Review Article

ICT Skills Required for Librarians in Digital Era: An Overview

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Abstract

The rapid development of information technology is bringing about unpredictable changes in the field of library and information management. The leap from conventional library management system to electronic library management has paved way for great changes in the very structure and manner of library profession. The paper discusses the essential technology tools and techniques a library professional should possess in order to manage the academic libraries and the millions of information coming out day by day in this digital era. The paper points out the knowledge and skill a library professional should acquire for the successful application of information technology in libraries.

Keywords: ICT skills; Library professionals; Digital Library.

INTRODUCTION

In the early seventies library automation processes were started to automate and smoothen the flow of the library services. In the late nineties, Internet changed this automation process with the emergence of web based services. In the last 8-10 years, the web 2.0 has revolutionized information

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communication by faster information sharing, networking, and enabling multimedia services. The evolution of social network and social sharing has forced libraries to adopt this technology in their routine services to meet user's expectations and achieve immediate information delivery. Information professionals are now expected to be aware and capable of using and demonstrating emerging ICTs. Application of ICT is posing a particular challenge to library professionals in developing countries. There is need for additional training to augment the traditional skills so as to develop competency in ICT use. These issues make it necessary to study the ICT skills needed for the information professionals in this changing scenario. The ICT has changed our philosophy of serving the user by LIS professionals, due to the advancement of ICT application libraries are providing both prints as well as electronic and ICT based information services. Nowadays, the users can access the information without wasting any time with the change in trends of delivery or access of information from traditional methods to digital methods. Due

to digital transformation, LIS professionals must acquire the right skills to discharge their duties efficiently and must be trained in the application of various ICT tools like automation, Bibliographic standards, ICT based library services, web 2.0 skills, mobile information services, ILMS, Citation, IR, etc. The LIS professionals must learn and adjust themselves to a rapidly changing the environment by acquiring various ICT skills so that they can become valuable assets for the organization. Additionally, LIS professionals need to update their ICT skill on a regular basis to work effectively in the digital environment. Hence, LIS professionals have a role to play by acquiring ICT skills to discharge their duties. Now library professionals are being compelled to absorb the changes and pace with the advancement of new technology. In this magical era of computer and internet almost all the office works are performed with the help of computers. Almost all establishments like shops, banks, government offices, accounting firms etc. use their own software and gain rapid growth with the help of technology. The office workers in these organizations may be expert only in the software they use daily but they may not be computer experts. Organizations usually appoint or outsource a system expert to solve the errors in software/hardware/ networks etc. During the early years of computerization academic libraries also worked with the help of outsourced or institutional level appointed computer experts to solve the computer related problems. If the libraries had confined to the only responsibility of doing day today works i.e. completing the routine works easily with the help of computers like banks, shops etc. do even today, the same system would have been continued even today. But, when the idea of digital library is realized, libraries are being swallowed by computers; the implication of the term resources has become electronic resources and the library working with the help of computers has shifted to electronic library working within the computers. At this point, there were only two options before the library professionals; either to acquire knowledge and skill to manage electronic resources too in the computer or get ready to leave the field. Like the theory of survival of the fittest, only those who can work independently on computer and electronic resource management by using information technology tools and techniques can survive in the field hereafter.

EXPECTATIONS OF LIBRARY USERS

In the modern world's knowledge based society information is considered as a commodity and one can survive in information market only if high level consumer satisfaction is provided. Customer satisfaction is very essential for the success and existence of any kind of service or business firm. Even the slight changes in the interest of customer will cause big changes in the market. As information seekers, the library customer's tastes and attitudes have been greatly influenced by the advent of Information Technology. The latest studies show that students, teachers and researchers depend on and prefer e-resources to print resources for conducting their studies and research. Study on 'Meeting the needs of remote library users' shows the preference and demand for full-text online resources is a common trend among both on campus and remote students. Littman and Connaway conducted a circulation analysis and compared the usage of 7880 titles that were available in both Print and electronic formats at the Duke University libraries which provides information on the use of e-books and implication for collection development. The study shows that e-books received more use than print books. The study underlines the decline tendency of the use of print books. A survey on 'mobile phone application use by under graduate university students in Southern Mississippi reveals that hand held, internet ready devices that employ specific applications are increasingly being utilized for information seeking and 76 percent of under graduate students are using apps to find academic information. As the use of smart phone has become universal, the number of internet users also has considerably increased and people's bigotry against technology has been decreased. In the new generation, the new born children acquire skills of using mobile phone and tablet before they acquire their own mother tongue. Academic libraries have to serve a new community in which people get involved in technology to the extent that they can't live a moment without Information and Communication Technology.

