INFORMATION COMMUNICATION TECHNOLOGY (ICT) SKILLS FOR LIBRARY AND INFORMATION SCIENCE (LIS) PROFESSIONALS

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ABSTRACT: - *This article explores knowledge of ICT skills among library professionals including importance of ICT literacy for them. It also covers the types of ICT literacies among library professionals and explains how it is important for library development as well as self-assessment. In general, ICT literacy models are helpful for library professionals to generate awareness about ICT tools and techniques, selection of library automation software, a quick search of e-resources and searching online information as and when needed. It also focuses on the types of literacies like hardware literacy, software literacy and resource literacy.*

KEY WORDS – ***Information and Communication Technology (ICT), ICT Literacy, ICT skills, Library professionals, Hardware literacy, Software literacy, Resource literacy, Search literacy.***

1. Introduction

Information technology (IT) is a generic term that covers the acquisition, processing, store and dissemination of information of all types like textual, numerical, graphical and sound, etc., in all application areas e.g. banking, business, science and technology, library and information Centres. Current scenario of library and information centre is changing at a dynamic pace. It is a paradigm shift from print media to web media; from ownership of documents to access to information, intermediary to end user model and from the location of specific libraries to digital/virtual/hybrid libraries (Hussain, 2013). Information Communication Technology is used

with computer-based technology and internet to make information and communication services available to a wide range of users. ICT is used broadly to address a range of technologies, including telephones and emerging technology devices (Sharma, Singh, & Kumar, 2009).

As mentioned by Barik, Das, & Ramesh (2011), role of ICT in libraries is very important since the emergence of ICT is one of the wonderful gifts of modern science and technology which has brought tremendous changes. The application of ICT in has revolutionized the traditional concept of libraries from a storehouse of a book to an intellectual information centre. In order to cope up with the information challenges of the 21st century and to meet the changing needs of the users, more effectively and efficiently, the library and information professionals must possess adequate ICT skills. The modern libraries equipped with ICT means/tools provide better library services to users, more specifically. As rightly said by Bansode & Viswe (2016), professionals with right ICT skills and expertise will have plenty of opportunities in future and will be crucial to the management of technology intensive libraries in order to meet the ever changing demand of users.

2. Literature Review

ICT is any systematic design to gather process or distribute information. ICT may be any combination of tools and procedures that facilitate the generation, acquisition, storage, process, reorganize, searching, retrieval and electronically transmission of information. 'ICT literacy' means people are aware of ICT tools, its application in various sectors and use internet.

In the case study conducted by Ansari (2013) on ICT skill's proficiency reveals that library professionals are highly proficient in three skills: word processing, presentation software and web based functions and they are also moderately proficient in seven skills such as using hardware, system maintenance, spreadsheet, software development, web design, system analysis and design and networking. At the same time, Ansari (2013) has a concern about LIS professionals regarding the low conversant in digitization and imaging technique.

An analytical study conducted by Vijaykumar & Antony (2015) on women library professionals from major two universities in Kerala viz. Sree Shankaracharya University of Sanskrit (SSUS) and Cochin University of Science and Technology (CUSAT). The study found that the majority of women library professionals have an average level of skills on managing ICT based library services. The study also suggested that university library professionals need in-house training programmes to update their ICT skills.

Dhanavandan & Mani (2008) found that all the library professionals use some kind of ICT tools, particularly the Internet and mobile phones. The use of ICT by the female library professionals is

higher than the male library professionals. All the library professionals strongly believe that IT tools play a significant role in supporting and enhancing their professional and research activities.

Singh, Sharma, & Negi (2009) conducted a case study and found that the majority of Library and Information Centres of Noida have basic hardware facilities such as servers, computers, printers, photocopiers, internet connectivity, etc. At the same time it was observed that majority of LIS professionals were not properly aware of the use and operation of the ICT hardware.

A comparative study was conducted by Olatunji & Oluwadare (2011) at South-West, Nigeria found that the level of ICT awareness among the staff members is very high, but again unaware of technicalities and related applications.

A case study based on ICT literacy among the staff of Banaras Hindu University library system ranging from professionals, semi-professionals and non-professionals conducted by Singh, Agarwal & Lal (2009) reveals that an average number of library professionals are ICT literate. At the same time it was found that the semi-professional and non-professional staff is poor and has a low level of ICT knowledge and skills.

