CHAPTER-2

REVIEW OF LITERATURE

2.1 Introduction

Review of Literature is an important part of the research. It gives an idea about the related studies conducted on Current Trends in Information Communication Technology Application in the Libraries in India as well as abroad. It allows to avoid the duplication of research work and develops the understanding of the research complications. For review, articles on Information Communication Technology Application in the Libraries have been taken from print as well as e-resources such as Emerald, Elsevier, JSTOR, Open Access e-journal, Directory of Open Access Journal, Directory of Open Access Repository, Institutional repositories, Google Scholar, etc. The reviews of this study are chronologically arranged in each section.

1. General Studies on ICT
2. Studies on ICT infrastructure
3. Studies on E-resources
4. Studies on Library Automation and Lib. Software
5. Studies on Social Networking Sites
6. Studies on RFID and Internet
7. Studies on web OPAC and Open Access Resources
8. Studies on Current Trends, Mobile Devices and Cloud Computing
2.2 General Studies on ICT

Patience Emefa Dzandza (2017) studied on “ICT services to students in the greater Accra region of Ghana: An initiative of the Ghana Library Board towards the development agenda”. It is revealed that the ICT corner is operated by two qualified staff. The centre has 30 working desktop computers, 29 are available for use of the public and 1 is used by the staff, a projector and screen, 2 routers with 24 ports, each securely stored in a cabinet, a photocopier, scanner, a colour printer and internet connectivity is also available in the library. The study brought to face the contribution Ghana Library Board is making to achieve agenda 2023 and 2030 by helping students to acquire basic ICT skills.

According to Vincent Anayochukwu Ani et al. (2016), there are many challenges faced by postgraduate researchers’ related ICT applications such as lack of access to ICT resources, lack of ICT skills by users, lack of fund, high cost of internet, incompetence of library staff and lack of awareness of ICT-based library resources.

The work of Khan & Jafar Iqbal (2016) revealed that majority of respondents visit library daily, 38.12% respondents are frequently using online journal lab, 86.87% respondents are using online journal lab for research purpose, 93.12% respondents are aware about ICT based services. They also explore that lab facility for online journals are most used service, 74.37% consult e-journals, 50% agreed that the application of ICTs and services have raised the usage level of library’s resources, 64% rated that ICT based library operations and services as very good, 61.25% agreed that OPAC is user friendly, 28.12% preferred simple search method in OPAC and 56.25% opined that they are satisfied with the help provided by the staff.

Konwar (2015) found that college libraries are facing with various problems in and growing day by day with chasing the challenges. UGC’s autonomous centre
INFLIBNET are continuously doing their best effort to support the automation of libraries with software SOUL and other helping hand. They mainly discussed about the basic problems of the college libraries with reference to implementing and digitizing ICT applications.

The study of Kaur (2015) depicted that respondents use a variety of information communication technology products and services for their research work. He also found that there were many obstructions such as lack of training and lack of technical knowledge to use information communication technology by the research scholars of GNDU.

Chisita & Miranda (2015) examined the various projects initiated to promote resource sharing probed and how ICT has altered academic libraries in the form of digital technology. They also explored the extent to which academic libraries are creating the use of technology to donate the research program.

Saxena & Dubey (2014) explored many problems faced by the academic libraries in implementation of digital technology. Study also reveals that number of digital resources were originated in the academic libraries of different states of India like Tamil Nadu, Karnataka, Rajasthan, Kerala and Uttar Pradesh. According to them there is need to increase the collection.

Seena & Sudhier Pllai (2014) did a study on ICT skills and observed that Libsys software was mostly used by the libraries and many professionals indicated that the inadequate training in information communication technology applications is the main constraint in the libraries. All the professionals express positive attitude towards the application of information communication technology in libraries.

According to Nebeolise (2013), there are many reasons that are hindering the effective use of ICT in library, these are like access and easy retrieval of information,
quick delivery of information services, inadequate provision of ICT training programs, inadequate ICT skilled professional librarians, inadequate power supply and inadequate ICT infrastructures etc.

