

## Influence of Technological Advancements on Traditional Services of Library and their Modernizations

**H.Kalilur Rahman**

Librarian

Higher College of Technology  
PO Box 74, Postal Code 133  
Al-Khuwair, Sultanate of Oman  
Email: hkalilurr@gmail.com  
kalilur.rahman@hct.edu.om

***Abstract** - Most of the traditional services of library are not obsolete but they are in transitional stage because of technological advancements particularly due to the development in the field of information and communication technology (ICT). Enormous growth in digital publication has changed the process of collection development. Likewise the library services are getting new momentum and entering into new phase. The users' anticipations have reached new pinnacle. Though the main mission of the library is still unchanged, the library has to invent new ways of operation to perform well as well as to accommodate the Internet savvy users' expectation. These problems are to be properly addressed to make the library more functional and viable. Pragmatic solutions have to be found by using ICT to resolve these issues. In order to enhance the quality of the library services, the library professionals should empower themselves to acquaint well with these hi-techs as a first step. The library service is one of the core areas of the library and facing many problems at the moment. This paper analyzes the latest trends and problems related to the traditional library services as well as emerging new services specifically collection development, information seeking behavior, information literacy, accessibility, library space and library website. Moreover, it proposes strategies to rejuvenate the traditional services and mechanisms to incorporate the emerging new services into library.*

**Key words:** Library Services, Collection Development, Information Seeking Behaviour, Information Literacy, Library Website and Library Space.

### 1. Introduction

The exponential growth of information primarily in digital form and advent of ICT are prime reasons for the radical change in library and its traditional services. These improvements play a vital role in all spheres of library operations as well as put the library professionals to rethink the conventional way of functioning. Previously, investing in library resources and providing minimum publicity were enough to utilize the library effectively. Both concepts have now changed tremendously. The library requires massive budget to build-up its resources and has to take much effort to reach the users because most of the users immediately approach the Internet for their information requirements. Collection development and equipping the library professionals with the latest technology to meet the current scenario have become daunting task and basic necessity. This study concentrates on impact of technology on traditional library services, how to improve those services and how to implement new services to reach its patrons.

## **2. Review of Literature**

The library is constantly under the clutches of technology. It necessitates revitalizing the operations of the library by embracing those technologies. “Technology will continue to change, and libraries and librarians have to use the changing technology to provide the best access and service to their patrons. Electronic information creates challenges for the library community at its very foundation, moving it away from the traditional paper-and-print format to an ethereal world of circuits and connectivity. The library is no longer defined simply as a building or a physical repository that houses information (Gurjeet Kaur 29). According to the Horizon Project's report, academic libraries will continue to be impacted by changing technologies and related standards, including electronic publishing, mobile apps, bibliometrics and citation technologies, open content, the Internet of things and the semantic web and linked data (Johnson, L., Adams Becker, S., Estrada, V., and Freeman, A. 32). Another research shows that user expectations are high and users would embrace wider use of technology at libraries such as online research services allowing patrons to pose questions and get answers from librarians, apps-based access to library materials and programs, GPS navigation apps to help patrons locate material inside library buildings, and kiosks located throughout the community where people can check out books, movies or music without having to go to the library itself (Zickuhr, K., Rainie, L. and Purcell, K. 3).

The digital technology has revolutionized resources of the library and is the reason for the emergence of information sources in multidimensional formats. “The new procedures that made sense for managing collections only thirty years ago have been turned topsy-turvy by changes in higher education and publishing, by the emergence of the new digital information system, and by a weak library economy” (Branin, J.J., Groen, F.K., and Thorin, S.E. 11). Stephen S. Crandall and Toni P. Olshan mentioned in their work that “The web has altered the process of acquisitions and collection development. The trend of delivering access to electronic resources impacts the relationship between libraries and publishers. Creation of library consortia has been a response to these changes so libraries can insure more favorable pricing than they could on their own” (217).

