information and knowledge for further research. A large number of universities have converted their theses and dissertation collection into digital libraries and have made it available on Internet for global access. A number of universities have also implemented Electronic Theses and Dissertation programmes, where researchers submit theses in electronic format. Some initiatives such as *Networked Digital Library of Dissertation and Theses (NDLTD) (*www.ndltd.org) in development of web based union catalogues of ETDs submitted over 100 libraries throughout the world are worth mentioning.

Patents:

Many patent issuing authorities now have made their complete full text patent records online. For example United States patent documents can be searched and downloaded free of cost from (www.uspto.gov/patft/index.html). Some of the commercial organizations such as *Derwent* also provide downloading of full text patent from either an online database vendor (e.g. *Dialog, STN*) or directly from their site to the subscribers

Course Material:

A large number of web based course ware and teaching aids are being developed to facilitate flexible open learning by many universities and commercial organizations. Many academic institutions have adopted such course material for their curricula. Libraries can provide access to course material to the learners and teacher and thus contribute to open learning. This can be done by providing links to the courseware sites through subject gateways or provide local access after downloading the material. Some of the important sites where web based course material and tools can be found are *Ask ERIC* (http://ericir.syr.edu/), *CAREO-Campus Alberta Repository of Educational Objects Alexandria* (http://www.careo.org) , *LESTER-Learning Science & Technology Repository* (http://lester.rice.edu/), *MERLOT-Multimedia Educational Resources for Learning and Online Teaching(* http://www.merlot.org/), and *GEM- The Gateway to Educational Materials* (http://www.thegateway.org/) .

SUBJECT GATEWAYS

Preparing subject guides or path finders has been an intellectual activity for reference librarians. Such guides are normally prepared in consultation with the subject experts or by a subject librarian, who picks up the sources after careful evaluation. Random surfing of the Internet may be a popular pastime, but is an inefficient use of bandwidth and time. One of the most useful ways to discover quality resources in a particular subject area is use of subject-based Internet gateways and directories. A subject gateway thus is a facility that allows easier access to web based resources in a defined subject area. These are basically a dynamic catalogues of pre-dominantly online resources, though some libraries include information on print resources as well. Generally access to subject gateways is provided through library website, designed to help library users discover high-quality information on the internet in a quick and effective way. A simple subject gateway may list web based or print resources on a given subject with links to the website of the resources and some useful information such as keywords, class number, description and how to access. Advanced subject gateways offer searchable catalogue or even full text search facility on listed sources.

DIGITAL LIBRARY AND ARCHIVES

Many Libraries traditionally have been repositories of local information and heritage documents such as manuscripts, rare books, maps, photographs and paintings etc. Archives or record management is also part of LIS function, particularly in business and research organizations. In other cases such as university libraries, documents generated in-house such as dissertation and theses, research reports etc represent the intellectual strength of the institution. Libraries are developing digital repositories of such resources, and providing Internet or intranet access to these. Large public and academic libraries also provide up to date local information via internet. Digital libraries are a natural progression from electronic document sharing. The main benefit of digital library is the ability to provide 24-hour, remote access to high-demand or restricted materials for multiple concurrent users. Setting up a digital library can either be done

using 'off-the-shelf' digital library products, document management products or library management products capable of digital library management; or in-house system development using open archives software. Some of the off-the-shelf products are from *Blue Angel Technologies*, *CONTENTdm*, *Crossnet Systems Ltd*, *Endeavor Information Systems* , *Epixtech, ESP*, *Ex Libris* ,*Fretwell-Downing Informatics*, *IBM*, *Sirsi*, and *SydneyPlus. Greenstone* (http://www.greenstone.org) is a leading open source digital library management software.

CONCLUSION

Benefits of use of ICT in services can be broadly explained in terms of 4 Es, namely *economy, ease, extension (or expansion) and efficiency*. ICT enabled LIS can be grouped into two categories, ICT enabled conventional LIS, and new services.

Conventional LIS such as OPAC, User Services, Reference Service, Bibliographic Service, Current Awareness Service, Document Delivery, Inter-library loan, Audio-Visual Services and Customer Relations can be provided more efficiently and effectively by using ICT, as they offer convenience of time and place, cost effectiveness, faster and most up to date dissemination and end user's involvement in the LIS processes. OPAC and Web OPAC use power of computers to find the library material and also provide many additional benefits such as online reservation of books, remote access, requesting books for loan, loan renewals, books suggestions etc. Impact of ICT on information services is characterized by changes in format, contents and methods of production & delivery of information products, emergence of Internet as largest repository of information and knowledge, changed role of LIS professional from intermediary to facilitator, new tools for dissemination of information, shift from physical to virtual service environment, and extinction of some conventional information services and emergence of new and innovative web based LIS.

Web enabled services are provided through library web page. New services include access to internet and internet based tools and services, access to electronic information sources and digital library of local and institutional documents. Journals, books, dissertation & theses, course material and patents are some of important sources of information that are now available in electronic form. Electronic resources provide 24 hours any where flexibility and convenience of use by multiple users and full text searches and faster delivery. Subject gateways are one of the useful tools to provide web access to internet resources. Digital libraries provide local contents in the electronic form through internet to global clients.

REFERENCE

- Arora, Jagdish. (2001) Web-based digital resources and services: trends and innovation. In Creation and management of digital resources. Papers presented at the Eighth National Convention for Automation of Libraries in Education and Research Institutes (CALIBER-2001) Pune, March 15-16, 2001. Edited by MKR Naidu and others. Ahmedabad: INFLIBNET Centre. Pp. 185-212.

- Lancaster, E W and Sandore, Beth. (2001) Technology and management in library and information services. London, Library Association.

- Chauhan Buddhi Prakash. ICT enabled library &information services, paper presented at winter school on ICT enabled LIS, Deb. 27-31, 2004, TIET, Patiala.