Khademizadeh (2012) observed that users become aware of modern information technologies used by the most important source internet or intranet in their library and majority of the respondents say that electronic sources make it easier to gather and use information. He found significant relationship between e-environment and collection development. Findings also revealed that librarians feel information communication technology applications affect the collection development of library System.

The work of Olanrewaju et al. (2011) revealed many problems were identified like inadequate funding, insufficient facilities etc. They also found many problems like constant power failure, hindering the maximization of its anticipated benefits.

The study of Sivakumaren, Geetha & Jeyaprakash (2011) explore that libraries have 11 to 20 computers. Libraries also provides printers, scanners, and photocopiers. 50% government university libraries had more than 31 computers and 50% deemed university libraries had 11 to 20 computers. All libraries from government universities and 5 of those from deemed university libraries had scanners. 90% libraries have implemented library automation and digital library software. Technologies such as barcode, smart card, RFID, videoconferencing, and internet technology were identified.

Kumar & Biradar (2010) did survey on “Use of ICT in college libraries in Karnataka, India: A Survey” and found that lack of budget, lack of manpower, lack of skilled staff and lack of training are the main constraints for not
automating library activities. Library professionals expressed a positive attitude towards the use of ICT applications and library automation.

Antherjanam & Sheeja (2008) studied on “Impact of ICT on Library and Information Science: Major Shifts and Practices in CUSAT Central Library”, they found that about 90% of the users search OPAC for getting information. 65% use internet searching facility and online journals etc. Issue & return of books, book selection, price checking are used very efficiently with the help of ICT.

Chisenga (2006) studied on “Information and Communication Technologies: Opportunities and Challenges for National and University Libraries in Eastern, Central and Southern Africa”. He perceived from the study that in university libraries, there is lack of funds to sustain ICT infrastructure, there is inadequate ICT facilities. Applications of ICT are very limited, most libraries are depending on donor support for ICT infrastructure.

Lan Anh Tran & Gorman (1999) did work on the “Implementation of Information Technology in Vietnamese Libraries” and they discussed the library and information sector’s growth in the implementation of IT. They found that many libraries of Vietnamese have basic Information Technology hardware and software.

2.3 Studies on ICT infrastructure

Saxena (2017) did study on “Enhancing ICT infrastructure in public services: Factors influencing mobile government adoption in India”. It is carried out usefulness, ease of use, trust and attitude have significant influence on the adoption of mobile government services. It is also found that the demographic variables like age, marital status, occupation, educational qualification and frequency of using m-government services were not found to be significant predictors for the adoption of m-government services in India.
The study of Kumar (2015) carried out on “Information and Communication Technology Facilities and Services among Engineering College Libraries in Rayalaseema Region of Andhra Pradesh”. He addressed current status of institutions providing library services such as traditional, electronic, document delivery services like hardware, software and communication resources. He showed that 87.65% library provide windows XP and 72.84% Pentium IV workstation. DELNET seems to be the most preferred information network service and VSAT is found to be mostly used communication service. About 60% libraries are partially automated and barcode technique is most frequently opted for circulation. He concluded that automation is still an ongoing process in libraries of Rayalaseem Region.

According to Konwar & Sinha (2014), most of the college libraries are not providing appropriate infrastructure related to ICT application. Only Gurucharan College library and Silchar College library have a computer laboratory for browsing internet and access of e–resources. Most of the colleges are providing the facility of UPS, Generators, and Inverters but the functionality of power back up are not sufficient to accomplish the requirement. They also revealed that library housekeeping operations were not fully operated. Internet connectivity of few colleges are providing for librarians not for students.

Bandyopadhyay & Mondal (2014) did survey on “Availability of ICT infrastructure in the University Libraries of West Bengal, India” and found that maximum libraries are providing basic infrastructure. They also found that university libraries are giving less importance to the implementation of information communication technology. The open access library facility is provided by University of North Bengal and closed/mixed access facility is provided by other university libraries. Calcutta University, JadHAVpur University, University of North Bengal and Vidyasagar University have good numbers of computers. It is also found that WAN
and Internet facility are provided by all the libraries and all libraries are linked with national or international library network.

