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Emerging Information Communication Technologies in Academic Libraries

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Abstract
Computing technology, communication technology, and mass storage technology are some of the areas of continuous development that reshape the way libraries access, retrieve, store, manipulate, and disseminate information to users. ICT has impacted on every sphere of academic library activity especially in the form of the library collection development strategies, library building and consortia. Information and Communication Technology (ICT) has brought unprecedented changes and transformation to academic library and information services, conventional LIS such as OPAC, user services, reference service, bibliographic services, current awareness services, document delivery, interlibrary loan, audio visual services, and customer relations can be provided more efficiently and effectively using ICT, as they offer convenient time, place, cost effectiveness, faster and most-up-to-date dissemination and end users involvement in the library and information services process. The impact of ICT characterized on information services by changes in format, content and method of production, and delivery of information products. The paper attempts to discuss the fast development of Information communication Technology and its role and applications in the library services. Today libraries are equipped to accomplish the newly Information Technology based services. Information Technology enabled services fulfil the information needs of the users at the right time in the right place to the right person.

Keywords: Information Technology, Electronic Libraries, E-resources, ICT

1. Introduction
ICT (Information Communication Technology) has changed the way information centers manage. Today ICT plays a very drastic role in the library disciplines. All manual performed library operations are. Converted into computerized operations which means applied ICT techniques in libraries, and providing better and faster services in the end users. As an outcome, librarians have been forced to incorporate new ICT skills. Indian LIS schools should strengthen formal and informal ICT knowledge and training in order to meet the insistence of the current LIS job market. In this digital scenario, ICT has changed the possibilities of the library job promotions and has changed expected library performances. The computer and networking atmosphere has compelled LIS professionals to have appropriate basic ICT knowledge and training skills. These skills can help the librarians to merge advanced ICT skills and competence in areas such as web development in libraries, integrated library systems, and the World Wide Web.

2. Objective of the study
1. To ascertain the level of computerization/automation of academic Libraries.
2. To determine the usefulness of ICT resources in academic libraries.
3. To determine the efficiency and effectiveness of ICT in academic library.
4. To determine how skillful and knowledgeable the staff are in the use of ICT resources.
5. v. To determine the challenges associated with the application of ICT in academic libraries.

3. Review of Literature
The study is based on review of primary and secondary literature which includes books, journals, documents, research papers etc. Relevant literature have been also collected and consulted through the internet browsing.

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4. Necessity for ITC in libraries

To speed-up accurate and reliable data transfer in future there is also a danger of non-availability of hard copies of documents, particularly to secondary sources that are available only on CDROM. Knowing this, continuing education about ICT for libraries is essential. Due to the escalation in prices of periodicals and books, no library can afford to acquire all the publications; resource sharing through networking is the only option. To participate in the network, computerization of libraries is a prerequisite. Many International databases like DIALOG, MEDLARS, INIS, AGRIS, etc. are delivering the information electronically. Unless the libraries are automated, there is no possibility for accessing the information from these global level databases. The literature in almost all the fields is increasing tremendously and in a multidimensional way. Because of this growth, manual bibliographic control is not feasible and ICT is needed. The information seeking behavior of the users is also changing according to their varied need. To meet these hanging needs, storage capacities of information and retrieval techniques should be improved. The quality, user friendless, effectiveness, reliability and regularity of library services can be much improved through ICT.

- To utilize the growing world of electronic information, application of ICT is necessary.
- With the help of ICT it is possible to gain local, national, regional and international reputation.
- To be able to provide round the clock access and service to users.
- To access experienced and expert individuals in my fields.
- To provide regular updates on topics of interest to users.
- To promote teamwork across geographical distance.

