

Information and Communication Technology (ICT) in Library and Information Science (LIS): *an Overview*

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Abstract- Information and Communication Technology (ICT) is a fundamental contrivance which is essential for survival in today's competitive digital era. The growth of information and knowledge is universally multidirectional and multidimensional. ICT is emerged as a great solution to libraries for managing and processing the information and knowledge. It is difficult to think that libraries are not using ICT (Information and Communication Technology) tools. ICT has changed the traditional manual libraries into modern libraries. The library professionals are seeing to cope with the utilization of new ICT based tools in Libraries. The emergence of ICT in Library and Information Science (LIS) has opened up new ways of acquiring, collecting, processing, managing and disseminating the information resources. Major reasons for such a widespread use of ICT in LIS field are the speed, accuracy, versatility and cost effectiveness involved with ICT. Information and Communication Technology has transformed the Library and Information Science and its services from print to electronic form global wise. The ICT has changed the scenario of LIS field. ICT has many advantages in LIS field but it is a great challenge too for libraries and library professionals. In this paper, the concept of ICT, advantages and challenges and its impact has been discussed.

Keyword— *Advantages, Challenges, Information and Communication Technology (ICT), Impact, Library and Information Science (LIS), Library professionals etc.*

I. INTRODUCTION

In the beginning of 19th century, libraries started falter due to information explosion and faced problem of catering and fulfill the demands of the users in a shortest possible time. Information and Communication Technology (ICT) emerged as a magnificent gift that has been adopted by libraries to provide their best services to users and to satisfy them. The ICT based services are provided by the libraries to their clients in minimum span of time. The libraries are reshaping, resizing, rejuvenating and refurbishing information products and services to deal with the challenges and demands of clients.[1] The scope of Information and Communication Technology is seen in management of databases, computer and language programming, system software development, application software development, computer networking, mobile application in learning and teaching, security of databases and information products, communication through SMS, email, fax, audio-visual aids, and video conferencing etc. ICT has become the necessity that is required as a prior condition for the proper functioning of Library and Information Science (LIS). To provide right information in a shortest possible time to user, it is not possible without ICT application in LIS. Due to ICT, it has become possible

to change print information in machine readable form i.e. digital form. ICT provides online access to information and its transaction too. Networking of libraries has become possible only because of the application of ICT in LIS.

Now it is easy to access e-books, e-journals and e- resources etc. The old concept of libraries as "storehouse of books" is totally changed to "Library and Information Centre". This is because of the application of ICT in libraries. The scene of traditional and manual library is totally changed to electronic and digital library. It makes easy to access the library products and services all over the world. To get latest information is not a geographical issue today. ICT is being used in various housekeeping activities of libraries like procurement of documents, technical processing, circulation process and dissemination of information. The users at their terminal ends with computer and internet facility are fond of information at their desks instead of visiting library physically. The concept of digital and virtual library came in reality only due to the application of ICT in Library and Information Science. The invention of "Computer" and "World Wide Web" (WWW) revolutionized the way of working of libraries and the status too. The use of technical devices and machines reduce lots of manual work and save the time of library professionals

and users too. It speeds up the tedious and repeatable jobs. Library and Information Science is a place where information and knowledge is gathered, processed and disseminate in print, electronic and digital format. Multimedia and Hypertext as a result of ICT are showing good efforts in producing libraries documents into digital format. Mostly used ICT tools in libraries are computer hardware, software, databases, networking, communication networks, programming, artificial intelligence, expert system,[2] storage devices, bar coding, RFID (Radio Frequency Identification) technology, printing and scanning devices and audio-visual aids etc. These ICT based tools helps LIS in providing comprehensiveness, security and accomplish status with the changing knowledge based society. Library and Information Science field becomes popular among the users when ICT is applied to their products and services. The development of the nation depends on relevant information and the relevant information is provided by libraries in various formats. Open access system, e-books, e- journals, e-list, printing service, bulletin board service, reference service, online document delivery service, e-newspaper clipping service, web-OPAC, Frequently Ask Question service, Help desk service, digital archiving service, online networking, mobile libraries, library blogs, library portals, library discussion forum and many more services make libraries user friendly on global level.[3]

II. OBJECTIVES

- To know the concept of ICT.
- To study about various advantages of ICT in Library and Information Science (LIS).
- To become aware of emerging challenges in LIS field.
- To study the impact of ICT on status of library and library professionals.

III. METHODOLOGY

Here, Descriptive Research methodology is used to collect and interpret information. Descriptive method focuses more on “what” of the research subject rather than “why” of the research subject. In other words, it describes the subject of the research without reveal “why” it happens. In this study, what is ICT, what are its advantages and impacts on Library and Information Science field are discussed. Finally the author has come to conclusion that ICT has totally changed the scenario of LIS field and what should be the measures taken for making library professionals updated and skilled.