Mirza & Mahmo (2014) carried out study on “IT Infrastructure in Pakistani University Libraries”. They explore that most of the university libraries have computers and peripheral devices. It is found that few library use standard integrated library management software. Majority of university libraries use Internet Explorer and fixed line telephone facility. Fax is used in some of the university libraries. Many of the libraries use local area network (LAN) while some of them use wireless network.

Fidelis et al. (2014) studied on “An Evaluation of ICT Infrastructure and Application in Nigeria Universities” and exposed that most Nigerian universities use computers, internet and telephone. They found that importance is given to computers and internet. It was found that internet facilities are utilized oftentimes. ICT infrastructure is not being sufficiently provided.

Amara Malik & Khalid Mahmood (2013) surveyed on “Infrastructure needed for digital reference service (DRS) in university libraries: An exploratory survey in the Punjab, Pakistan”. They distributed the questionnaire via post and e-mail and received back from 38 universities. They found that information communication technology infrastructure desired in libraries is better than before. And they further added that some improvement is necessary. Most of libraries have collection of general and reference in e-form and some of libraries are using Digital reference Service.

Dhanavandan, Esmail & Nagarajan (2011) analyzed the “ICT infrastructure facilities with reference to self-financing engineering college libraries in Tamil Nadu”. The study traced out that the library application software are being used in
most of the engineering colleges in Tamil Nadu. They suggest that the establishment of ICT infrastructure facilities can improve information support, information retrieval and excellence of education.

**Dhanavandan & Nagarajan (2011)** did survey on “Information Communication Technology (ICT) Infrastructure Facilities in Self-Financing Engineering College Libraries in Tamil Nadu”. The findings reveal that 87.14% of the libraries are providing client and work station facility. Majority of the libraries have CD Tower facility but don’t have CD ROM servers. Windows is the mostly used operating system followed by Linux, Novel NT and Sun solar. In most of the self-financing engineering college libraries, Autolib is widely used library management software followed by Libsoft and in-house prepared software. Half of libraries are using digital library software. Most of the libraries are using Photoshop followed by Adobe and Ventura software. CD writer facility is available in majority of the libraries and have 2-5 CD writers in libraries. Majority of the libraries have LCD projector. Most of the library use BSNL connection. Internet is being used by more than half of the libraries for bibliography, SDI and CAS services. Some libraries subscribe e-journals. Online database (Inspec, Compendex and Chemical Engineering) and CD ROM are available in very few libraries.

**Walmiki & Ramkrishnagowde (2009)** surveyed on “ICT Infrastructure in six selected University Libraries of Karnataka” and got results that the most of the libraries are lacking with the sufficient hardware and software facility, these libraries don’t have adequate internet and bandwidth. Study also reveals that the libraries are vary one to another in ICT Infrastructure and LANs are not fully used.

**VKJ Jeevan & Padhi (2008)** studied on “Infrastructure, Resources and Services in IIT Libraries: Results of a Questionnaire Survey”. They found that IITs,
IIMs, and Central Universities are well organised and providing better services and fully efficient infrastructure.

**2.4 Studies on E-resources**

**Narender Kumar & Lalita (2017)** did survey on “Usage of electronic resources at University of Delhi: A case study”. They found that in case of foreign databases, the cost per use has increased in the past 10 years and the cumulative average cost per use has been less. In case of subject, the cheapest cost per use has been from the databases providing statistical data and the costliest cost per use has been from discipline social science followed by management, general databases, science, humanities, technology and computer science. It has also been found that the Britannica Online has been the most economical database costing and World Intellectual Property Search as most expensive costing. University of Delhi has saved substantial amount by subscribing these databases instead of purchasing these article from open market.

**Munusamy Natarajan (2017)** did survey on “Use and Impact of Electronic Resources by Information Science Students at Jimma University, Jimma, Ethiopia”. It is explored that the usage of e-journals is increasing due to awareness of e-resources and services among the students, e-journals have been increased in numbers and these are accessed from the hostels and departments in comparison to the library.

**Akpojotor (2016)** surveyed on “Awareness and Usage of Electronic Information Resources among Postgraduate Students of Library and Information Science in Southern Nigeria”. It is depicted that electronic information resources are highly used by postgraduate students so they are quite aware of these.

