

Current Status of Emerging Trends in The Universities Libraries of Pakistan

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Abstract

This study is descriptive in nature, survey-based approach is adopted to achieve the objectives of the study. This thesis explains the current situation of emerging trends in the form services and resources in private sector university libraries of Khyber Pakhtunkhwa. The adapted questionnaire was used for acquiring data from the in-charge librarians of Eleven Private Sector Universities Khyber Pakhtunkhwa /Degree Awarding Institute recognized by Higher Education Commission, Pakistan (HEC). Findings of the research work show that the only three libraries were well equipped and using modern trends beside the conventional setup. While in further discussion, it reveals that lack of financial resources is the major barrier to implement emerging technology in university libraries. Some of the libraries have lack of professional and skillful staff which is another hurdle to introduce modern technological based services and emerging resources in university libraries. The distribution of separate financial plan for emerging technologies and trends, hiring of qualified and technological skilled staff , arrangement of training and user education programs, provision of the power supply Uninterrupted Power Supply (UPS) generators, high-speed internet connections, implementation of updated hardware and software as per HEC requirements to fulfill library need and measurements, should be given top priority for enhancement and provision of better library service and resources to the clientele.

Keywords: Emerging Technologies-Libraries, Modern Libraries-Pakistan, Current status-emerging trends-university libraries

Introduction

Information is basic need of human being just like air, water, food and shelter (Kemp D. A.,1976). According to Shannon and Weaver Peter Herson information is ideas, concept, facts and figure, or raw data or imaginative approach of any human mind which is capable to transmit in any format whether formally or informally. In libraries, information is the main stimulus to reduce the stress and uncertainty in the mind of patron, or information seekers (AVijayakumar, 2011). Information in old ages was found on clay tablets, leather sheets pages and in printed form which was very difficult to maintain and utilize. With the arrival of advanced computer technology such as audiovisual technologies, telecommunication, cloud computing, cutting edge technologies, had shifted the shape of information from machine readable to online terminals and clouds. (Mairaj M. I 2016).

The present era of advanced computer technology had greatly affected our lives socially, financially, politically and globally. (Ahmed W, 2015). Emerging Technologies are now playing a vital role in present age or advance research. The recent and abrupt advancement in the technologies has brought several changes in the field of library and Information science (K.R Mulla, 2006). Emerging technology has made some firm changes and created new dimension to the information center to provide services and resources in different format to the end users stated (Back, G. & Bailey, A. 2010).The main emerging technologies or web-based technology are Semantic Web, Cloud Computing, Social Media Networking Sites such as RSS (Really Syndicate System) wikki, Podcasting, Tagging, Instant Messaging, Blogs, Mobile Libraries, Mobile Online Public Access Catalogue (OPAC). (Ahmed, W2015). The use of emerging technologies in

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libraries especially in developing countries was a great challenge due to lack of financial resources (Baro et al,2013). The socio-economic condition of Khyber-Pakhtunkhwa was inadequate which had not provided any opportunity for the capacity building of the library community (Khan Arif, 2016). In the same study it was reflected that power failure is the major hurdle to the smooth implementation of emerging library technologies. Adoption of web 2.0 technologies needs a skillful training sessions and cooperative institutions from higher authorities, but librarians faced lack of such activities in Khyber Pakhtunkhwa in particular.

Literature Review

Back, G & Bailey, A (2010) Emerging technology has made some firm changes and created new dimensions to the information center to provide services and resources in different form to the end users. Emerging trends are known to be the latest communication tools used to share information within a community, country or around the globe without restriction of space and time. The recent and abrupt advancement in technologies has brought several changes in the field of library and Information science. (K R Mulla, 2006). The main emerging technologies or web-based technology are Semantic Web, Cloud Computing, Social Media Networking Sites such as RSS (Really Syndicate System) wikki, Podcasting, Tagging, Instant Messaging, Blogs, Mobile Online Public Access Catalogue (OPAC). (Ahmed, W. 2015). A study was taken in the University of Mysore India shows the impact of emerging trends on libraries at university level, that libraries equipped with latest emerging trends are available anywhere anytime can be accessed globally. Resource sharing and transfer of information is done through online file transfer system and a librarian act as facilitator. (Jerry, 2011)

When emerging trends and its tool are effectively implemented in the library services and resources, access to online information resources is made easy one step away from its clientele to meet their needs. This is agreed by (Foster et al., 2008) to get maximum benefit from emerging trends. They must be implied in library services and resources to facilitate its user in research productivity.