Today, another wave of library space design is in process. Many in the field of higher education refer to this design phase as one that is focused on creating library learning spaces. A top priority for these library learning spaces is to connect students to technology, information, and co-curricular learning — learning that deliberately complements the formal classroom activities, programs, and experiences that contribute to student learning. Ultimately, the emphasis is on holistic learning that may occur both inside and outside of the classroom. Versatility is essential to the planning and design of library learning space. (Alison J9).

## **3. Objectives of this Study**

The primary objective of this study is to analyze the influence of the technological advancements on traditional library services. This paper focuses on what areas are leveraged heavily by the technology, what kind of transformations have been taken place so far, what is the duty of the library professionals to deliver high quality services by using the latest technologies and what steps are required to stay relevant in the information technology age.

The first part of the paper elucidates the problematic areas where the library has great setback in its operations. In the second part, attempts have been meticulously made to explain the

strategies to overcome the identified problems and to apply the new technology in library services.

#### **4. Impact of Technological Development on the Traditional Services of Library**

Procurement of books, subscription to journals and e-resources were the routine functions of the library to fulfill the information request of the parent institution. Furthermore, they acted as storehouse of such information resources for the present and future needs. Facilitating the users to use these resources is another task of the library. Creating catalogues for the information resources available in the library as well as arranging them logically by using the standard classification system were the main job of the library. It has extended to another level. "Libraries play different roles for different people. To some, a library is a place to read books; be furnished with the current news from up-to-date newspapers; to do research; a place to access or share information in response to a particular need; etc. Nowadays, libraries and librarians play an important role in providing access to information, organizing it, and helping users to find the information they need" (Mayega 1). Advent of ICT has redefined the perception of library services. Before, the term library service was meant for library induction, circulation of books and reference services mainly. In the digital environment, it covers broader area as well as has new sense. Providing access to online resources both inside and outside the campus, creating more interactive library website, using mobile technology, and also redefining the library space for different purposes are coming under the library services. The conventional roles of the library are in a state of transition and require more attention to make them suitable for the ever changing environment. Technology has given new impetus to circulation service, reference service and library induction. The following section details how the primary operational areas of the library have been affected by the influence of technology:

##### **4.1. Collection Development**

Digital technology has made profound impact on the acquisition process. Digital information has begun to dominate in the field of scholarly publication. Responding to this emerging trend is the responsibility of the library. Multidimensional formats of resources and plethora of open resources play key roles. Users' thought has shifted towards instant results and information. All these factors are deeply leveraging in developing the library collection as never before. Ever increasing subscription costs as well as continuous budget cut are severely affecting the acquisition process. As a result of these, the library is unable to enrich its collection constantly. Another new problem is that library space should be remodeled to suit diverse nature of collections in which handling e-resources is one of the areas. Ultimately it causes serious repercussions in the library services. The collection development has got high priority. If the library collection is not up to the expectation of the parent institution and users' demands, the library cannot serve well which will subsequently make worse the services of library.

##### **4.2 Information Seeking Behaviour**

Present day users are digital users. Their behavior is governed totally by technology. Their search does not include only print resources but also covers open source e-journals, e-books, digital repositories and most importantly search engines. In addition, it contains social media, scientific blogs and forums. Strategically these parameters should be reflected in the library services to reach the users to serve in a better way. The users heavily rely on the Internet for

their information requirement whether it is for academic purpose or for personal use. Perception of the users about library has not changed much. Besides information seeking behavior varies from person to person, based on needs and their skill. It cannot be generalized, but the library must cater to the need of all kind of users. In library, information search is still a tiresome process as each resource adopts different type of searching mechanism and it eventually confuses the users. “Web search engines and Google in particular have created a generation of searchers who are choosing the simplicity of search engines on the open free web over the perceived complexity of library services (Jan Brophy and David Bawden 498).

### **4.3 Information Literacy**

Though the library orientation is century old phenomena, technology has renovated the library orientation beyond the recognition. Proliferation of information resources in all formats necessitates overall modification. The value of the resources available in the library should reach users to maximize their usage. The patrons should acquire information literacy skills to accomplish this task. Equitable access to all resources is prerequisite one to succeed in their academic endeavor. Creating awareness about the resources available in the library and train the users to use different nature of resources particularly online resources will be the solution for this problem. Another problem in this area is lack of proficiency among library professionals to conduct the information literacy programs. ICT makes it attainable. The librarians should initially empower themselves to train the users proficiently. Aggressive marketing is inevitable one and will pave the way to get good returns for the huge investment on the resources. The library should include these activities in their action plans. The term information literacy has emerged as new and delivers the same in a highly sophisticated manner.