**Akporhonor & Akpojotor (2016)** studied on “Challenges Confronting Postgraduate Library and Information Science Student in the Use of Electronic Resources in Southern Nigeria”. They found that postgraduate students are facing
many problems like poor internet connectivity, high cost of access, information overload, irregular power supply, download delay and difficulty in accessing some websites.

Egberongbe (2016) did survey on “Digital Resources Utilization by Social Science Researchers in Nigerian Universities” and analysed that the main sources of electronic information in the social sciences are not available in university libraries and faculties are also unaware of this. Effective utilisation of available resources was also not there because of lack of information technology (IT) knowledge.

Ekere, Omekwu & Nwoha (2016) studied on “Users’ Perception of the Facilities, Resources and Services of the MTN Digital Library at the University of Nigeria, Nsukka”. They found that the users were satisfied with the collection of e-resources (video CDs, CD-ROMs, online databases and portals) of the library. They are also satisfied with online indexes and abstracts services. Services like online internet, search, e-mail services and online reference services were used at wide range.

Claire Leduc & Joachim Schopfel (2015) observed subscribed journals are requested and accessed by most of business schools. 54,751 full-text article requests have been performed in 2010. 245 different journals have been accessed by the business schools. The average of per student article request is 1.24. Topics like European Journal of Marketing, Journal of Consumer Marketing, Management Decision, the Journal of Product & Brand Management and the International Journal of Retail & Distribution Management were most requested.

According to the work of Sujatha (2015), the academic community is aware of e-resources and internet. Electronic information sources are used by majority of the academic community and printed generals are offered among the respondents.
followed by EIS. Students are facing difficulties in retrieval of irrelevant information, poor connectivity, poor database searching skills etc.

**Krishna & Singh (2015)** studied on “Library e-resource services and its impacts on research scholars of university of Allahabad”. They used statistical method, present study implicates that the values of chi square on different attributes are very high and significant rejecting null hypotheses. The significant of relationship on different attributes are effective among research scholars and coefficient correlation value for study of time spent is -1 which means the variables have a negative correlation and positive correlation for OPAC study.

**Ukwattage & Ramanan (2015)** conducted study on “Importance and Usage of Electronic Information Resources at the Library of Kotelawala Defence University” and found that HINARI and Britannica Online databases are accessed by the university library and these are accessed by the majority of the users from their residence and workplaces. Undergraduates use library during assigned period. They prefer searching information through printed materials to electronic resources. They also revealed that the space of library is not sufficient for providing better services.

**Muhammad Tariq, Mahmood & Hameed-ur-Rehman (2015)** surveyed on “Use, Purpose and Usage Ranking of Online Information Resources by University Research Students of Public and Private Sector Universities of Lahore, Pakistan” and investigated that research students are using social networking sites frequently while PhD students are using journal and magazines for their informational needs. They also explored that research informational needs are widely preferred function to use online information resources by research scholars.

**Ukachi (2015)** studied on “Information Literacy of Students as a correlate of their use of Electronic Resources in University Libraries in Nigeria” and explore that
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electronic resources are not being adequately utilized; UG students don’t have adequate information literacy skills for prime utilization of electronic resources.

Singh & Kataria (2015) conducted a study on “Awareness and Use of E-Journals among the Research Scholars & Faculty Members of Banasthali University, Rajasthan: A Comparative Case Study” and found that majority of research scholars and faculty members aware about e-journals from library professionals and other faculty of the university respectively. They also investigated that both feel convenient to employ with print and electronic journals for research and development, some respondents are saying that they are using journals for updating their subject knowledge. 4 hours or more than 4 hours, internet is accessed by the most of the scholars and faculty members. Most of research scholars and faculty members access e-journals from central library or computer lab. Research scholars and faculty members are facing problem because library is providing very less numbers of e-journals of their subjects and they are lacking to orientation and training about accessing of e-journals and there is low internet speed.

According to Sinha & Deb (2015), conceived the status of “Usage of E-Resources available under INDEST-AICTE consortium by library users of NIT, Silchar, Assam”. They found that majority of the users are aware about the INDEST-Consortium and they utilized e-journals, frequently. They also revealed that printed and electronic resources are used equally by the majority of the respondents for the study and research. It is suggested by the most of the respondents that there should sufficient numbers of internet terminal. Authority should provide adequate internet terminals with high speed of bandwidth for the use of e-resources.

