Use of Information Communication Technology (ICT) and Library Operation: An Overview

Bhoi, Narendra Kumar
Junior Research Fellow
DRTC, ISI, Bangalore
narendrakumarbhoi@gmail.com

Abstract: This paper discusses the different dimension of the ICTs. It gives an awareness of technology in library and why there is a need to understand the use of ICT in the library for rendering enhanced library services and information to users. The current study highlights the areas where ICT can be applied. Basically, the paper explains different technologies and their use in the library operation. How library services are prompted with the use of technology like RemoteXs, RFID Technology, QR Code, etc. have discoursed in the study. The present study discusses various library operations using library automation. In this paper, the benefits of institutional repositories have been discussed for archiving the library resources. The very purpose of this study is to express the usefulness of the different ICT for quickest and approachable information dissemination.

Keywords: Information Communication Technology (ICT); Housekeeping Operation; Library Service; Library Automation; Library Operation; QR Code; RFID Technology; Social Media; Digital Libraries

1. Introduction

The vital activities of libraries comprise collection development, reference services management, document delivery service, access to organised collections held by the library and assist users in information search and retrieval (Husain & Nazim, 2015; Cholin, 2005; Malhan, 2006). There is the basic essentiality of information technology to manage the huge collection of library. It is indispensable to use modern technology to make library services faster. Libraries are facing a new generation of online users who are technologically savvy and integrate information access and use in all spheres of their lives to an unprecedented degree (Thomas & McDonald, 2005). Gradually, generation is changing with the time and the present generation's library users are too passionate with the technology. It is well known that all the success depends upon the satisfaction of the library users. So, in the present scenario the quickest library service is more approachable through the world-wide web and internet (Berners-Lee, Cailliau, Groff, & Pollermann, 1992). To provide information to the 'right users' at 'any time', from 'anywhere' in the 'right way' (Fischer, 2012) is possible using web based technological settings.

Tremendous development has been seen in the field of Library & Information Science due to the faster growth in technology. In past few decades, with the use of internet and technology, the library work has become very fast. To satisfy the needs of library users, speed and accuracy is the most two important dimension. Basically, Information and Communication Technology (ICT) enhances the workflow of the library which helps reducing manual work, with this, it proliferates the library services. One of the most prominent advantages of ICT is to provide ICT-based information services to meet the users' demands (Woodward, 2009). Emerging ICTs have changed traditional libraries into knowledge centres and librarians function more like consulting information engineers or knowledge managers (Sampath Kumar & Biradar, 2010). The modern technology has carried momentous changes in different aspects of library

management. From housekeeping operation to users management, have been largely achieved through the applications of internet and library software. Basically, ICT is used in libraries, efforts to provide various services, such as - access to OPAC, library databases, automated circulation of library materials, etc. Hence, ICT services have greatly impacted on each sphere of academic library activity as well as giving an opportunity to provide value-added information services and access to a wide variety of digital-based information resources to its users (Ghuloum, 2012). Now-a-days, information technology (IT) is widely used in different sectors; it is also extensively adopted in the field of library and information services to reduce costs, enhance operational efficiency, and most importantly to improve service quality and customer experience (Law, Leung, & Buhalis, 2009).