“In the present time, the problem is not the lack of information but the main problem is significant use of the available information and information sources. In approximately cases users find difficulties to determine the right information due to lack of search skills. The information literacy (IL) plays the significant role in proper utilization of information, developing search skill and inception of knowledge (Meetu Gupta and Rakesh Pant, 267)”.

### **4.4 Library Space**

The patrons want to use the library for variety of purposes. Their approach moves along with their needs in using the library. As the patrons visit the library not only to borrow books but also for other curricular and co-curricular activities, the space saving of the library is not feasible. Indeed, the library is committed to have more functional areas than before. In the academic environment, the students want to discuss, study seriously without any disturbance, conduct meetings, perform research work and access e-resources through electronic gadgets. It compels that the library building must be multifunctional to suit these needs and also to maximize the usage of the library. Rooms for group discussions, sound-proof rooms for serious study and also break-out areas with soft furnishings and couches have become mandatory for the academic library in the digital era. Redesigning library space is a rejuvenating process to restore its old stature. Integrating these changing needs with library space is unavoidable at this juncture to remain relevant to the evolving needs.

## 5. Strategies to Use the Technologies to Overcome the above Identified Issues

### 5.1 Revamping the Collection Development Process

The library services are affected by various factors in which the resource development is a major one. This paper is basically paying attention on issues related to the services of the library, not on overall resource procurement matters. At the same time, it is impossible to update the library services by keeping conventional policies in building the library resources. The exponential growth of electronic resources, escalating cost of both print and digital scholarly journals, and constraints in the library budget extremely impinge on core functionalities of the library. The library collection development policy must be revised and include both print and digital resources, formation of library consortium and effective use of open sources. Inclusion of resources in all formats in the library is a basic necessity. Perceptions of users are composite regarding the library resources. They have to be tackled successfully to stay relevant in the Internet era. The customary way of purchasing print books and subscription to print journals is not sufficient to meet the demand of the users, but adding e-resources is the way to overcome this obstacle. Many factors are to be considered to develop digital collection because of their complexity nature. Though the contents of e-resources are pertinent to curriculum of parent institutions, other aspects such as currency, licensing agreement, access permission, reliability, functionality, ownership, compatibility, authentication, technical support from vendors, training, purchase models, pricing and other related matters should be contemplated while selecting e-resources. Consultation with academic departments to confirm relevancy and IT department to deal with technical matters are essential before taking final decision.

Library consortium is another developmental pattern to bolster the library services. This collaborative approach makes the library to overcome budget limitations, permits the users to access broader range of resources and fulfills information necessities of the users. As ICT simplifies the job of forming consortium, it is a right approach to help our patrons to provide more resources at reduced price. Identical type of institutions can form the library consortium. It will ease the process of identifying the resources that are having high demand among the participating institutions. There are different types of business models such as perpetual access; pay-per-view and outright purchase to subscribe to e-resources. These models ease the process of selecting the e-resources based on their best offer. A dedicated website can be developed exclusively for the consortium to provide secure access on a single platform to member libraries where other features like discussion forum, chat facilities, tag etc. can be made to discuss on issues of common interest and also to help the users. Consortium model is growing fast globally. United States has the highest number of academic consortia according to the International Consortium of Libraries Consortia (ICOLC). One of the leading academic library consortia projects is Ohio Link; The consortium of Ohio University libraries which emerged in 1987. Council of Australian University Librarians is an Academic and Special Libraries Consortium for 70 universities and institutions in Australia and New Zealand. In Europe, The New European Library, a research portal is multi-countries consortia provides access to resources for researchers in many subjects (Laila Samea, 132-133). In India, Ministry of Human Resource Development (MHRD) has formed e-ShodhSindhu merging three consortia initiatives, namely UGC-INFONET Digital Library Consortium, NLIST and INDEST-AICTE Consortium. The e-ShodhSindhu will continue to provide current as well as archival access to more than 15,000 core and peer-reviewed journals and a number of bibliographic, citation and factual databases in multiple disciplines from a large number of publishers and aggregators to its member institutions including centrally-funded technical



institutions, universities and colleges (inlibnet.ac.in). Ultimately technology opens many doors to enhance the quality of the library services.