5. Components of ICT for Libraries

Technological change is becoming a driving force in our society. Information technology is a generic term used for a group of technologies. These technologies can also be grouped into three major areas:

- Computer Technology,
- Communication Technology
- Reprographic, Micrographic and Printing Technologies

5.1 Computer Technology

The wide spread use of computer technology has made dramatic developments in the information transmission process in very field of human life. Highly sophisticated information services ranging from elaborate abstracting and indexing services to computerized data bases in almost all scientific disciplines are in wide use all over the world. The current developments in computer technology include mini computers, microcomputers, personnel computers, portable computers, super computers, speaking computer with IQS. Seeing robots, microchip technology, artificial intelligence, software developments, C-ROM technology, machine-readable database, etc.

5.2 Communication Technology

5.2.1 Audio Technology: Due to tremendous improvements and inventions, older gramophone records are now dwindling and much sophisticated cassettes and tape records are emerging. The outmoded AM (Amplitude Modulated) radio receivers are being received by the modern FM (Frequency Modulation) receivers. Thus, the new audio technology can be used in libraries and information centers for a wide variety of, recreation, etc.

5.2.2 Audio-Visual Technology: Motion pictures, Television, Videodisc are the main contributions of this technology Videodisc is a new medium containing prerecorded information, which allows the user to reproduce this information in the form of images on the screen of a television receiver at, will. Videodisc technology offers high quality storage, image stability and speed of recall.

5.2.3 Facsimile Transmission (Fax): Facsimile transmission has been boosted by the adoption of methods of data compression made possible by compact, reliable and inexpensive electronics. During the initial stages, the average speed of facsimile transmission was found to be 3.4 minutes per page. This technology was slow it was replaced by micro facsimile- Satellite communication and fiber optics have increased the potential of facsimile transmission.

5.2.4 Electronic Mail: E-mail is the electronic transmission and receiving of messages, information, data files, letters or documents by means of point-to-point systems or computer-based messages system.

5.3 Reprographic, Micrographic and Printing Technologies

The technology of reprography made a big impact on the document delivery system. Most of the research libraries have reprographic machines and provide photocopy of any document on demand. Using reprographic and micrographic techniques, we can condense the bulky archives and newspapers and solve the storage problems. They also serve the purpose of preservation they help in resource sharing and save the time of users.

5.3.1 Micro Forms: Microforms is a term for all type of micro-documents whether they are transparent or opaque or in roll or sheet form. The verities of microforms are microfilm, microfiche, ultra-fiche, microopaques, cards, computer about microfiche / micro film (COM)

5.3.2 Roll-film (microfilm): It is a continuous strip of film with images arranged in sequence. It is available in 100 feet roll with 35mm width.

5.3.3 Microfiche: It is flat film having large number of images arranged in rows and columns. Standard sized microfiche of 4x6 inches accommodated 98 pages.

5.3.4 Printing Technology: Thousands of years ago, people recognized the necessity of keeping records of their daily activities. Paper was invented and the art of writing and record keeping came to be defined. At present lasers and computers have entered the field of printing. Computer printers are three categories; line printers, dot matrix printer, and laser printers. Laser printers are popular today.

6. Applications of ICT in Academic Libraries

Now a days there are several information communication

technology for various housekeeping, management and administrative functions of the library, different electronic and digital media, computer aided electronic equipment's, networks and internet has provided significant role in retrieval and dissemination of information and playing an vital role for modernization of libraries main of them are:

6.1. Library Automation: Library Automation is the concept of reducing the human intervention in all the library services so that any user can receive the desired information with the maximum comfort and at the lowest cost. Major areas of the automation can be classified into two-organization of all library database and all housekeeping operations of library.

6.2. Library Management: Library Management includes the following activities which will certainly be geared up by the use of these fast ICT developments, Classification, Cataloging, Indexing, Database creation, Database Indexing.

6.3. Library Networking: Library networking means a group of Libraries and Information Centers are interconnected for some common pattern or design for information exchange and communication with a view to improve efficiency.