Jamal Qasim & Khan (2015) studied on “Use of e-journals by the scientists of CSIR-Institute of Genomics and Integrative Biology (IGIB), Delhi, India”. They
explored that scientists are being attracted towards e-journals provided by CSIR-NISCAIR Consortia. E-journals are consulted by majority of the scientists to their campus cabins to update their own knowledge study and research purposes. The infrastructure of the institute is good for using resources to use e-journals and scientists are not facing any type of technical problem related to hardware and software. Institute library is also providing high bandwidth of internet. Largest computing facility is also used by the CSIR-IGIB library.

2.5 Studies on Library Automation and Lib. Management Software

Bhat & Ganaie (2017) did survey on “Status of collection in agricultural libraries of Northern India with an overview of the trend in acquisition”. They reveal that most of the libraries are providing sound collection of print information resources. Agricultural libraries are not absolutely providing E-Books in their collection and at present additional e-journals are not being subscribed.

Akintomide (2016) did study on “A Study of Nigerian Librarians' Attitude to Open Source Software” and found that librarians are aware about open source software and proprietary software. Librarians are in the favour of open source software. It is also revealed that the android operating System is most popular operating system for mobile while windows operating system is the most popular operating system for desktop computers.

Bassey (2016) studied on “Adoption of Software Packages in University Libraries in Nigeria” and found that most widely adopted and used software package is KOHA. In Nigerian university libraries, the level of automation is very low.

found that the majority of libraries are using local software or customize software for management of libraries. Most installed and used software is Libsys among libraries.

**Shah & Sonker (2014)** conducted study on “Libsys Library Management Software used in Special Libraries of Lucknow: A User Survey” and investigated that in special libraries of Lucknow, Libsys is an economic software which satisfy all the modules and it is very satisfactory software. Some of the users are not satisfied to the installation of Libsys.

**Satish Kumar & Singh (2014)** surveyed on “Application and Use of Library Software: A Survey of Selected Central University Libraries of North India” and it is found that all the selected libraries are using automation software but Jamia Millia Islamia is suing efficiently followed by Delhi University, three universities out of five are using Libsys.

**Satish Kumar & Singh (2014)** did survey on “Application and Use of Library Software in Central University Libraries: A Comparative Study” and most of the problems were faced during automation by Aligarh Muslim University library. It is observed that both libraries were having good IT infrastructure and other accessories. Staff strength of BHU library is better than AMU library system.

**Lakpathi (2014)** carried out survey on “Status of Library Automation in India” and found that most of users are using E-Granthalaya software which is free, highest number of LMS users are in Maharashtra (615), Tamilnadu (373), Karnataka (354), Delhi (279), Uttar Pradesh (167) and Telangana State (153). He also exhibits that the cataloguing and circulation modules and other functional modules are available in listed Library Management Systems, Online Public Access Catalogue (OPAC) is available only in 13 Library Management Software and city-wise automated libraries
in India, major cities are taking top five positions starting with Delhi, Bangalore, Mumbai, Chennai and Hyderabad city.

**Krubu & Osawaru (2011)** found that Harris University Library and Benson Idohaosa University Library are using Strategic Library Automation Management software. It is also carried out that in both the libraries, only three sections that are Readers Service Division, Collection Development Division and Technical Service Division are automated.

### 2.6 Studies on Social Networking Sites

**Mike Thelwall & Farida Vis (2017)** conducted study on “Gender and image sharing on Facebook, Twitter, Instagram, Snapchat and WhatsApp in the UK: Hobbying alone or filtering for friends?” It is found that females share photos more than males and share images more frequently on Snapchat, but males share more images on Twitter for hobbies. Females tended to have more privacy related concerns and share pictures of their children. Females also interacted more through others’ images by liking and commenting. Both genders use supporting apps but in different ways. Males were more likely to be alone in their profile pictures.