3. Types of ICT Literacies

There are a number of ICT Literacy types but as LIS professional one must acquire following ICT literacies for library development and self-improvement:

3.1 Hardware Literacy

It includes the level of expertise and familiarity with computers and other ICT tools. Computer literacy generally refers to the ability to use applications rather than to program. Individuals who are familiar with computer and those who are also computer literate are sometimes called power users. The level of familiarity with the basic hardware and *software* (and now Internet) concepts that allows one to use personal computers for data entry, word processing, spreadsheets and electronic communications are prerequisites of hardware literacy. The ICT tools used in libraries for various resources and services are Computers, Printers, Image Scanners, Barcode Scanners and Printers, RFID Technology, Mobile, Web Camera, LCD Projector, LCD TV, photocopying and many more.

3.2 Software Literacy

As rightly mentioned by Husain & Ansari, (2007), in developed countries computerization of libraries started in the 1940s and the first use of computer in library and information centres in India was reported in 1965 at INSDOC, now known as NISCAIR, New Delhi.

The main purpose of software literacy is automation of library operations. Modern library management system depends on library software. The selection procedure of software is a difficult task, because of various types of library software available in the market. These include proprietary, open source and in-house developed software for library functioning. Following Fig. 1 shows the Software Literacy model.

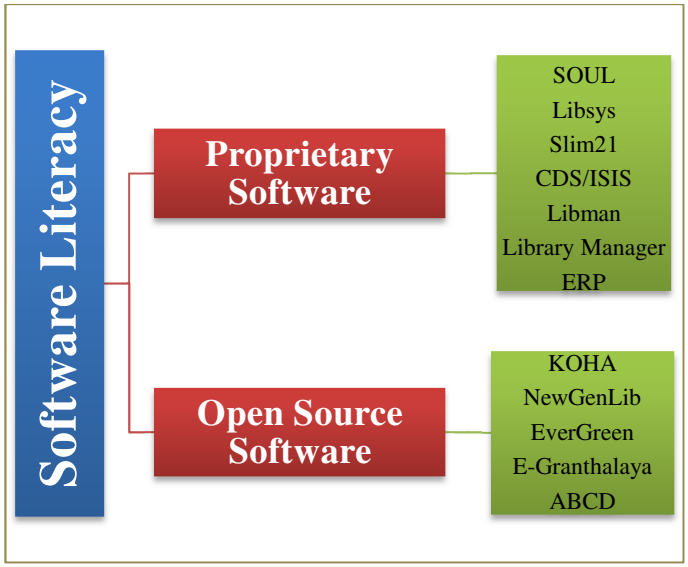

Figure 1: Software Literacy

The application of Information and Communication Technology (ICT) in the library is to attain efficiency, accurate reporting, and improved services. Core services of the library like circulation, cataloguing, acquisition, serial management, reference services and special collection readily benefit from automation ("Wikipedia," 2016).

3.2.1 Proprietary Software

Proprietary software is owned by an individual or a company usually the one that develop it. There are major restrictions on its use as its source code is always kept secret. While selecting a software Sharma et al., (2009) say, it is important that the software should have all the module e.g. acquisition, cataloguing, circulation, serial control, OPAC, and administration required to carry out all routine work of the library. It should also support Unicode for handling Indian and foreign languages. At last it must be user-friendly application. Some prominent propsoftwares successfully installed in libraries are LIBSYS, SOUL, LIBMAN, SANJAY, TLMS, ALICE, etc.

3.2.2 Open Source Software

With many Open Source Software (OSS) applications available for library and information management, many organizations have novel options for acquiring and implementing systems. According to Ukachi, Nwachukwu & Onuoha (2014) Open Source Software (OSS) are computer software that are made available to the general public with its source code and relaxed copyright restriction. It allows modification by users in line with their needs, requirements, and purpose of usage. OSS software are usually effective and often acquired free of charge. OSS implies to factors such as an exorbitant cost of proprietary software and library budgetary constraint.

3.3 Resource Literacy

Resource literacy is the ability to understand and use information in multiple formats from a wide range of sources when it is presented using computers. The users can access, locate, download, manage and use information in the appropriate formats as and when they need. Okiki (2012) has examined that the information explosion has greatly increased the number of electronic information resources. On the other hand, electronic resources have enhanced accessibility, increased usability / visibility, effectiveness and established new ways for users.