IV. CONCEPT OF ICT

(Information and Communication Technology)

Information and Communication Technology is the merger of two technologies i.e. “Information Technology” and “Communication Technology”. So, it is not a single entity. It is the composition of two advanced technologies. ICT appeared in early 20th century. Using term ICT in place of IT is not universally acceptable. But it can be used as in the same sense of IT anywhere. [4] Firstly, we will try to know about IT. As defined in Oxford Advance Dictionary, IT is, “the study use of electronic equipment, especially computers for storing information”. Information Technology (IT) is the use of computer systems for storing and retrieving data. [5]

Secondly, we will try to know about Communication Technology. Communication Technology is the process of handling information and knowledge during receive and transmit through networks like LAN, MAN and WAN. So, IT deals with the using of computer hardware and software devices for procuring, processing and storing the information where as Communication Technology deals with the process of dissemination of information and knowledge.

According to the UNESCO, the term “ Information and Communication Technology” refers to forms of technology that are used to create, process, store, display, share and transmit information by electronically or online.[6].

Information and communication technology (ICT) is the application of technologies consisting of hardware, software, network and media for collection, storage process, transmission and presentation of information in textual, audio, pictorial and multimedia formats. [7] In context of Library and Information Science, ICT can be defined as the computer and IT based technology that can be used for the acquiring, managing, storing and dissemination the information to their users without any delay. It deals with providing library products that are required by the users at their terminal or desktop. With the application of ICT in libraries, remote access services are provided to users across the boundary or four walls of libraries.

Application of ICT tools in library and information system lead to sustainable development. The ICT resources that are used in libraries for sustainable development are Computer machines, library software, Internet facility, E-mail services, World Wide Web (WW or W3), printers, photocopying system, scanners, OPAC and Web OPAC, Video conferencing, DVD & CD ROMs, digital camera, multimedia technology, fax, intranet, mobile phones etc. [8]

V. ADVANTAGES OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN LIBRARY AND INFORMATION SCIENCE (LIS)

1. Provision of remote access to clients or library users through networked system- The application of ICT in LIS field tends to provide required documents through remote access. There is no effect of geographical or distance barrier. Users should have internet connectivity and computer system at their ends.

2. Provision of providing latest information and easy access to clients- Up-to-the minute information easily provided by the libraries to their users due to the ICT tools utilized in LIS. ICT act as leading edge technology used in today's modern libraries.

3. Solution for storage capacity of reading documents- Less storage space in library and more published documents create difficulty for the libraries to acquire and store all the publishing documents. For this, secondary storage devices like Compact Disc- Read Only Memory (CD-ROM), Digital versatile disc (DVD), magnetic tapes and discs, optical discs etc are used. It leads to cover less space in libraries and increase the storage capacity of libraries.

4. Provision of 24x7 library Services to users or round the clock access to users- Due to application of ICT in LIS, it becomes possible to provide library services uninterruptedly day and night to users. There is no obstruction of time and climate. LIS provides its services to clients 24 hours a day and 7 days a week.

5. Promotion of Library Cooperation and Resource sharing across geographical distances- Unavailability of required document by the user in one library does not obey the five laws of Library Science fully. With the application of ICT in libraries, it has become easy for one library to do library cooperation and resource sharing with the other libraries to fulfill the demand of user with required document. The bibliographic databases and the documents exchange among the libraries and the required document easily becomes the holding of that library. The development of the MARC (Machine Readable Catalogue), Web OPAC (Online Public Access Catalogue) and OCLC (Online Computer Library Centre) etc have enabled the accessing of information easily by resource sharing or library cooperation among libraries within or outside the countries. [9]

6. Provision of E-Current Awareness Service and E-Document Delivery Service online- Due to implementation of ICT in LIS, libraries are able to provide E- Current Awareness Service and E- Document Delivery to the users well in time. ICT helps e- Journal service providers, database producers and database aggregators to enhance document delivery service. Inter-library loan and lending system make an easy way to access current

information on the hand. Some examples are Inter-library Loan Service of OCLC (Online Computer Library Centre) and DOCLINE System of National Library of Medicine, USA.

7. Enhance easy way of Information retrieval- When user put any query, Graphical User Interface (GUI) provided by the library system and it tends to know the query of client and accomplish easy retrieval of information.

8. Reduce the cost of paper- The concept of paperless society is on the route. Various secondary storage devices help in reducing the utilization of paper. Many documents are saved in soft copy form. Reduction in the printing documents or reading materials lead to reduction in the cost of paper. It is economic in nature.

9. Save the time of library professionals and users too- Various manual and repeated jobs are done by computer and other IT machines in library. Most of the hectic job in daily routine of library is seen on the circulation desk i.e. issue and return of books. Now this job is done by the computer technology within seconds. In this way, it saves the time of library professionals and users too.

10. Integration of many libraries- Integrity in many libraries has occur due to the resulting of library networking through LAN (LOCAL Area Network), MAN (Metropolitan Area Network) and WAN (Wide Area Network).