2. Literature Review

Recent advances in IT have not only increased tremendously the ability to access, store and process information within the library but also have brought significant changes in the concept, organisation, functioning and management of library and information systems (Peyala, 2011). The IT revolution has facilitated the processes of searching for and recovering information; ICT improves the efficiency of organizational management processes and provides new ways of improving the capacity of response to its users (López, Peón, & Ordás, 2009). Use of ICT applications can assist in creating, storing, transferring and using tacit and explicit knowledge (Okumus, 2013). Buarki, Hepworth, & Murray (2011) have carried out a study on "ICT skills and employability needs at the LIS programme Kuwait: a literature review". In study, authors reviewed an enormous number of ICT related literature. They have concentrated on information and communication skills (ICT) of library and information science students in global LIS education and compare them with those skills needed by the job market in Kuwait. They found that, "ICT skills have been recognised as essential qualities for LIS graduates' employment". Therefore, at present days, ICTs skills have become the prerequisite and central attention to judge a candidate for the employment. Anunobi & Edoka (2010) have discussed how university library plays a pivotal role as an information providing system; it supports teaching, learning, and research with information materials of various types. Amongst the different information materials, serials or periodicals are most obligatory mainly for faculties and researchers. Earlier, the serials operation was manual; but with the development of ICT the acquisition of serials or periodicals became easy as well as its retrieval. In line with the above perspective, users' curiosity for seeking information changed from print to e-resources. Haneefa (2007) investigated the application of information and communication technologies (ICT) in special libraries in Kerala, India. In the study, it is found that the library catalogue was the utmost popular area for automation. The investigation revealed that, inadequate ICT infrastructure as the major cause of users' dissatisfaction. The study has recommended to enhance library automation and to focus on effective and efficient application of ICT. Chandrakar & Arora (2010) provided the Indian approach on the use of information technology on copy cataloguing from different trusted sources such as IndCat, and catalogue of Library of Congress. So, the overall review illustrate that, the appropriate use of ICT in library is much essential. It is also consider that the proper infrastructure and ICT-enabled environment can provide better and faster services to users.

3. Objectives

The objectives of the present study are as follows:

- To provide an awareness of the transcendent use of ICT for quick library operation
- To guide the library professional regarding various workflow of housekeeping operation using ICT
- To provide a pathway on the different features of ICT for web cataloguing and classification
- To create consciousness among library professional and users on the use of OPAC and WebOPAC as a single search platform to library resources

4. Use of ICT Tools

The emergence of the information revolution as championed by information and communication technology (ICT) has enabled libraries to devise viable strategies for improved service delivery (Igwe, 2010). Library uses various technologies to provide information to its users. Followings are the some of the ICT tools which are basically used for different communication purposes:

4.1 Communication Technology: Email is the most effective way of formal communication; it is the best system to exchange the messages and information in electronic format. Revolutionary changes have been seen in communication, because different types of information such as personal message, letter, article, computer programming files, pictures, sound, etc. are being possible to send or receive from any corner of the world within some fraction of second. At present, this is the most useful tool for different types of communication (personal, official communication, etc.). This tool can be used to provide the required information at the right time. At present, Libraries are using this live tool to serve the library users; through this, renewal or return (check-in) of library materials is basically asked. It can also be considered as a medium for faster information.

- **Voice mail** is the new and innovative emergence of mail technology. We can also say it as an alternative to email technology. It helps to send the mail immediately through the voice.
- **Telephone** is used for personal contact of the users. Generally, users ask their queries regarding the resources and availability of the reading room. Even, they use the telephone for advance booking of carrels for reading and research purpose.
- **Fax** (short for *facsimile* and sometimes called *telecopying*) is described by Rouse (2006) as "the telephonic transmission of scanned-in printed material (text or images), usually to a telephone number associated with a printer or other output device. The original document is scanned with a fax machine, which treats the contents (text or images) as a single fixed graphic image,

converting it into a bitmap. In this digital form, the information is transmitted as electrical signals through the telephone system. The receiving fax machine reconverts the coded image and prints a paper copy of the document". This technology helps us for providing various services, such as to send official letter, communicate with the vendors, etc.

- **Videoconferencing** (or video conference) is explained as a "means to conduct a conference between two or more participants at different sites by using computer networks to transmit audio and video data. For example, a point-to-point (two-person) video conferencing system works much like a video telephone. Each participant has a video camera, microphone, and speakers mounted on his or her computer. As the two participants speak to one another, their voices are carried over the network and delivered to the other's speakers, and whatever images appear in front of the video camera appear in a window on the other participant's monitor (Beal, n.d.)". This tools is used for the various purpose of the library activities, such as to conduct user orientation for students available at remote places. Basically, when students are out of the campus and they study in other universities under the student exchange programme, that time, it is essential to use this technology to guide them about the use of resources.
- **Internet:** This is the most important component of ICT. It is basically a network of networks that performs the connectivity among the computers. Internet provides the medium for communication using different online tools.