Sundareswari (2013) has stated that the e-resources are emerging in the form of e-books, e-Journals, e-articles, e-paper, e-thesis, e-dissertation, e-databases, and CD-ROMs, which are likely to be the alternative to the print media. Emerald, EBSCO, N-List, Scopus are some of the examples of online databases. Mostly, updated information is published in these e-resources. The familiarity and use of electronic information resources in the libraries for rapid development are necessary and important in the present scenario.

According to Joshi, Singh, & Jagriti (2015), E-resources like e-directories, e-reports, e-databases, documentations, e-books, e-journals and e-audio books are extensively accessed by MPs and staff in the Parliament Library of India as a part of the daily work.

Library resources are mainly of two types, print and electronic formats. The electronic formats are both offline and online resources. Off-line resources are Cassettes, CDs and DVDs whereas online resources are e-books, e-journals and magazines, e-thesis, e-dissertations, e-papers, e-repots, e-databases etc. Online resources are can be of types like the subscribed ones and the other ones are free open access. Some of the e-resources are:

3.3.1 Subscribed E-Resources

There are plenty of subscribed E-Resources are available for the end users. Some of the most commonly used e-Resources subscribed in India are:

i. ***N-list INFLIBNET*:** Project entitled "National Library and Information Services Infrastructure for Scholarly Content (N-LIST), being jointly executed by the UGC-INFONET Digital Library Consortium, INFLIBNET Centre and the INDEST-AICTE Consortium, IIT Delhi. It can be accessed by authorised users from registered colleges and universities under NLIST programme. N-LIST has access to 6,000+ e-journals and 31,35,000+ e-books.

ii. **EBSCO:** It offers resources to customers in from academic, medical, K–12, public library, law, corporate,

and government markets areas. Its products include EBSCONET, a complete e-resource management system, and EBSCO-host, which supplies a fee-based online research service with 375 full-text databases, a collection of over 600,000 plus e-books, subject indexes, point-of-care medical references, and an array of historical digital archives.

iii. **Emerald:** Emerald gives access to e-Journals, e-Books, Case Studies, etc. As on today, Emerald manages a portfolio of nearly 300 journals, more than 2,500 books and over 1,500 teaching cases. Over 270 Emerald journals are listed in Web of Science. Emerald adds over 150 new titles publishing each year. Now, Emerald also publishes more than 20 fully open access journals

iv. **INDEST Consortium:** Indian National Digital Library in Engineering Sciences and Technology (INDEST) Consortium was set up in 2003 by the Ministry of Human Resource Development (MHRD) after the recommendation of an expert group appointed by the Ministry. The consortium subscribes to over 12,000 electronic journals from a number of publishers and aggregators.

v. **J-Gate :** J-Gate is an electronic gateway to global e-journal literature, launched in 2001 by Informatics India Limited. J-Gate provides a seamless access to millions of journal articles available online offered by 13,187 Publishers. It presently has a massive database of journal literature, indexed from 47,445 e-journals with links to full text at publisher.

vi. **Web of Science:** It is a kind of access to multidisciplinary information from approximately 8,700 of the most prestigious, high impact research journals in the world.

vii. **DELNET**: DELNET is established with the prime objective to promote resource sharing among the libraries through the development of a network of libraries. One of the objectives is to coordinate suitable collection development and also to reduce unnecessary duplication wherever possible.

viii. **IEEE**: It is full text access to more than 4 million articles in engineering and technology. It covers 170+ Journals.

ix. **Manupatra**: It is India's premier legal information resource which is designed to be used by a wide variety of users across Legal, Educational, Finance, Tax, Accounting, Corporate,

Risk Management, Banks, Consulting, Government, Law Enforcement, Intellectual Property, Media markets and others.

3.3.2 Open Access E-Resources

Opens access e-resources are freely available for access, can be used and download from everywhere, anytime. There are no terms and conditions to access and use of e-resources. Some of the websites of free e-resources are as follows.

i. **DOAJ (directory of open access journals):** It includes a free, full text, quality controlled scientific and scholarly journals, covering all subjects and many languages.

ii. **NISCAIR:** NISCAIR is provides Science & Technology information and documentation services through myriad activities such as abstracting and indexing, design and development of databases, translation, library automation, providing access to international information sources, human resource development, consultancy services in setting up modern library-cum-information centres. Currently NISCAIR is having 20 e-journals which are available to users open accessible.

iii. **NCERT:** The National Council of Educational Research and Training (NCERT) is an autonomous organisation set up in 1961 by the Government of India to assist and advise the Central and State Governments on policies and programmes for qualitative improvement in school education. Free e-books up to 12^{th} standards are available for users to download.