PROFESSIONAL SKILLS

Professional competencies related to the special librarians' knowledge in the areas of information resources, information access, technology, management and research and the ability to use these areas of knowledge as a basis for providing library and information services. Professional competencies further include four major competencies, each supported with specific skills:

a. Managing Information Organizations.
b. Managing Information Resources.
c. Managing Information Services.

d. Applying Information Tools and Technologies.

Personal competencies, comprise a set of skills, attitudes' and values that enable librarians to work efficiently, good communicators; focus on continuing learning throughout their careers; demonstrate value added nature of their contributions; and survive In the new field of work. Skill denotes the ability to do a specific job well. The ability of a person to do a particular work in time with perfection can be called 'skill'. For library professionals general, specific and professional skills are indispensable. In the knowledge based economy of modern society, in which information is regarded as a commodity, only multi-faceted genius persons who are able to do many things at a time, can lead a library ahead catering the demands of the new generation. A library professional has to work as a manager who has great skill in resource management and customer relationship, as a good teacher or trainer when the orientation or training programs are conducted, as a good time manager who completes work time bound, as a project manager who shows proficiency in preparing and presenting new projects, as an excellent communicator whose approach is charismatic towards superiors as well as the subordinates, as an efficient evaluator. For such a library professional it is very essential to have different skills like general skills, management skills and professional skills. Library professionals have been performing their duties with sufficient skills for many years. It was during the last decades of 20th century, when information technology began to swallow library that ICT skill also became a compulsory skill for library professionals.

IT SKILLS REQUIRED FOR LIBRARY PROFESSIONALS

It is becoming increasingly apparent that library professionals, working within the technological environments, needed strong Information Technology Skills which extended beyond expertise in the use of automated library management systems for general housekeeping purposes. However, the actual nature and level of these skills was less clear. In converged services, i.e. those where computing and library services had been integrated, and in those services with strong IT focus, distinctions between 'computing' services and 'information' services were starting to blur, with library professionals tending to be deployed on the basis of their experience and skills, rather than their professionals qualifications.

Increased provision of workstations, the growth of electronic information resources, and the increasing popularity of the Internet, has led to a requirement for library professions who are confined with computers, and who are able to support and serve others. The digital era requires professionals who thrive on change, and who are proactive in terms of both their approach to work and their own professional development. All library professionals have to acquire I T skills, mainly in three areas of information technology, i.e. hardware, software and web applications. As electronic resources too have become part of library resources, the management of electronic resources becomes the responsibility of librarian.

HARDWARE SKILL

Every equipment and machines which are used to make computers functioning, and also those which are working with the help of computers including server, pc s, printer, document scanner, barcode scanner, RFID, photo copier, network switches, cables, connector, modem, UPS etc. can be termed in single word as IT hardware. The term hardware skill denotes one's ability to handle hardware of computer and related equipment including its purchase and installation. Only a skilled person in hardware can purchase and install computers and related equipment without fault. Library professional should be capable of checking them and ensuring their proper functioning.

SOFTWARE SKILL

Computer software is the single most important technology on the world stage. And it is also a prime example of the law of unintended consequences. No one in the 1950s could have predicted that software would become an indispensable technology for business, science, and engineering, that software would enable the creation of new technologies and the demise of older technologies. While selecting the operating system and other softwares one has to consider the capacity and type of desk top or server system, nature of job they are going to do using the system, policy of library, economic status etc. Knowledge in the software which is used in the computerized library or digital library is essential for library professionals. Only those who are well versed in general purpose software designed for common use as well as special purpose applications designed specially for library operations can handle the operations of modern library efficiently by exploring the unlimited possibilities of information

technology.

OPERATING SYSTEM

An operating system is a program that acts as an interface between the user and the computer hardware and controls the execution of all kinds of programs.
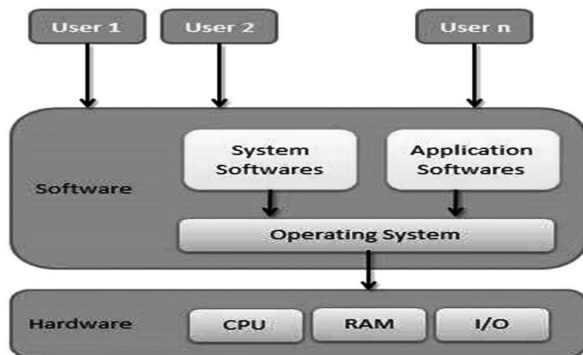
Following are some of important functions of an operating System.