**Khan & Jia Tina Du (2017)** did online survey on “Professional development through social media applications: a study of female librarians in Pakistan”. It is revealed that the majority of Pakistani female librarians are aware about the social networking sites and these are used frequently. They also found that social media is judged to be less helpful in obtaining technical skills. The study found a number of factors affecting the use of social media for professional development such as privacy, parent’s years of schooling, marital status and family support.

**Eze (2016)** studied on “Awareness and use of Web 2.0 tools by LIS Students at University of Nigeria, Nsukka, Enugu State, Nigeria”. It is explored that students are
moderately aware from some web 2.0 tools like instant messaging, blogs, Social networking sites and Wikis. They are not aware with tools like RSS feeds, podcasts, and social bookmarks. Facebook is the most regularly used web 2.0 tool followed by YouTube and wikis. To communicate with friends or family, exchanging opinions or news for their professional as well as personal life are the reasons for using social networking sites. It is also revealed that students learn to utilize these tools through friends followed by self-practice and from the help of library.

**Fasae & Iwari (2016)** conducted study on “Use of social media by science students in public universities in Southwest Nigeria”. They reveal that 93.5 percent respondents are using Facebook, 63.8 percent are using Google+ and 47.8 percent are using Twitter. 70.3 percent of them are using social media daily while 18.1 percent are using occasionally to update about trending events/news followed by communicate with friends or family. The results highlighted that social media distracts the respondents by unnecessary messages and pictures.

**Naqvi (2015)** conceived the study on “Use of Social Networking Sites: A study of the College of Medicine, Nursing and Health Sciences (CMNHS) students at Fiji National University”. They explore that most respondents were aware about social networking sites. They use the social networking sites to communicate with family and friends on weekly, daily and monthly basis. Facebook, YouTube and Wikipedia were very popular and used by the majority of students to their laptops and PCs. Majority of students never changed their profile privacy setting and they made their profile visible to well-known people as well. It was also revealed by majority of students those who were uncomfortable with unethical advertisements/photos/information posted to their webpage and their account did not hack and majority of students were satisfied with Facebook, YouTube and Wikipedia.
Bowman (2015) studied on “Differences in personal and professional tweets of scholars” and found that there were significant differences between professors that reported having a twitter account, significant differences found between types of twitter accounts (personal, professional, or both) and significant differences in the affordances used in personal and professional tweets. He also reveals that framing behaviours assist altmetric researchers in distinguishing between personal and professional tweets.

Mingle & Adams (2015) studied on “Social Media Network Participation and Academic Performance in Senior High Schools in Ghana”. Whatsapp and Facebook are used for making friends and chatting by most of the students. Due to the excessive use of social media, students feel that they are poor in grammar and spelling and they don’t submit assignment on time, they have less time to study and they are in poor academic performance. They also found that students have improved their reading skills because of sharing ideas on social media.

Singh & Gill (2015) did survey on “Role and users’ approach to social networking sites (SNSs): a study of universities of North India”. All the users are knowing social media tools in their academic affairs. Most common social networking site is Facebook among all the respondents. Most of the respondents are aware to the security purpose of social networking sites.

Ali Al-Aufi & Fulton (2015) conducted study on “Impact of social networking tools on scholarly communication: across-institutional study”, they explore that 33% of the respondents did not use social networking tools for casual scholarly communication.

Sultan Al-Daihani & Suha AlAwadhi (2015) conducted study on “Exploring academic libraries use of Twitter: A content analysis”. They reveal that academic
libraries are using twitter as a multifaceted tool. News and announcements type of information is most often posted tweet by libraries followed by library collections and services, library marketing and news, referrals and books.

Mansour (2015) studied on the “Use of Social Networking Sites (SNSs) by the faculty members of the School of Library & Information Science, PAAET, and Kuwait”. Most of the faculty members were accessing social networking sites many times in a week from their office, residence and computer lab. Social networking sites are being used from last six years. YouTube, Twitter, Facebook and blogs are the interested social networking sites among the respondents. While famous social networking sites are Facebook, Twitter and YouTube for communicating with friends, family for sharing information.