Data sharing software for example RSS, wikis, Video sharing, virtual, blogs are actually social sharing software that are new trends in the development of a “user-centered” approach allowing users to construct, transform and bring out subjects and disciplines of all kinds (Stephens, 2006) In Pakistan, automation was initiated in 1980’s and till 1987’s many libraries were computerized the achievement of digitization or automation will be observed when special training and workshops are arranged regarding IT awareness for the staff, to give facility and educate them about it use in library and information center. (Malik, Khalid 1995). To maintain a fully automated library, there is need of new trends and approaches that should be originated for information resources, human resources, information services, user education and continuing education for having mastery knowledge over new emerging technology which is needed for organization and maintenance of information center and libraries that are linked with universities and academic institutions. (Nok, G. 2006).

Qutab and Mehmood (2009) investigated some facts that there are only few universities and educational institutes in Punjab out of thousands who had their website contain a library pages as well which give details about the library collection timing and staff, websites. This figure proved that lack of awareness and interest among library professional’s researchers and education specialist regarding importance of IT related activities. Tiwari, (2002) stated said that digitization had become a different and new concept regarding the available resources in library, expertise and capability of information service provider since back in nineties. Furthermore, he added about

future of automatic library or digital library that it will be helpful in establishing information center or information cabins which can be easily accessed and used by the user having no expertise in computers system. They are developed by technological experts and scientists consisting of human computer interfaces mechanism managed by information service provider for the patron to use it and get advantage. The use of emerging technologies in libraries especially in developing countries was a great challenge due to lack of financial resources. (Khan, Amjid 2020)

Khan Arif, (2016) the socio-economic condition of Khyber Pukhtunkhwa was inadequate which had not provided any opportunity for the capacity building of the library community. In the same study it was reflected that power failure is the major hurdle to the smooth implementation in emerging library technologies. Adoption of web 2.0 technologies needs a skillful training sessions and cooperative institutions from higher authorities but librarians faced the lack of such activities in Khyber Pakhtunkhwa. In an analysis of data, most popular Web 2.0 tools such as Facebook, YouTube, Skype, and Twitter are mostly used by librarian while the rest Web 2.0 tools Really Simple Syndicate (RSS) feeds Bookmarking, flickers Podcasting Video casting, Blogging, Folksonomies, and social tagging are not common in use by university librarians of Khyber Pakhtunkhwa, several studies have been conducted on use of IT or ICT technology in university libraries. 63% library professionals are skilled at intermediate level while 25.8 % are at expert level in the usage of latest internet tool. (Ur Rahman, A., and Khan, Arif. 2016). The available literature shows that globally emerging trends are in practice from late 90's Researches is now being conducted throughout the world to know users need of information and emphasize on electronic means of availability of information. University libraries are main hub of information retrieval for researchers and scholars. It holds information in print form as well as digital format. The modernization of university library has progressive impact on its services and resources for the better usage. Some barriers are also discussed in literature review in adaption of modern trends. Shortage of literature was found in Pakistani libraries special in Khyber Pakhtunkhwa regarding digitization and automation. No study was found in the private sector university libraries both at national and local level to know the current situation of emerging trends existing in university libraries.

Objectives of the Study

The main theme of this study is to examine the status of emerging library trends in university libraries.

Research Methodology

The study was quantitative in nature and survey research method was used to achieve the desired objectives. The population of this study were librarians of the Private Sector Universities/Degree Awarding Institute of Khyber Pakhtunkhwa. Each private sector university consists of a central library in their main campus, but some institutions also consist of seminar libraries at the departmental levels and branch campuses. However, some institutions lack such libraries at these levels. So, it was decided to delimit the population of this study only to central libraries of these private sector universities.