- Memory Management
- Processor Management
- Device Management
- File Management
- Security
- Control over system performance
- Job accounting
- Error detecting aids
- Coordination between other software and users

Computers, servers, tablets, smart phones etc. require a system software to control and manage all hardware and software in a system which is known as operating system. Operating system is a set of instructions for performing basic task of computers such as receiving input from key board, displaying output in monitor, keeping files in storage devices and controlling system peripherals such as printer, scanner etc. Operating system keeps traffic control between different applications which are working simultaneously.

CONTENT DEVELOPMENT SOFTWARE

Switching from traditional learning resources to digital learning resources is a trend in education. Electronic content means the content developed by using computer or other electronic tools with the help of specific software. E-content is very popular in academic institution because of its flexibility of place, time and simplicity in handling. File creation and content development by using electronic communication tools and software is one of the important areas of library profession. It can be achieved easily to the satisfactory level of both academic and official communication using e-files through electronic media. It is essential for the library professionals to have sufficient knowledge and skill to use the general and specific softwares in order to create and edit different types of files such as text, image, slides, audio, video, animation etc.

PROGRAMMING LANGUAGE

Programming language is a set of vocabulary and grammatical rules for instructing a computer to perform specific tasks. It gives proper instructions to computer about how to work to provide various kinds of output. Knowledge in programming language which is used to create the software used in the library will enable the library professional to provide the computer based services in the easiest way. Open source softwares have gained great popularity now a days, and knowledge in programming language is very important for library professionals to do such works as software coding, editing and customization independently.

DATABASE MANAGEMENT SYSTEM (DBMS)

A Database Management System is the software system that allows users to define, create and maintain a database and provides controlled access to the data. A database is a logically coherent collection of data with some inherent meaning. The database is often used to refer to the data itself, however, there are other additional components that also form part of a complete database management system. This software application can be used to communicate with end users and interact with other software and packages. DBMS should be a part of all library management system and digital library software and librarian should have the ability to manage data using DBMS.

MULTIMEDIA

Multimedia concepts behind what is emerging today date back to over four decades to a series of visionary thinkers who foresaw the evolution of computers towards richer personalized devices

that would become an extension of the individual. In future devices available for individuals would be memex, a device in which one stores all his books, records, and communications, and which is mechanized so that it can be consulted with exceeding speed and flexibility. It is an enlarged intimate supplement to his memory. "The memex would additionally be an associative device, so that related items could be easily located."

RADIO FREQUENCY IDENTIFICATION (RFID) TECHNOLOGY

Libraries today provide books, of course, and other materials as well. Their wares include magazines, videotapes, CDs, DVDs, Video games and newspapers. The physical retrofitting of library materials is generally simple. Existing bar codes are scanned into a conversion station and programmed RFID tags are produced. Choosing a conversion workflow process is less simple. Some libraries tag all of their new books as they are added to the collection. Others start with subsections of their collection in order to get accustomed to the system and field test operations. A combined self-check conversion machine would make it possible to by pass formal conversional together. The conversion can happen as patrons check out materials, and the most-used elements of the collection will receive the fastest conversion. After about a year, libraries run a report to see what remains to be tagged and do those. The International Standard Book Number (ISBN) is an industry supported numbering system for books. It identifies the title and edition of the book. The number libraries code into the tag is not the ISBN number, borrower, however. Libraries use a unique, arbitrary identification number for each book, which keys back to the library's database to get its identity. This system has privacy protections, so no one without access to the library's internal computer system can scan the book to see what people are reading. Patrons wishing to check out materials set the items on a desk. The system reads the tags and displays the titles on a screen. Patrons touch the screen, receive a receipt, and leave the library. When they return books, they receive a receipt indicating the items returned. Smart bins scan the returned books and sort them into appropriate bins.

CONTENT MANAGEMENT SYSTEM (CMS)

Content management system (CMS) is a web based application intended to create, edit, publish, organize and maintain digital contents. CMS acts as a Graphical User Interface (GUI) by communicating with database through URL and making information in the intended form. Millions of digital information are coming out day by day. CMS has become one of the favorite applications of libraries as it helps in the preservation, storage and retrieval of ever growing digital resources in a web environment without the complexity of programming. Knowledge in content management system, which can be used to manage digital content or web content in an easy way, is indispensable for library professionals in modern digital era.

PLAGIARISM DETECTION SOFTWARE

Plagiarism means copying of another person's ideas, texts, inventions or other creative work or intellectual property and presenting it fully or partially as one's own original work. Plagiarism detection software is used to locate instances of plagiarism within a work or document. Plagiarism detection software is essential to detect instances of plagiarism in research papers and other works coming out from academic institutions or research and development institutions and also to make out the quantity of plagiarism. Library professionals shall have great ability and skill in using plagiarism detection software which is designed to find out plagiarism in a work, document or research paper.