6.4. Digital Library: A digital library is an assembled of digital computing, storage and communication machinery together with the content and software needed to reproduce, emulate and extend the services provided by conventional libraries based on paper and other material means of colleting, cataloging, retrieval of stored information and revolutionize our concept of the functions of a traditional library and a modern information center. Recently technological developments have dramatically changed the mode of library operations and services Modern ICT is impacting on various aspects of libraries and the information profession. Advancements in ICT and the wide spread use of ICT is resulting in digital information sources and digital media replacing and becoming the dominant form of information storage and retrieval. ICT also survives and makes true rules of Library Science 'every reader his/her book/information', 'Save the time of the reader', 'Library is a growing organism'. ICT with its tremendous information sources, rapid transmission speed and easy access ensures the satisfaction of the user with complex demand, break down the distance barrier and shortened the time required and ensure the right information to the right reader at the right time. It also increases and solves the library's demand of collection development. It is really an excellent tool for the Library information centers.

7. ICT Services
7.1. Inter Library Loan: Interlibrary loan is a technique by which one library lends materialindirectly to an individual through another library. In essence, there- fore, it Is merely a means through which a library may broaden its lending service to include those materials which are made available by other libraries. The technique of interlibrary loan, of necessity, entails a lending operation, but regardless of where the actual work is per- formed-circulation, acquisitions, etc.-the principle involved is one of reference: that is, to provide the library user as

completely as is possible with the material he needs. DELNET in India is a best example of providing interlibrary loan service to its member institutes.

7.2 Document Delivery Services: 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 DELNET 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.

7.3 Reference & Information Services: Some services such as SDI (Selective dissemination of information) or Current Awareness Services (CAS) and virtual reference desks, announcements of new acquisitions and other reader advisory services can be made easier through the internet. Users can have online interaction with the reference staff. The tools available on the internet such as table of contents journals, discussion forums assist library professionals in providing CAS services to the users. „Content Direct "by Elsevier, uncover a general commercial contents database, Ideal database of Academic Press are examples of current contents service. Ban LISForum of NSCI Bangalore, DEL LISTSERVE of DELNET is providing the latest information in the form of electronic digests.

7.4 Resource Sharing: A central union catalogue can be better managed through ICT; thus libraries can create and share bibliographic records and other information resources in digital format. 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.

7.5 E-resources Access: A variety 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 perceptual change resulting from right to use rather than physical possession, etc. Library users can access information of various types such as online databases, e-journals, e-books, government publications digitally through networked systems.

8. Advantages and disadvantages of ICT in libraries
Some of the advantages of information communication technology include:
➢ Access to unlimited and updated information from different sources
➢ Reforming and combining of data from different sources
➢ Speedy and easy access of information
➢ Reduce the workload of the library staff
➢ Collaboration and creation of library networks
➢ Avoid repetition of efforts within a library
➢ Increase the range of services offered
➢ Save the time of the users
➢ Improves the quality of library services
➢ Enhance the knowledge and experience
➢ Improve the communication facilities.

Some disadvantages of information technology include:
➢ Insufficient funds
➢ Inadequate trained staff
➢ Unemployment
➢ Operational costs are exceeding year by year

9. Recommendations
The application of ICT tools are increasing in Academic Libraries especially in Engineering College and Arts & Science colleges due to the development of technologies.
❖ The Academic Libraries must increase the Video Conferencing facilities which enables the users to maximize the usage of ICT based activities and services. □
❖ It has been observed that very few libraries are offering Video conferences it is due to fewer consortiums. If consortium with other libraries will increase the usage of Video conferencing will also increase.

10. Conclusion
New information technology will enable information services to carry out consolidation and synthesis of scientific information on a very large scale... Utilization of Information Technology in present libraries is optimistic to gain right information at the right time in the right place and at the right cost. Information Technology helps to progress the rank of the library and it condense the work stack of the library professions. Information Technology has broken the worldwide boundaries, new apparatus and methods help to provide better services to our clients. Inspite of tremendous advantages and advancement of information, it can be concluded that will supplement the traditional educational system but it wouldn't replace it.

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