As providing required information is the top-level responsibility of the library, the library must equip itself to fulfill its objective. Exploring the possibilities of using open resources in this contemporary world is one of the ways. "Main motivations behind open access (OA) initiatives were: high subscriptions rates, which were difficult to afford, and the large price discrepancy between individual and institutional subscription rates. Consequently libraries ended up paying huge subscriptions for journals and they were becoming more restrictive. OA provides free, immediate, permanent online access to the full text of research articles for anyone, web-wide. Open access provides several benefits to researchers, educators, journals, publishers, funding agencies, government and academic institutions around the world. It is an effective vehicle to information exchange between all countries. The total number of open access journals continues to rise" (Priti Jain<sup>3</sup>). Currently, large number of open access e-books and e-journals are available in almost all fields of knowledge. Several well renowned organizations are pioneering open source movements to remove hurdles in accessing scholarly information and also to solve the ever increasing subscription cost to some extent. The library may well use open source e-books and e-journals relevant to their curriculum, and should inculcate this culture among its users. Only peer reviewed and good impact factor open access e-journals are to be made available on the library website. Similarly, large numbers of free high quality e-book websites can be found on the Internet. The library professionals with the help of faculty must identify pertinent open source e-books websites and have to give proper link on the library website for easy access. Maintaining high academic standard in selecting open sources is one of the criteria. A separate section on the library website can be created exclusively for open source e-journals and e-books. In addition, metadata of open sources can be harvested and stored in the institutional repositories for easy and anytime access. Useful e-books can also be downloaded to store in the institutional repositories after checking their copyright rules. Most of open educational resources permit to use them for academic purpose without any restrictions. This sort of actions will help library to sustain and will make more functional.

## **5.2. Information Seeking Behaviour and Role of Information Literacy (IL)**

Consistent growth of e-resources poses a threat to information searching process. Astounding developments in the field of ICT assist library professionals to resolve this snag. Researchers in information searching field strive hard to provide better solution to the problem. At present, powerful single search discovery tools are available to search simultaneously OPAC, digital library, e-resources subscribed by the library and open sources. They are user-friendly, faster, having multiple features to narrow down or expand the search and able to display results with relevance ranking. Here, the patrons need not know which database or resource they have to search first. It streamlines the information searching process, makes all resources discoverable and improves visibility. Summon by ProQuest, EBSCO Discovery Service, OCLC WorldCat, Ex Libris's Primo Central, LibraryFind, VuFind and Scriblio are some important discovery tools which have been developed to overcome these sorts of hurdles. Using anyone of this kind of discovery tools will be the solution for this problem and will also augment the information searching process.

Providing training to the users is the next step to use these discovery tools competently in order to get the needed information. Delivering full-fledged IL programs in the library can solve many complications in information seeking behavior. IL becomes an essential service

to equip the library patrons to accomplish this task. ICT redefines the concept of conducting the library orientation. IL programme is imperative to optimize the utilization of the library and will empower the users to use all type of resources. The cutting-edge computer technology simplifies the job of creating online IL tutorials with multimedia capability. It permits the library professionals to evaluate the tutorials and to track the usage as well. The users' need differs based on their level and study. Different level of skill is required as well. IL modules encompassing various types of information resources, search strategies, evaluating the retrieved information, using the information ethically and effectively, and citation methods can cater to the need. How to frame queries, how to use various options such as advanced level option, keyword option; and how to search print, digital sources and open sources on the Internet are to be part of search strategies in IL modules. Ethical part may have copyright infringement issues and how to avoid plagiarism. Most importantly IL programs have to be designed to meet specific needs for courses offered in the particular academic institution and should be customizable. IL programs must comprise modules with these elements to provide in-depth training to all level of students including research scholars to make everyone information literate and life-long learners. The library professionals must accustom well with all modules to deliver IL program in a befitting manner.