iv. **Shodhganga:** University Grants Commission (UGC) mandates submission of electronic version of theses and dissertations by the researchers in universities with an aim to facilitate open access to Indian theses and dissertations to the academic community world-wide. It ensures easy access and archiving of Indian doctoral theses to help raise the standard and quality of research. There are over one lakh full text theses, synopsis from over 250+ universities.

v. **NPTEL:** It provides E-learning through online web and video courses in Engineering, Science and Humanities streams.

vi. **National Digital Library (NDL):** It is a pilot project to develop a framework of virtual repository of learning resources with a single-window search facility. It includes educational materials ranging from primary to post-graduate level.

3.4 Search Literacy

Search literacy is the expertise or technique which can be used for searching required information on the web. If the same title or keywords are entered in the search engine, number of information is available at a click, but all the searched information is not required for our need; since, all the search results do not match our needs. Searching tools and techniques help us to search proper right information at right time. Following are some of the frequently used search techniques and strategies:

3.4.1 Boolean Operators

Boolean Operators use simple words like AND, OR. NOT, or AND NOT as conjunction to combine or exclude keywords in a search, resulting in more focused and productive results. In general, they are used either to broaden or narrow down the search results. This saves time and efforts by eliminating appropriate hits that must be scanned before discarding. Using these techniques the operators can greatly reduce or expand the number of records. Eke, Omekwu and Agbo (2014) examined the Internet search strategies employed by library and information science students of university of Nigeria in their research and found it very effective.

- **AND: -** AND Narrows the search results having both the terms. Example: a search on ICT literacy and library professional which result in documents having both the terms.
- **OR: -** Search query using OR will result in all the articles where either term is available. A search on ecology OR pollution will have all the documents where either ecology or pollution keyword is available.
- **NOT or AND NOT: -** while searching first term is searched, any record containing the term after the operator is excluded from the results. Example: A search on India AND NOT Pakistan yield all documents where the keyword India appears excluding the documents having the keyword Pakistan.

3.4.2 Proximity search

One can use a proximity search to search for two or more words that occur within a specified number of words (or fewer) of each other in the databases. Proximity searching is used with a keyword or Boolean search. The number of * represents any intervening words in between. Example: “Library ** science” will result in all the documents like “Library and Information Science”

3.4.3 Phrase searching

Searching a group of words with double quotes directs the search engine to retrieve only the documents in which those words appear side-by-side in same order. Phrase searching is a powerful

search technique for narrowing your search results significantly.

Example: "Library School" will retrieve only documents with "Library School" and not the documents with "School Library" keywords.

3.4.4 Fuzzy Search

This is a type of search result by fuzzy matching. The search engine gives results that it predicts will be relevant, even when the terms used in the query does not appear anywhere in the matched documents.

Example: Searching ~food will retrieve documents on nutrition, recipes, cooking, etc.

3.4.5 Stemming

This means that the engine will search not only for your search terms, but also for keywords that are similar to some or all of those terms. It will search for all variations of the word. Example: 'read plan' will find pages with read, reading, reads, and plans, planning, etc.

3.4.6 Truncation search

Truncation places a symbol at the end of the word so you search for variant endings of that word. Example: A search on lib$ would result in documents with keywords library, librarian, liberalization, liberty, etc.

3.4.7 Wildcard searches

Wildcards also places a symbol but within a word to find variations on it. Depending on the search engine you use, different symbols like $ * ~ # ! : are used.

Example: A search from analy*e would find analyse or analyze

While actual search the operators may also use some following characters depending on the search strategy:

'+' To specify a must include term

'-' To specify a must exclude term

' ' To specify a must include phrase

( ) To specify a set of terms

: To separate the reserved word from the search terms

***** To specify term search (truncation)

4. Conclusion:

Librarians in the age of information technology have shifted their roles from the custodian of books to the provider of services oriented towards digital information resources. For delivering effective information services, it is essential that LIS professionals are well equipment with ICT infrastructure and get trained to use the ICT appropriately. They also need to possess requisite knowledge and skills to provide library services using the right resources. Library professionals need to be aware of all the ICT tools and search techniques for searching, organizing, and dissemination of information. ICT literacy models are helpful to generate awareness about ICT tools, selection of library automation software, a quick search of e-databases or e-resources and searching

of online information. One of the main reasons why ICT literacy is utmost necessary for library professionals is that, most of the information is now available in electronic format.

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