As the size of the population is not too large therefore, a census-based approach was adapted, and all the librarians of the central libraries were approached for data collection. So, there is no need of sampling here. The adapted questionnaire was used for data collection. Some modification in the main body of the research questionnaire was made as per the framed objectives of the study. The questionnaire was sent to three experts for ensuring the validity of the instrument. The

amendment suggested by the experts was incorporated accordingly. For reliability of the collection instrument, a pilot study was conducted on a selected population after final modification. Different means were used, such as email and personal visits, phone calls to the central libraries as a follow up tool. The data was presented in the form of tables, simple percentage analysis was used as statistical tool and it was explained in text form. The analyzed and interpreted data was then used to draw some conclusion

Analysis of data and Interpretation

According to Higher Education Commission (HEC) website, there are eleven PSUs/ DAIs in Khyber-Pakhtunkhwa till date. The questionnaire was sent to all those librarians of private sector universities through emails and by hand. The response rate was 100%.

From the analysis of data, is reported that 09(81%) PSUs/DAIs respondent libraries are administered by male while only 02(18%) were operationalized by female. In the same table, respondents were asked to respond about their professional qualification. The responses show that not a single librarian possesses a PhD degree in Library and Information Science in private sector university libraries of Khyber Pakhtunkhwa. There is only one librarian who holds MPhil degree and 08(73%) possessing Masters' degree in Library and Information Science (MLISc) while 18% holds Bachelor in Library and Information Science (BLISc). Respondents were asked about whether they have ICT training and certification, it was reported that only 01(0.09%) librarian had ICT training whereas the rest have no such qualification.

Table No.1 *Hardware facilities in libraries*

S.no	Description	Yes	No
1.	Computer Terminals	11	00
2.	Printers/Scanners	11	00
3.	Barcode Readers	03	08
4.	LCD Projectors/CD Writer	03	08
5.	Microfilm Reader	00	11
6.	Digital Camera	03	08
7.	UPS/Generator	06	05
8.	RFID Security System	00	11
9.	Fire/Emergency Alarm	07	04
10.	Smoke Detector	00	11
11.	Teleconferencing	02	09

The analysis of Table no.1 shows that majority of libraries had computer terminals and printing/scanner facilities. In the enlisted services microfilm reader, smoke detector and RFID Security system were not found even in a single respondent library. In PSUs/DAIs of KP about 27% were found having facilities of Barcode Readers, Liquid Crystal Display (LCD) Projectors/CD Writer, Digital Camera that is 03(27%), whereas 02(18%) were found having teleconferencing facilities.

Table No.2: Internet Services

The analysis of data in Table No.2 reflects that majority of the university libraries have internet

Bandwidth	KBPs	MBPs	GBPs
	00	08	03
Library Website	Yes	No	Total
	03	08	11
Website	Library Rule	Useful Links	University/Staff
	03	03	03

speed in MBPs. While 03 out of 11 private sector universities have website for their libraries. Eight libraries are linked with the main university website.

Table No.3: Accessibility to Useful Links

Access to Useful Links	Yes	No	Respondent Ration
OPAC	05	06	05(45%)
HEC Digital Library	09	02	09(81%)
Open Source Library	02	09	02(18%)
Digital Library of Common Core	02	09	02(18%)

A question was added about the access to useful links through university library website. In table no.3 revealed that 05(45%) respondents have access to Online Public Access Catalogue (OPAC). A good number of respondents 09(81%) have accesses to HEC Digital Library. Core and Open Journal System are also accessed by 02(18%) respondent libraries for different journals and research articles.

Accessibility to E-Learning Resources

Pakistan Higher Education Commission (HEC) in 2004 has launched access program to 30 online databases and over 45,000 e-books to all universities and nonprofit research institutions to meet the diversified needs of academicians and researchers in the country. According to HEC (2012), nearly 75,000 electronic contents are now available online, which is a unique example of country level access to e-resources in developing countries. (Khan, Amjid 2020).