### **5.3. Services through Library Website**

The library website is very much connected to modern services of the library. It ensures omnipresence of the library among its users. Variety of the services can be offered through the library website including access permission to its e-resources. It is gateway of the modern library. OPAC on the library website with sophisticated search features will help patrons to find the library collections wherever they are. Traditional current awareness service, conveniently could be called as Alert Service can be offered to the patrons to know the latest additions in the library. This service can be fine-tuned to send emails automatically to the patrons whenever new items are added in their field of study. Traditional current awareness service has got new facelift. As search is a primary action on the library website, it has to be prominent on the homepage of the library website. Single search box on the homepage will pave the way to search all simultaneously. Advance search feature must be simple with proper description. Save option on the user account will enable the users to refer the same in future. In addition subject guides, suggestion boxes, chat facility, forum, course guides, citation sources, information literacy tutorials, digital repositories, list of new arrivals, latest information, inter-library loan facility, useful links, study room reservations and discussion forum etc. can be provided through the library website. The users can be allowed to rate, tag and comment on the library collections which will benefit other users. 'Ask Librarian' service is an effective way of offering conventional reference service. Reference service has become a virtual service. Reference librarians could be contacted anytime without any geological barrier and can answer instantaneously. It will transform the way of functioning and will help to establish relationships among patrons.

Above all, library website has to be user friendly. Homepage must be impressive and not be cluttered. While giving essential information on the website to the patrons using plain language will avoid confusion. Periodically, conducting website usability test is a good strategy to enhance its utilization. The usage of mobile devices is snowballing. Developing mobile optimized library website is vital to respond the users' needs. The library website expands horizon of the library, allows playing different roles and helps the library to be more interactive.

#### **5.4 Accessibility**

Developing library collection is one of the fundamental duties of the library and making them available to everyone is also equally important. Easy reach and better accessibility are need of the hour. Providing access facility in different platforms such as, intranet portal, library website and mobile apps is absolutely feasible. Electronic gadgets for example desktop, laptop, notebook, i-pad, tablet and smartphone can be used to access the library resources through these platforms. It is an upcoming trend and will enable patrons to access the library resources from any remote places at any time effortlessly. This will holistically support teaching and learning process. ICT has created avenues to access them in multiple ways. Developing mobile apps is feasible in the current circumstance and will increase the accessibility. All these can bridge the gap between library and end-users in utilizing the e-resources. Additionally, mobile app will facilitate the users to avail all online library services. The library can equip itself to provide access to all its resources by using ICT.

#### **5.5 Library Space**

Creating user-centered spaces inside the library has become a part of library service as it serves the users in numerous ways. The library professionals should contemplate developing versatile areas to address the needs of wide range of users for their different type of learning inside the library. Increasing reliance on digital resources is main reason to reshape the library space. Creating conducive environment for the users is also library service. The perception of conducive environment has drastically changed in the modern days. Going beyond the old-fashioned reading room is indispensable one to be productive in the academic environment. Changes in pedagogy create new opportunities to the library to play dynamic role in the academic environment. The library can be an integral part of colleges and universities in strengthening students' information skills, reading skill, writing skills and communication skills. The overall services have shifted from traditional way of functioning to user-centric way of functioning. Room for collaborative study is a new demand where the users can discuss and present their works. Likewise, quiet study area is another requirement for individual study. The study carrels with shelves, power sockets and wireless Internet access facilities will suit this kind of need and can isolate the users. Lounge furniture for reading newspaper and other leisure reading will also attract the users. Wi-Fi facility to use laptops and electronic gadgets, Computers with Internet connection and necessary software, printer facilities, projectors for presentation and video conferencing are inevitable in the contemporary academic library. These facilities will endow the library to take part in teaching and learning, and will convert as an intellectual learning resource center.