4.2 Remote Control Technology: Remote control provides a platform to work with a remotely located computer system. It is a great development in the field of technology. By using this technology, one can easily implement any kind of services sitting far away from the destination. This ICT is generally used for remote control, online meeting, desktop sharing, web conference and file transfer from one computer to others. One example of remote control software is TeamViewer.

- **RemoteXs Technology:** Eclat Engineering Pvt. Ltd. (n.d.) defined RemoteXs as a "single-window Platform to access all subscribed e-resources anytime anywhere. It has an ability to provide secure access to scattered e-Resources of the institution, bringing them under one umbrella, along with subscribed e-Journals, eBooks, and all other e-Content. This technology has empowered institutions in systematically imbibing research values among faculty and students and take right steps in creating a knowledge-base of their own". This technology is very much helpful, where students are outside the campus and wanted to use their institution's resources for research and learning.

4.3. Social Media: Social media like Facebook, Twitter, Blogs, etc. have become the central focus for quickest information dissemination. Most of the libraries are using these social media for the promotion or marketing of their e-resources. Basically, Blogs are used to disseminate short communication of library, whereas Facebook has become most useful ICT tool for every kind of information dissemination. Now, Facebook live plays a very significant role for telecast the current ongoing programme.

5. Library Security: The technology has a great contribution in the security of library through computer after having been civilized various technological processes. It can provide great security for the reading material of the library. This security arrangement is provided by applying RFID technique.

5.1 RFID Tehnology: New technology has changed the way of library transaction (check-in and check-out). Libraries are providing ICT-based library services to increase the possible ways of fast and user-friendly services. One of the best invention of technology for library is the 'Radio Frequency Identification' (RFID). Nowadays, libraries are adopting RFID technology to provide enriched and efficient library services. This technology achieves the fourth law of library science, (i.e. 'save the time of the users') by providing quick and effective services (Ranganathan, 1931).

5.2 Closed-Circuit Television (CCTV): CCTV stands for Closed Circuit Television and also known as video surveillance (Kumar & Svensson, 2015). This technology plays an important role in the library management. Through the help of CCTV librarian can supervise the whole activities of libraries. It helps to look after the staffs as well as the users.

6. Quick Response (QR) Code Technology: Walsh (2009) has discussed as "QR codes can be used to encode various sorts of data when used for mobiles, most typically text; uniform resource locators (URLs); phone numbers (prompting your phone to call the number); text message and number (prompting your phone to text the number); and contact details (vcard). The QR readers most reliably work with the text and URL options, particularly as some of the providers of the software also provide hosting services. In hosted solutions, QR codes generated through their software link to a re-direction link on their site, providing data on traffic from a particular code to their customers". Xu (2014) has described the method as "generating a single QR Code is simple. There are many free QR Code generators available online, such as Kaywa, Qrstuff, Goqr, Qurify, Delivr and Invx. Google offers two convenient tools to create an individual QR Code. Google URL Shortener allows one to shorten a long URL, and at the same time, it generates an accompanying QR Code for the shortened link. The accompanying QR Code can be downloaded by simply adding .qr at the end of the shortened link. Another tool is Google Chrome QR Code extension, which enables a user to create a QR Code while visiting a Web site. Many online QR Code tools, like Qrstuff, allow batch creating QR Codes, but they usually require users to pay subscription fee". QR code is very simple to use; at present days, it is indispensable to use for quick retrieval of library materials.

7. Digital Library: The base of digital library is computer and computer network because the reading material cannot be processed in the digital material without the computer and even no published books can be modified to digital form. In digital libraries the entire reading material like PDF, HTML, Audio, video, and services etc. also depend on computer and network.