Table No. 4: Accessibility of E-Learning Resources

E-Learning Resources	Open Database	HEC Digital Library
E-Books	07 (63%)	04(36%)
E-Journal	07(63%)	04(36%)
E-Magazines	08(72%)	03(27%)
E-Thesis/Dissertation/ Reports	08(72%)	03(27%)
CD ROM Database	03(27%)	00

In response to E-learning resources, the 07(63%) respondent librarians at Private Sector University Libraries of Khyber Pakhtunkhwa pinpointed that Electronic books & E- Journals are accessed from Open database followed by 04(36%) accessibility from HEC digital library. E-Magazines,

E-Thesis/Dissertations/Reports were reported as accessed through Open Database and 08(27%) respondent accessed from HEC digital library. Due to emergence of internet technology, the trend of CD ROM databases is decreasing day by day as replied by librarians. Only 08(27%) the libraries access it from open database and no respondent answered for HEC digital libraries of Private Sector University Library.

Librarians Feedback in response to an open-ended question

To provide better technology-based library service and resources to the end users, it is important to provide training on emerging library tools as according to Reitz (2004) training is designed to teach a person or group of people (the trainees) specific skill or a set of skills.

a. Cloud Computing

45% respondent were of the view that cloud computing is the modern emerging trend that support the networking through smart phones and one can give direct print from mobile phone. Cloud printing facility can be utilized through smart phone tablets and laptop from a specified distance via cloud network. The respondents strongly recommended this facility. It will attract more users who often do not visit libraries and it will have definitely a positive impact over the conventional library practices.

b. Cutting Edge Technology

Cutting Edge Technology provide a virtual platform having user interface modules for several library functions such as Artificial Intelligence, Block-Chain Technology, Library Mobile Apps. 3D printers refer to the electronic technologies that have number of advantages and a lay man can utilize them in his/her daily routine. Libraries are also experiencing the same technologies across the globe.

Most of the librarians of Private Sector University Libraries of KP were not even aware of this term but some of them responded “sometime it is very difficult to work in the manual setup because of the growing nature of library material to upgrade, and maintain regularly as they felt the need of modern cutting-edge technology”. Respondent replied that after the consultation of expert the right technology should be opted for the smooth and fluently function within library walls.

c. RFID System

As per the responses received from the librarians of PSUs/DAIs of KP, Radio Frequency Identification system cannot be installed in their libraries due to lack of financial resources. However, respondent librarians replied that RFID system improves library workflow by reducing non-value-added work processes. Staff productivity is increased through better customer service. The check-In inventory process makes easy in book identification for shelving process. Books can be easily identified placed in shelves. Circulation process is fully automated by check-in and self-return system simultaneously. Books selection process can be accurate that reduces the high price material to be purchased.

d. Library Mobile Apps

Emerging technologies play an important role in development of libraries. Library mobile app are helpful for the android applications users as it is linked with database that is updated and reminders are sent to mobile user regarding book issue/return and overdue date.

In response to library mobile apps, one of the university libraries explains that they have built their own library website where they have kept an option for library mobile app

in which students and faculty are sent reminder on regular basis for library material updates.

e- **Budget Allocation**

Budget constraints exist to implement modern trends almost in all the respondent university libraries. The response rate to allocate budget for the emerging trends was 100% all the respondents' libraries were of the view that private sector universities should allocate sufficient funds to develop a modern and up to-date libraries.

Respondent also comment that all the PSUs/DAIs management should design a financial plan for the development of e-libraries. In this regard HEC grants and funds assistant programs should be initiated by institutions management for E- learning resources and E-library development. Response rate was 27% out 11 respondents that KP government should take some practical steps to arrange sufficient budget for the development of modern libraries in private sector specially. Most university libraries spent budget to purchase books and other literary material, 36% respondent were of the view that librarians and all LIS professionals should be involve in the preparation of library budget at university level as they are well aware of modernization of libraries.

Problems faced by the librarians

About half of the respondents' i.e. 60% comment that they face following problems while using emerging library trends. The following responses were recorded:

- Lack of skilled (IT-Trained) professionals in Library and information Science
- Lack of software installation and data import training.
- Unavailability of required materials
- Lack of technical/IT staff
- Lack of user education (emerging trends)
- Lack of adequate computers
- Internet speed connectivity
- Power failure

There is a serious and urgent need for IT-based trained staff in LIS schools to provide the necessary technology-based training on these emerging library trends. Responding librarians felt that the development and implementation of uniform standard integrated library software was the need of the day. They suggested that the library standards used in university libraries must be uniform. Librarians also urged to provide the modern technology needed for all university libraries.