Yalan Yan, Xianjin Zha & Ming Yan (2014) studied on “Exploring employee perceptions of web 2.0 virtual communities from the perspective of knowledge sharing”, they found that employees are more likely to seek knowledge from web 2.0 tools. There are positive correlations between contributing knowledge and seeking knowledge. Practical implications in Chinese organizations are encountered less frequently, compared with western countries. Study provides useful insights into the informal sharing in web 2.0 tools, which is helpful for guiding knowledge management practice in China.

Omekwu, Eke & Odoh (2014) did survey on the “Use of Social Networking Sites among the Undergraduate Students of University of Nigeria, Nsukka”. Social networking sites are used by most of the respondent to interact with friends, to connect with their classmates for doing online study. Students are also using social networking sites for chatting serious national issues and watching movies etc.
Boateng & Liu (2013) studied on “Web 2.0 Applications’ Usage and Trends in top US Academic Libraries”. They investigated, each and every academic libraries is using social networking sites that is Facebook and Twitter. In web 2.0 tool, social networking sites are used mostly and least used is Wiki. Blog was the second most popular tool, followed by RSS and IM/Chat with 97% and 91% respectively. The Participation in vodcast and podcast is 47% and 46% respectively by the respondents while 39% of academic libraries are using social bookmarking or tagging.

Bierman & Valentino (2011) studied on “Podcasting Initiatives in American Research Libraries” and found that around 33% of American research libraries have podcasting initiatives. With the help of social media, podcasts are promoted.

2.7 Studies on Internet and RFID

Vivekavardhan, Rao & Vishwa Mohan (2015) studied on “Perception of Engineering College Faculty and Students on Web Search Engines for Information Retrieval” and found that the respondents perceive Google as the most users friendly. Majority of the respondents use general search option and search engine ranking Google as number one search engine. The study also reveals that the majority (71.60%) of the students need training on web search engines to optimize the usage of the web search engines.

Sumi & Kumar (2007) studied on “Application of RFID Technology in Libraries” described that impression about the RFID. They also explained about uncertain budget to install RFID technology in the library. They concluded that manpower and money reduced and results get improved by the use of technology, this lead to safety as well as access control. The only barrier is uneconomical.

Materials” described that brief idea about the features of RFID in Libraries, Disadvantages of RFID Systems, installations and recent developments. They found that security and material tracking are the needs of the library which is addressed by comprehensive system that is RFID.

**Vasishta (n. d.)** highlighted in article about the importance and working of Radio Frequency Identification (RFID) technology. It is also described about the basic components essential for smooth working of RFID system.

**Narayanan, Singh & Somasekharan (n. d.)** discussed the process of implementation, advantages and disadvantages of RFID system in Library. They found that RFID technology is popular and increasing among libraries and it is economic in sense.

**Pandey & Mahajan (n. d.)** discussed that the importance of library security, applications of Radio Frequency Identification technology in libraries, its components, benefits and role of librarian. They concluded that RFID technology is more effective, convenient and cost efficient for library security.

### 2.8 Studies on Web OPAC and Open Access Resources

**Gabriel Bosah et al. (2017)** did study on “Perceptions, preferences of scholarly publishing in open access journals: A survey of academic librarians in Africa”. They found that academic librarians are aware of the “green” and “gold” routes but not familiar with the “diamond” route. It is also revealed that most of the academic librarians publish only one paper in open access journals, reputation of journal and impact factor of journal were seen as very important. The majority of the respondents agreed that author fees, lack of stable internet connectivity are the major barriers to publish in open access journals.
Mohammadamin Erfanmanesh (2017) did study on the topic “Status and quality of open access journals in Scopus”. It is explored that open access journals are 17% out of the total journals of scopus in 2015. It is also revealed that an uneven spread of open access journals across disciplines, ranged from 5.5 to 28.7%. Non-open access journals get much higher mean worth than open access journals.

Jafar Iqbal & Naushad Ali (2017) studied on “Familiarity and utilization of open access resources: A study of library users of Cochin University of Science and Technology and Pondicherry University” and explore that most of the respondents of Cochin University of Science and Technology and Pondicherry University believe that they are aware of open access and they are using open access repository of their library. Among open access resources, electronic theses and dissertations are the most preferred resources. 56% respondents from Cochin University and 52.50% from Pondicherry University say that cited “screen reading” as a main barrier in accessing open access resources.