REFERENCE MANAGEMENT SOFTWARE

Reference management software (RMS) is an application which provides the authors and scholars with the facility of a personal library in digital platform and keeps articles and other works and that can be retrieved with key word search facility and helps to prepare references by selecting necessary citation style. Research scholars and faculty members can make use of this application for sorting and storing articles and other resources in their topic area and also can get bibliographic citations automatically in the necessary writing styles. Academic library professionals must gain knowledge in Reference management software which helps the scholars and authors for reference and doing the bibliographic citation in different styles and format easily and keep digital papers with search facility.

DIGITAL LIBRARY AND DIGITAL REPOSITORY SYSTEM

Digital library is viewed as an electronic media

platform where the selection, collection, processing, preservation, storage and retrieval of information or documents in digital format are performed independently. Different types of information technology tools and techniques are needed to process the information, which are different in size, different in programming languages and in different file formats to suit the user. Library professionals should be well versed in digital library/ digital repository software used in digital libraries in order to manage resources in electronic format.

LIBRARY MANAGEMENT SYSTEM

The whole resource planning system of a library, which includes all materials, resources and activities of the library, can be called as library management system. Commercial/ Open Source Software packages are available to automate all the activities of a library management system. It is very important to select appropriate software, which suit the structure and nature of the library, to do all the little and large works. Integrated library management system is an application specially designed for doing all routine works in library with accuracy and great speed by using computers. Library professional should be proficient in this application.

WEB APPLICATIONS

As the best cost effective communication channel internet is used to do millions of business and information communication works. The World Wide Web is an international hypertext system that links together millions of documents. A hypertext link is a word or a picture, which requests a different file from the Internet when you click on it. Hypertext markup language (HTML) is a collection of tags, which is used to create formatted hypertext documents. A Web page is a document created using HTML. A website is a collection of related pages. Web pages and sites can be stored on the hard drive of a local computer or a Web server on the Internet. A Web browser is a program that displays the Web pages it retrieves. Popular browers include Microsoft Internet Explorer, Netscape Navigator, Mozilla, and Konqueror. Library professionals must gain sufficient knowledge and skill in web applications and web technology in order to make the remote access possible using internet browser and web technology, to give the IT based services including web OPAC, and to perform other online jobs in the best possible way.

MACHINE LEARNING

Machine learning is only part of what a system required to become an Artificial Intelligence. The machine learning portion of the picture enable an Artificial Intelligence to perform these tasks.

- Adapt to new circumstances that the original developer dint not envision.
- Detect patterns in all sorts of data sources.
- Create new behaviors based on the recognized patterns.
- Make decisions based on the success or failure of these behaviors.

The use of algorithms to manipulate data is the centerpiece of machine learning. To prove successful, a machine learning session must use an appropriate algorithm to achieve a desired result. In addition, the data must lend itself to analysis using the desired algorithm, or it requires a careful preparation by scientists.

ARTIFICIAL INTELLIGENCE

Artificial Intelligence is concerned with intelligent behavior in artifacts. Intelligent behavior, in turn, involves perception, reasoning, learning, communicating, and acting in complex environments. Artificial Intelligence encompasses many other disciplines to simulate the though process successfully. In addition to machine learning, Artificial intelligence normally includes

- Natural language processing
- Natural language understanding
- Knowledge representation
- Planning in the form of goal seeking
- Robotics

SECURITY SOFTWARE

Software designed to provide sufficient security to the data saved in the computer, computer network and other activities in computer is called security software or Antivirus software. Security software is essential not only to protect computers, computer network and the data saved from cyber-attack, but also to keep the valuable information saved in computer without allowing any leakage. The selection of antivirus software depends on the capacity of computer and the nature work it does. Data encryption software to protect the data saved in the computer, Firewall software

to prevent intrusion through internet/network, Spyware removal software to prevent the spyware of data and activities performed in a computer etc. are available for different types of needs. A single software package for all these activities can also be used. Library professional should be proficient in security software.

CONCLUSION

ICT provides libraries an opportunity to give value added information services and access to a wide variety of digital based information resources to their clients. In this current situation, whereby ICT are being continuously updated, and the traditional formats are being replaced by digital formats, regular training for the library professionals in changing technology is inevitable. In-house training programs are more effective in libraries. From the present survey it is clear that most of the ICT technologies which are taken for this study are not yet been introduced in the Kerala University library system. Therefore the library professionals are not in a position to use these technologies in their work. This will create a low level of technological skill development among the professionals working in this library system. Concerning the implementation of the technologies, lack of support from the authority is the major issue in university library. The study concludes that the university library needs proper ICT infrastructure and training to the professionals in using the digital resources effectively.

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