Recommendations for the PSUs/DAIs Libraries in Khyber Pakhtunkhwa

- To improve the present situation of the private sector universities, more budgets should be allotted to purchase modern technology equipment for the libraries. The Government of Khyber-Pakhtunkhwa should provide some financial assistance for the upgrading, and modernization of PSUs/DAIs Libraries
- Library professionals should enhance their skills related to emerging technologies and its related areas afterward, they must focus on updating the electronic resource for library patron. To quench the information thirst of any user, librarian should be smart enough to develop a web-based home- page to provide online service.
- Universities possess a reasonable strength of female students. The hiring of female librarians should be encouraged by higher up of the PSUs /DAIs Libraries in Khyber Pakhtunkhwa.

- Universities are research-based institutions, their libraries must be administered by professional librarians, preference should be given to highly qualified library professionals such as PhD and MPhil degree holder must be acquired, to promote research-based activities
- The employment of technologically skilled staff helps to make most of the systems easily and efficiently accessible in university libraries. It is recommended that there is a dire need of ICT skilled teaching staff in the LIS Schools to deliver the necessary technology-based training needed in the 21st century.
- Adequate computer workstations along with printers to fulfill the users need in order to save the time of both user and librarian. University libraries should have latest computer systems, printers, scanners, Bar Code readers, DVD writers and CD Writers etc. It is essential to have good integrated multilingual latest version software.
- PSUs/DAIs libraries in Khyber Pakhtunkhwa should implement some practical steps to continuously offer an updated library services with the help of latest equipment and software.
- The selection and appointment of IT human resource for research and professional development programs in modern technologies are indispensable tools for the development of expert and professionally sound library professionals.
- Library administration must project some policies for training and drill of librarians in order to keep them update with relevant skills and necessities for delivery of online e-resources. The library professionals should be given periodic training on these emerging library technologies.
- In order to get benefit from all the available resources in university libraries, an inclusive and efficient network for the technical services of libraries (cataloguing, budget control, serial control) should be deployed. This setup will be helpful to improve the library functions, also to avoid duplication.

Accessibility to the E-Resources are now very common through Digital library, Hybrid Library, Electronic library and HEC digital libraries. The parent body of these libraries should take initiative to arrange some seminars and workshops, for the library professionals and patrons to know the use and get benefits. To design several standards and policies for the implementation of relevant parameters required for Electronic Libraries, Digital Libraries, and Hybrid Libraries

Conclusion

Appropriate budget should be provided to install the required infrastructure to have an adequate modern well-equipped library. Standardized and well-defined policy should be adopted for digitization of library holdings. University must offer some user education and ICT based training to the library professionals. Special periodic training should be given to the library professional on library software such as Koha, Greenstone, DSpace. Hiring of professional and qualified staff should be encouraged to administer the libraries.

References

- Abram, S. (2008). Social libraries – the librarian 2.0 phenomenon. *Library Resources & Technical Services*, 52(2), 19-22