- **Archiving, Preservation and Digital Repository:** It is a very difficult task in the libraries to preserve and archive manuscripts and ancient write ups and make those secure for future use. This work is being carried out with the help of computer, scanners and storage device, with the help of computer published writes ups can be modified to digital form and then can be stored in the form of computer hard disk and other media like CDROM, DVD etc.

Digital Repository software goals to provide a managed environment to store and retrieve digital objects, such as documents, images, audio/video clippings and their metadata. Repository software usually includes tools to allow curators and users to exploit the stored objects and their metadata. Variety kind of digital repositories are being created today to serve the different communities information needs. To create a digital repository one needs digital repository software (Sastry & Reddy, 2010). There are many software to build digital repositories like Dspace, Eprints, Greenstone, etc. Dspace is much popular among the institutional repository software because of its simple workflow and consistency. It provides a best platform to archive the digital content. User community can be benefited using the institutional repository for research and learning.

8. Resource Sharing:ICT can be used for resource sharing among libraries and information centres. It provides a great prospect for sharing both the human and material resources of a library with others library. The role of technology is very much significant for cooperative acquisition, cooperative processing (cataloguing and classification), exchange of information materials (e-resources), joint publication, networking, joint training of personnel, interchange of staff for seminars, and workshops (Igwe, 2010).

9. Use of Library Automation Software: Library automation is the excellent way of reducing the human involvement for library services. The aims of the current automation technology is to provide maximum services in minimum time and lowest cost. Library automation is the application of ICTs to library operations and services. Many library automation softwares are available for library operation such as Libsys, Koha, SLIM21, etc. The functions of the software are to automate the library systems which covers acquisition, cataloguing, circulation, serials management, stock verification, etc. ICT is used in various library housekeeping operations as well as for different library activities and services. The details use of ICTs are as follows:

9.1 Acquisition: With the help of web, acquisition work has become very much simplified. Order placing, duplication checking, price checking etc. are done very effectively using ICT technique. Receiving suggestions or demands and placing the order for purchasing library materials have become easy through the online. As publishers and vendors are available through the website, such as Amazon, Flipkart, Infibeam, etc. the quantity of workload has reduced and due to this the time can be saved and make it applicable to the other services. Invoices can be downloaded from the Websites that make service faster and avoids postal delay. E-mail helps in sending reminders to the publishers, vendors and even to the borrowers of the books (Antherjanam & Sheeja, 2008).

9.2 Cataloguing: There has always been awareness among librarians that without cataloguing and classification, the goal of making materials and information resources available would have been difficult. The advent and use of ICT has made it possible for remote libraries to access the huge databases of big libraries in developed countries for the purpose of adopting or adapting their bibliographic data for their own library use; and indeed the online catalogues have transformed the landscape of cataloguing and classification (Adeleke & Olorunsola, 2010). With the help of Internet and different web-sources, the cataloguing and classification work has been stress-free. The organisation like Library of Congress has made the work possible to classify or catalogue a resources in the minimal time. The LC online catalogue is a database of records representing the vast collection of materials held by the Library of Congress.

The online catalogue provides cross-references, notes and circulation status, as well as information about library materials still in the acquisition stage. LC catalogue records' information of different resources (books, serials, manuscripts, cartographic materials, computer files, sound recordings, music, etc.) are publicly available and it can be easily used for importing or copying data. All the functions of cataloguing have become possible through the use of library automation software. Importing bibliographic records from trusted online sites such as 'OCLC World Cat', 'Trove - National Library of Australia' have reduced a huge amount of time for cataloguing. Importing metadata through MARC format has made easy to the process of cataloguing and make it available as soon as possible to the users. Resources such as book, microfiche, audio, videocassettes, CDs, pamphlets, and theses etc. are catalogued through importing bibliographic records; required fields are edited manually as per the library requirement. Automation software gives update to the user about the progress of the library materials. After the processing of books or any requested materials, the automatic reminder is sent to the users about the availability of books.