Roy, Biswas & Mukhopadhyay (2016) studied on “Status of Open Access Institutional Digital Repositories in Agricultural Sciences” and revealed that there are 29 Asian countries in Open DOAR and 26 Asian countries in Open ROAR records. It is open for listed operators only. There is a repository that provides link to DOAJ and DOAB is other repository which gives permission of free access to the e-books. Repositories are also available in different language such as Hindi, English, Arabic Thai, Chinese, Japanese and Persian etc.

Chintha (2013) carried out work on “Study of Web-Based OPAC Services in India”, he revealed that 47.3% libraries use open source software, 37.5% use commercial library management software, 14.5% use free library management software and 0.7% libraries use in-house library management software. He also found
that highest number (27.6%) of libraries in Tamil Nadu have implemented Web-based OPACs followed by 17.8% in Karnataka and Utarakhand. Most of the libraries don’t have library web page.

Thanuskodi (2012) conducted survey on “Use of Online Public Access Catalogue at Annamalai University Library” and explores that 33% users are using OPAC regularly to know the availability and place of the essential documents. Half of the users are satisfied to use the OPAC while one-third are moderately satisfied and only one fifth of the users are fully satisfied. 58.33% are searching documents to use card catalogue while rest of them search from the library shelves.

2.9 Studies on Current Trends, Mobile Devices and Cloud Computing

Cibangu, Mark Hepworth & Donna Champion (2017) studied on “Mobile phones for development: An information case study of mobile phone kiosk vendors in the Congo”. They found that mobile phones should be geared towards the liberation, not utilization or commodification of humans and their needs. They also explore that mobile phones are not a catalyst of human basic capabilities.

Fasae & Iwari (2015) studied on “Mobile devices for academic practices by students of college of sciences in selected Nigerian Private Universities”. They revealed that mostly (83.7%) use smart phones than other mobile devices for the purpose of using educational applications and 72.50% use to chat with people. Students use the internet on their devices very often and mostly used for e-mails (71.25%), social media (68.75%) and search engines (60.50%). 81.25% students are facing challenge due to poor internet connectivity and 53.75% students face due to high cost of data subscription.
Partap Bhanu (2015) studied on the topic “Current trends in library and information Science research in India 2008–2013: A study” and examined that this study helps in making them (Library and Information Science research students) aware about the current development of information and communication technology applications.

Fintan Bracken et al. (2014) conducted study on “The potential use of online tools for scientific collaboration by biology researchers”. It is found that biology researchers are using online tools at the large extent while they are not using social networking sites. Researchers are sharing and talking with their associates via e-mail and phone calls. They also found that researchers do not use web 2.0 tools.

Susan Hurst (2013) studied on “Current trends in UK university libraries” found that total institutional spending on libraries from 3% in 2000-2001 fallen to 2.5%. To continue its serving in university income, the library is seeking to take help by many features of business philosophy and performance measurement. There is a crucial necessity to attain user hopes by giving immediate access to answers.

Mayank Yuvaraj (2013) studied on “Cloud Computing Applications in Indian Central University Libraries: A study of librarians use” and librarians in Indian central universities are very busy in various activities related to cloud computing and they are taking interest to adopt cloud computing in the libraries. Male professionals are more interested to use cloud computing than female. They also found that tools provided by OCLC, ExLibris, Duraspace & KB+ are used by librarians. Cloud computing technology is cheaper than the traditional computing methods.

Krishnamurthy & Rajashekara (2011) studied on “Current Trends in Wireless Technologies in Academic Libraries”. They found that Wi-Fi technology at ISI, Bengaluru libraries is comparatively decent. Information is accessed from the
departments, hostels and computer centres and also from the libraries. Due to Wi-Fi technology, databases and information products, hardware and software, input formats, processing, data exchange, output formats have highlighted the importance of achieving it capability.

2.10 Conclusion

The aforesaid review of the literature has been done with the help of research articles, review articles, conference proceeding articles and reports etc. It concludes that various research work have been carried out on the Information Communication Technology Applications in the libraries. This review of literature covered many related studies between 1999 and 2017.
REFERENCES


Chapter 2

**Review of Literature**