- Adegbore, A. M. (2011). University faculty use of electronic resources: a review of the recent literature. *PNLA Quarterly*, 75(4), 1-7.
- Ahmed, W. (2015), "Third generation of the Web: libraries, librarians and Web 3.0" *Library Hi Tech News*, Vol. 32 No. 4, pp. 6- 8. <https://doi.org/10.1108/LHTN-11-2014-0100>
- Ali, K.S, & Dr. Khan KM *Emerging Web Based Technologies for Library and Information Services in the Knowledge Era* Research Scholar, DLIS, Mangalore University, Mangalore
- Arms, W. Y. (2005). *Digital Libraries*. New Delhi: Ane Books.
- Atkinson, R. (1996). Laying claim to the control zone: Library functions, scholarly communication and the foundation of the Digital Library. *Library Quarterly*, 66, 249
- Back, G., & Bailey, A. (2010). Web Services and Widgets for Library Information Systems. *Information Technology and Libraries*, 29(2), 76-86. <https://doi.org/10.6017/ital.v29i2.3146>
- Bali, A. (1997). Collection development in NISTADS library. DESI
- Bavakutty, M, Muhammad Salih T.K., et.al. (2006). *Research on library computerization*. New Delhi: Ess publication. P.6-9
- Bavakutty, M., Salih, T. M., & Haneefa, K. M. (2006). *Research on Library Computerisation: Computerisation of university libraries*. New Delhi: Ess, p.249.
- collections in' University Libraries of Khyber Pakhtunkhwa, Pakistan: *Pakistan Library & Information Science Journal* . Jul-Sep 2020, Vol. 51 Issue 3, p24-38. 15p
- David Lee King & Stephanie Willen Brown (2009) *Emerging Trends, 2.0, and Libraries, The Serials Librarian*, 56:1-4, 32-43, DOI: 10.1080/03615260802672452
- Emerging Trends, 2.0, and Libraries, The Serials Librarian, 56:1-4, 32-43, DOI: 10.1080/03615260802672452
- Fabunmi, B., A., Paris, M. and Febunni, M., 2006. Digitization of library resources: challenges and implications for policy and planning. *International Journal of Africa & African American Studies*, 5(2), pp.23-
- Fiankor, D. K., & Akussah, H. (2012). Information use and policy decision making by district assembly members in Ghana. *Information Development*, 28(1), 32-42.
- Foster, K, Heppensta, R, Lazarz, C. & Broug, E. (2008). Emerald academy 2008 authorship in Africa. <http://info.emeraldinsight.com/pdf/report.pdf>
- https://en.wikipedia.org/wiki/Online_public_access_catalog#Nextgeneration_catalogs
- Hussain, A. (2019) University Library ranking of public Sector University in Khyber Pakhtunkhwa: A proposal, (Unpublished Thesis). *Department of Library and Information Science*, Sarhad University of Science & Information Technology, Peshawar.
- Jan , Saeed ullah & Rafia A. Sheikh (2011) Automation of University Libraries: a comparative analysis of Khyber Pakhtunkhwa and Islamabad, Pakistan. *Library Philosophy and Practice, USA*, July issue. Available at: <http://www.webpages.uidadho.edu/~moblin/jan-sheikh.htm>
- Jan, S. U., & Sheikh, R. A. (2011). Automation of university libraries: a comparative analysis of Islamabad and Khyber Pukhtoon Khwa, Pakistan. *Library Philosophy and Practice*(1), 21.
- Jan, Saeed ullah & Rafia A. Sheikh (2011). HEC Digital Library: an overview. *Microeconomics: Search; Learning; Information Costs & Specific Knowledge; Expectation & Speculation*, New York: 2(149), September issue.
- Jerry Arokyamary, R., & Ramasesh, C. P. (2011). Emerging Trends and Technologies: Impact of Information Communication Technologies (ICTs) On Libraries and LIS Professionals. *My SCIENCE*, 7(1-2)), 34-41