9.3 Classification: With the technological development, the classification work has been possible through online tool. There are many online catalogue records available from where one can get the whole bibliographic record of the library resources. Along with the record, we can also get the classification number in the catalogue record. British Library catalogue, Trove-National Library of Australia's catalogue, Library of Congress's online catalogue can be used to search the catalogue record and data can be copied for own catalogue preparation. These libraries provide classification details in their catalogue record, but there are also some online resources where library resources/materials can be classified. OCLC classify, LOC classification web and WebDewey are the examples of online classification tools.

9.4 Serial Control: Serials or periodicals are the backbone of the library. Automated serials management gives quickest information access about the particular resources. Below mentioned tasks can be accomplished through the software for serial control:

- Current holdings status
- Tracing missing *volume and issue*
- Preparation of budget for periodical subscription
- Preparation of periodicals list and its verification
- Online Letters to publishers, vendors, etc.
- Processing of online electronic magazines and receiving copies of the periodicals
- Preparation of New arrivals

9.5 Circulation: The use of electronic gadgets such as computer, barcode scanner and the library management software helps to perform circulation routine operations in an easiest and quickest way. After the invention of barcode technology, library transaction has become faster. Nowadays, for any type of communication we depends on the internet, email, telephone, etc. These technologies are also used in the library for the day to day activities of the circulation. Basically, the following duties are performed in the circulation by using ICT:

- Issue, returns
- Overdue reminder
- Renewal
- Reservation of books/documents
- Membership registration
- User guides
- Daily check-in and check-out statistics

9.6 Stock-taking/Verification: The use of the computer in stock verification is the most important. The verification of the stock is carried out with the storage of library through the database in the computer. Stock available in the library is scanned through RFID reader/barcode scanner and data are collected. These collected data are compared with the available data in automation software. In this way, how many books have lost we can find out.

10. ICT and Library Services: The following library services can be rendered using information and communication technology (ICT):

10.1 On-Line Public Access Catalogue (OPAC):ICT has revolutionized the practice of cataloguing in the library. Using OPAC users can see the holdings of the library collections. It reduces the cost of maintaining a library catalogue. It also eliminates pen and paperwork, along with it helps in the preparation of union-catalogue. OPAC is the easiest way to get the information of collection, weekly new arrivals and other recent addition to the libraries.

10.2 Reference/ ILL Service: By using computer and internet technology, the reference service has become very simple. Various types of information resources like the encyclopedia, directories, dictionaries, databases, online library catalogues, maps, biographies, patents and online information resources are available on the internet which can be used to provide required information to the users.

In the reference section, queries are answered through the telephone. For ready reference service, library staff uses Internet and E-mail facility. The computer has provided a great promptness to reference section. The role of technology in reference services are as follows:

- Library staffs fulfill the demands of the users through various electronic resources like database, library catalogue database, directories etc.
- In reference service, services are also provided to the users regarding information available on the internet after getting delivered through the computer.

10.3 Reprographic Service: Reprographic technology is used for the reproduction of the documents. Using technology, the photocopy and the reproduction of the documents has become very easy and accessible. In this technology, printed documents are converted into digital form, then photocopy is prepared. For the same, computer scanner and software is required. This service is provided to library users for photocopy of some pages of books, journal articles or other materials.

10.4 Selective Dissemination of Information (SDI) Services: Hensley (1963) stated "SDI involves the use of the computer to select from a flow of new documents, those of interest to each of a number of users. This process may be thought of as the inverse of information retrieval. In information retrieval, a user precipitates a search of a file of documents. In SDI a document precipitates the search of a standing file of user interests". Through the computer, the profile and document of user are prepared and aligned. As per the need of the users or area of interest, various online databases, electronic resources and other materials are viewed and selected; finally required information is sent to library users.