VI. CHALLENGES FACED BY LIBRARIES

Whenever there is a new innovation, it will come with challenges and drastic changes. New emerging trend as ICT is challenging one for the libraries. The vogue of ICT in Library and Information Science is challenging situation in digital era. Many challenges are faced by libraries and staff members. [10] Some of them are given as under:

1. Lack of Infrastructure.
2. Insufficient budget for ICT infrastructure and installation.
3. Insufficient bandwidth.
4. Management of copyright.
5. Lack of skilled professionals.
6. Lack of IT and knowledge management experts.
7. Constant changes in the version of software.
8. High cost of IT tools.
9. Hard rules in system agreements.
10. Conversion of printing material into digital form.
11. Inadequate online security to library system.
12. Old and Changed LIS curriculum.

VII. IMPACT OF ICT ON LIS

a) Handling of large amount of information becomes easy- Increase in scholar publishing and information explosion, make difficulty for the library to handle it with the old manual system. So, ICT has changed the

- way of handling information and its storage and dissemination with the advanced ICT tools.
- b) Change in the role of libraries-** As per new trends are followed by many libraries in the world, the role of libraries totally get changed from mere a store house to modern digital library. Libraries have started to provide information to their users through internet on the computer or desktop. Virtual libraries provide virtual tour to the users. The users need not to go physically to the library. The users sit at their terminals of computer with internet facility and can virtually go through the reading documents on the shelves of library.
- c) Change in the role of library professionals-** Today's library professionals are not remain merely as custodian of libraries as seen in the past. They play various roles by providing different type and nature of services. Their role has been changed to facilitator, Information collector, Information manager, Information provider, Reference librarian, LIS expert, library manager, navigator etc.
- d) Emergence of Library Automation-** Most of the work is done with the help of machines like acquisition, classification, cataloguing, journal subscription, circulation etc. It reduces physical or manual work. Modification of traditional library services caused due to ICT in LIS. OPAC modified to Web OPAC. Availability of web based databases, audio-visual services, online current awareness service, online document delivery service, alerting service, online reference service, online circulation, online inter library loan service, online user orientation and education etc. are seen in Library automation.[11]
- e) Increase in Resource sharing and network sharing-** The information and needed document can be accessed from one library to another library through resource sharing and network sharing via computer, communication and information technology. [12][13]
- f) Improvement in the status of Library-** Due to application of ICT in libraries, the scenario of the libraries is changed from traditional library to modern libraries. Various types of libraries are seen today like automated library, electronic library, hybrid library, digital library and virtual library. So, adjoining of term Information Science to library has improved the status of library.
- g) Collection Development-** The early libraries are composed of only books. But after information explosion and emergence of information society, libraries started to acquire journals, periodicals, magazines, audio-visual aids etc. Due to introduction of ICT, the libraries now become information and knowledge repositories. The repositories improved the collection development in LIS and their importance has increased. [14]

h) Professional career development- Library professionals have the skills to attract different types of users with their inviting and smiling face. With competent ICT skills, they have bright future possibility. [15]

i) Development of Library networks and National and International System- ICT initiated the development of various library networks with their specialized features like OCLC (Online Computer Library Centre), DELNET (Developing Library Network), ERNET (Education and Research Network), NICNET (National Information Centre Network), INFLIBNET (Information and Library Network) etc. and many Information System like NASSDOC (National Social Science Documentation Centre), NISCAIR (National Institute of Science Communication and Information Resources), MEDLARS (Medical Literature Analysis and Retrieval System), INSPEC (Information, Service for Physics Engineering And Computing), INIS (International Nuclear Information System), NISSAT (National Information System For Science & Technology), AGRIS (International System for Agricultural Science and Technology) etc.

VIII. SUGGESTIONS

The study suggests and recommends many libraries to be well maintained, updated and equipped. Foremost, the proper funding should be provided to libraries every year on priority basis. Secondly, installation of computer hardware and software, well maintained infrastructure, useful electronic equipments in all the working sections of the library and skilled and trained staff are required. Internet facility should be provided for 24x7 hours. There should be availability of electronic and digital resources in collections of libraries to fulfill the demands of users. Faculty Development Programmes should be held once in a year to train the library staff with the recent trends and technologies.

IX. CONCLUSION

The invention of "Computer" and "Information Technology" revolutionized the way of working of libraries and their status too. The consequent application of ICT in LIS has totally changed the way of library operations to identify, collect, process, store and disseminate information. In the recent time, mobile phones are the suitable example of ICT based library that are seen in the hands of human, are used to access the library collection and required document without physical visit in the library. Social networking sites and blogs are utilized by many libraries for the promotion of their products and services. Many new trends in libraries are the result of application of ICT tools in libraries like Library 2.0 and Library 3.0. These are full featured and boundary less libraries that satisfy the five laws of Library Science. ICT in LIS as a field of study is challenging one. Time to time well defined curriculum,

workshops, fresher courses, seminars, faculty development programmes and conferences should be undertaken to skilled up the library professionals for keeping pace with the new developments in future. In this way, the skills and attitude of the library professionals can be developed positively without hurting their sentiments. It will ensure the development in the status of Library and Information Science field and professionals in this ICT world.

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