- Kelley M (2012) .*OCLC offers websites for small libraries*. Pg.9.
- Kemp, D. A. (1976), "Nature of knowledge: and introduction for librarians"; Clive Bingley, London.
- Khan et all (2020). *Financial Management of*
- Khan, Amjid and Ahmed, Shamsahd(2020) "Usage of E-Databases and E-Journals by Research Community in Pakistani Universities: Issues and Perspectives" (2020). *Library Philosophy and Practice* (e-journal). 4570. <https://digitalcommons.unl.edu/libphilprac/4570>
- Leedy, P. (1993). *Practical research: planning and design*. New York: Macmillan, 150-151
- Leiner, B. M., Cerf, V. G., Clark, D. D., Kahn, R. E., Kleinrock, L., Lynch, D. C., . . . Wolff, S. S. (1997). The past and future history of the Internet. *Communications of the ACM*, 40(2), 102-108.
- Mahmood, K. (2008). Library web OPACs in Pakistan: an overview. *Program*, 42(2), 137-149.
- Mairaj, M. I. (2016). Use of University's Library Websites in Pakistan: An Evaluation. *Pakistan Journal of Information Management & Libraries (PJIM&L)*, 14, 3-8.
- Malik, Khalid Mahmood (1995). Status of library automation in Pakistan.*PLBXXVI* (1).pp.24-25.
- Maness, Jack M (2006) "Library 2.0 theory: Web 2.0 and its implications for libraries." *Webology* 3.2 (2006):
- Michael E. Casey and Laura C. Savastinuk, "Library 2.0: Service for the Next Generation Library,"*LibraryJournal*,September 1,2006, <http://www.libraryjournal.com/article/CA6365200.html> (accessed July 30, 2007).
- Molnar, D., & Wagner, D. (2004). *Privacy and security in library RFID: Issues, practices, and architectures*. Paper presented at the Proceedings of the 11th ACM conference on Computer and communications security, pp. 210-219.
- Murthy, T. & Cholin, V. & Vijayakumar, Jk. (2005). UGC-Inflibnet initiatives in e-journal consortia and digital library of doctoral theses for Indian universities.
- Murthy, T., Kembhavi, A., & Cholin, V. (2004). Access to Scholarly Journals and Databases: UGC-INFONET E-Journals Consortium. *University News*, 42(34), 1-5.
- Nicholson, J. (2017). The library as a facilitator: How bitcoin and block chain technology can aid developing nations. *The Serials Librarian*, 73(3-4), 357–364. doi:10.1080/0361526X.2017.1374229
- Nok, G. (2006). The challenges of computerizing a university library in Nigeria: the case of Kashmir Ibrahim Library, Ahmadu Bello University, Zaria. *Library Philosophy and Practice (e-journal)*, 78.
- O'Reilly, T., & Battelle, J. (2004). Opening welcome: State of the internet industry. *San Francisco, California, October, 5*.
- Ondieki Makori, E. (2013). Adoption of radio frequency identification technology in university libraries: A Kenyan perspective. *The Electronic Library*, 31(2), 208-216.
- Qutab, Saima & Khalid Mehmood (2009). Library web sites in Pakistan: an analysis of the content. *Emerald*, (43)4 pp.430-445
- Rehman, S. U (2012) Measuring service quality in public and private sector university libraries of Pakistan. *Pakistan Journal of Information Management and Libraries*, 13(1), 1-11.
- Reitz, J. M. (2004). *Dictionary for library and information science*. West Port: Rain Tree Publishers Susan, V. I.. and Raju, Y. (2015
- Russell, S. J., & Norvig, P. (2016). *Artificial intelligence: a modern approach*. Malaysia: Pearson Education Limited. Shen,
- Shimray, S. R., & Ramaiah, C. K. *Return on Investment in Academic Libraries*

- Stephens, M., M. Collins, 2007. Web 2.0, Library 2.0, and the Hyperlinked Library. *Serials Review* 33(4): 255-256.
- Stephens, Michael. "Web 2.0 for Libraries: Best Practices for Social Software." *Library Technology Reports* (Chicago, IL: American Library Association, July/August 2006).
- Susan Mathew, K., & Baby, M. D. (2011). *Impact of information communication technology (ICT) on professional development and educational needs of library professionals in the Universities of Kerala* (Doctoral dissertation, Cochin University of Science & Technology)
- Taylor, Dena. (2005). The literature review: a few tips on conducting it. [Online]. Available at <http://www.utoronto.ca/writing/litrev.html> (Date visited: 10.9.2008)
- Tiwari, A. (2002). *Evaluation of electronic libraries*. APH Publishing Corporation.
- Travis, T., & Tay, A. (2011). Designing low-cost mobile websites for libraries. *Bulletin of the American Society for Information Science and Technology*, 38(1), 24-29.
- Ur Rahman, A., Idrees, H. and Khan, Arif. (2016) Prerequisite and awareness status of Web 2.0 applications in University Libraries of Khyber Pakhtunkhwa, *Library Hi Tech News*, Vol. 33 No. 8, pp. 5-7. <https://doi.org/10.1108/LHTN-04-2016-0019>
- Uwaifo, S. O. (2013). Librarians in Use of Internet by University Libraries in the South-South Zone, Nigeria. *International Journal of Scientific & Technology Research*, 2(3), 290-294.
- W. W. & Lin, J. M. (2018, August). Robot assisted reading: a preliminary study on the robotic storytelling service to children in the library. In *International Conference on Innovative Technologies and Learning* (pp. 528-535). Cham, Switzerland: Springer. 10.1007/978-3-319-99737-7_56