10.5 Document Delivery Service: It is difficult for the library to procure every type of resources published across the globe because of financial constraints. So, the exchange of library resources such as books, journals, etc. among the libraries are very much essential. To overcome these problems computer and the internet have got a great contribution in DDS. Through this medium first document are converted into digital form after that these can be received at any place by users through electronic mail. Besides, the storage reading material like electronic periodicals, documents etc. can be disseminated to users on demand.

10.6 Bibliographic Service: Through the computer, bibliographic services have become convenient. Nowadays, libraries and publishers are providing bibliographic service to the library users. Bibliographic software such as EndNote, RefWorks, Zotero and Mendely are very much helpful to compile the list of references for the research work.

10.7 Translation Service: Mechanical translation is carried out with the help of ICT. For this purpose, various online tools like Bablefish translator and Google translator can be used to make translation from foreign languages to English and vice-versa.

10.8 Database Search Guide: At present, databases have become the central focus for exploration of varieties of the research problem. Researchers are using databases hugely for their research work. Searching and retrieving the online resources or data from the database has become very easy in the ICT environment. Generally, libraries provide the database searching guidance through the library website. The search guidance helps to researchers and faculties for their research and learning.

11. Conclusion

Effective application of information technology in library transmits users' satisfaction. The present scenario demands the updated technology for the faster and approachable library services. Gradually, new technologies are developed, consequently there is the need to develop our skills and capacity to provide enhanced library services. Library resources must be used at a large amount. The successfulness of a library and the library professional always depends on the quality of the service. The emergence of ICT is the new paradigm to extend the level of library operation and services. So, it is inevitable for the library professionals to be updated with the technology for the own existence.

References:

Adeleke, A. A., & Olorunsola, R. (2010). ICT and library operations: More on the online cataloguing and classification tools and techniques in Nigerian

libraries. The Electronic Library, 28(3), 453–462. https://doi.org/10.1108/02640471011052025

Antherjanam, S. D., & Sheeja, N. K. (2008). Impact of ICT on Library and Information Science: Major Shifts and Practices in CUSAT Central Library (pp. 35–43). Presented at the 6th International CALIBER-2008, University of Allahabad, Allahabad: INFLIBNET. Retrieved from https://dyuthi.cusat.ac.in/xmlui/handle/purl/4461

Anunobi, C. V., & Edoka, B. E. (2010). Use of ICT facilities for serials functions in Southern Nigeria Federal University Libraries. Library Philosophy and Practice (e-Journal), 355.

Beal, V. (n.d.). What is Videoconferencing? Webopedia Definition. Retrieved September 7, 2017, from http://www.webopedia.com/TERM/V/videoconferencing.html

Berners-Lee, T., Cailliau, R., Groff, J., & Pollermann, B. (1992). World-Wide Web: The Information Universe. Internet Research, 2(1), 52–58. https://doi.org/10.1108/eb047254

Buarki, Hanadi, Hepworth, Mark, & Murray, Ian. (2011). ICT skills and employability needs at the LIS programme Kuwait: a literature review. New Library World, 112(11/12), 499–512. https://doi.org/10.1108/03074801111190392

Chandrakar, R., & Arora, J. (2010). Copy cataloguing in India: a point-of-view. The Electronic Library, 28(3), 432–437. https://doi.org/10.1108/02640471011052007

Cholin, V. S. (2005). Study of the application of information technology for effective access to resources in Indian university libraries. The International Information & Library Review, 37(3), 189–197. https://doi.org/10.1016/j.iilr.2005.07.002

Eclat Engineering Pvt. Ltd. (n.d.). RemoteXs. Retrieved from http://www.remotexs.in/remotexs

Fischer, G. (2012). Context-aware Systems: The “Right” Information, at the “Right” Time, in the “Right” Place, in the “Right” Way, to the “Right” Person. In Proceedings of the International Working Conference on Advanced Visual Interfaces (pp. 287–294). New York, NY, USA: ACM. https://doi.org/10.1145/2254556.2254611

Ghuloum, H. (2012). The utilisation of new ICT services in academic libraries in the state of Kuwait: An interpretive case study (phd). Salford : University of Salford. Retrieved from http://usir.salford.ac.uk/26690/

Haneefa, Mohamed. (2007). Application of information and communication technologies in special libraries in Kerala (India). Library Review, 56(7), 603–620. https://doi.org/10.1108/00242530710775999

Hensley, C. B. (1963). Selective Dissemination of Information (SDI): State of the Art. In Spring Joint Computer Conference (pp. 257–262). Retrieved from https://www.computer.org/csdl/proceedings/afips/1963/5062/00/50620257.pdf

Husain, S., & Nazim, M. (2015). Use of different information and communication technologies in Indian academic libraries. Library Review, 64(1/2), 135–153. https://doi.org/10.1108/LR-06-2014-0070

Igwe, K. N. (2010). Resource Sharing in the ICT Era: The Case of Nigerian University Libraries. Journal of Interlibrary Loan, Document Delivery & Electronic Reserve, 20(3), 173–187. https://doi.org/10.1080/1072303X.2010.491016

Kumar, V., & Svensson, J. (Eds.). (2015). Promoting social change and democracy through information technology. IGI Global.

Law, R., Leung, R., & Buhalis, D. (2009). Information Technology Applications in Hospitality and Tourism: A Review of Publications from 2005 to 2007. Journal of Travel & Tourism Marketing, 26(5–6), 599–623.

López, S. P., Peón, J. M. M., & Ordás, C. J. V. (2009). Information Technology as an Enabler of Knowledge Management: An Empirical Analysis. In W. R. King (Ed.), Knowledge Management and Organizational Learning (Vol. 4, pp. 111–129). Boston, MA: Springer US. https://doi.org/10.1007/978-1-4419-0011-1_8

Malhan, I. V. (2006). Strategic Planning for Developing Indian University Libraries into Knowledge Resource and Service Centers (pp. 1–12). Presented at the World Library and Information Congress: 72nd IFLA General Conference and Council, IFLA. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.150.7515&rep=rep1&type=pdf

Okumus, F. (2013). Facilitating knowledge management through information technology in hospitality organizations. Journal of Hospitality and Tourism Technology, 4(1), 64–80. https://doi.org/10.1108/17579881311302356

Peyala, Venkataramana. (2011). Impact of using information technology in central university libraries in India: Results of a survey. Program, 45(3), 308–322. https://doi.org/10.1108/00330331111151610

Ranganathan, S. R. (1931). The Five Laws of Library Science. Madras Library Association (Madras, India) and Edward Goldston (London, UK). Retrieved from http://arizona.openrepository.com/arizona/handle/10150/105454

Rouse, M. (2006, June). What is fax? Retrieved September 8, 2017, from http://searchnetworking.techtarget.com/definition/fax

Sampath Kumar, B.T., & Biradar, B.S. (2010). Use of ICT in college libraries in Karnataka, India: a survey. Program, 44(3), 271–282. https://doi.org/10.1108/00330331011064267

Sastry, H. G., & Reddy, L. C. (2010). Digital Repository Software Packages: An extended architecture for image handling in open source packages. International Journal of Information, 2(2), 115.

Thomas, C., & McDonald, R. H. (2005). Millennial net value (s): Disconnects between libraries and the information age mindset. Florida State University, Retrieved from https://www.researchgate.net/profile/Robert_Mcdonald4/publication/22845252

8_Millennial_net_value_s_Disconnects_between_libraries_and_the_information_age_mindset/links/00b7d5230d35bc0d7f000000.pdf

Walsh, A. (2009). Quick response codes and libraries. Library Hi Tech News, 26(5/6), 7–9. https://doi.org/10.1108/07419050910985255

Woodward, J. (2009). Creating the Customer-Driven Academic Library. Chicago: Amer Library Assn Editions.

Xu, F. (2014). QR Codes and library bibliographic records. VINE, 44(3), 345–356. https://doi.org/10.1108/VINE-12-2013-0070