#### **6. Conclusion**

This study elaborates some major operations of the library and how they have been affected by the rapid advancement of technology. Furthermore, it pinpoints the way to utilize the technology in delivering the library services to overcome the identified problems and also to perform up to the expectation of the modern users. Besides new paradigm shift in some major functional areas of the library such as library induction and web-based services have been deliberated in detail. It has also been described that how the digital information has revived library collection and indirectly plays a crucial role in reshaping the library services. Renovation of library building to make use of the library space for teaching and learning is another innovative and needed strategy which was not part of the library responsibility before. This study has revealed the fact that continual growth in ICT will create new



challenges, and the library should be in a position to confront these challenges to play a prominent role in accomplishing mission of its parent institution and also to satisfy the users' information demand persistently.

## 7. References

1. Gurjeet Kaur (2015). The Future and Changing Roles of Academic Libraries in the Digital Age, *Indian Journal of Information Sources and Services*, ISSN: 2231-6094, 5(1), pp. 29-33.
2. Johnson, L., Adams Becker, S., Estrada, V., and Freeman, A (2014). *NMC Horizon Report: 2014 Library Edition*. Austin, Texas: The New Media Consortium, (<http://cdn.nmc.org/media/2014-nmc-horizon-report-library-EN.pdf> retrieved January 02, 2018 ).
3. Zickuhr, K., Rainie, L. and Purcell, K. (2013). *Library Services in the Digital Age*. (<http://libraries.pewinternet.org/2013/01/22/Library-services> retrieved February 10, 2014).
4. Branin, J.J., Groen, F.K., and Thorin, S.E. (2000). The Changing Nature of Collection Management in Research Libraries, *Library Resources & Technical Services*, 44(1), pp. 1-17.
5. Crandall, Stephen S. and Olshan, T.P. (2002). *Acquisitions and Collection Development in Business Libraries*. In: Karp, R. S. (ed.) *The Basic Business Library: Core Resources*. 4th Ed. Westport, CT: Greenwood Press. pp. 217-230.
6. Alison J (2016), *Planning and Designing Academic Library Learning Space: Expert Perspectives of Architects, Librarians and Library Consultants*. Santa Rosa, CA: Project Information Literacy: Practitioner Series research report (Retrieved from [http://www.projectinfolit.org/uploads/2/7/5/4/27541717/pil\\_libspace\\_report\\_12\\_6\\_16.pdf](http://www.projectinfolit.org/uploads/2/7/5/4/27541717/pil_libspace_report_12_6_16.pdf) on 24-Jan-2018)
7. Mayega, Stephen (2008). *Library Information Services in the Digital Age*. Fourth Shanghai International Library Forum (SILF 2008), Shanghai (China). (Retrieved from <http://eprints.rclis.org/12567/> on 16-Jan-2018) pp. 1-8.
8. Jan Brophy and David Bawden (2005). Is Google enough? Comparison of an internet search engine with academic library resources, *Aslib Proceedings: New Information Perspectives*, 57 (6), pp. 498-512.
9. Meetu Gupta and Rakesh Pant (2017). Influence of Information Literacy on Students of G.B. Pant University of Agriculture and Technology, *International Journal of Research –Granthaalayah*, 5 (2), pp.266-278.
10. Priti Jain (2012), *Promoting Open Access to Research in Academic Libraries, Library Philosophy and Practice*, (Retrieved from <http://digitalcommons.unl.edu/libphilprac/737> on 11-Jan-2018)
11. Laila Samea (2015). Academic library consortia in Arab countries: An investigating study of origins, development, and services, *International Journal of Library and Information Science*, 7(7), pp.130-147.
12. e-Shodhsindh consortium portal <https://www.inflibnet.ac.in/ess/about.php>, retrieved on 30th Jan 2018.



## Influence of Technological Advancements on Traditional Services of Library and their Modernizations

**H.Kalilur Rahman**

Librarian

Higher College of Technology  
PO Box 74, Postal Code 133  
Al-Khuwair, Sultanate of Oman  
Email: hkalilurr@gmail.com  
kalilur.rahman@hct.edu.om

***Abstract** - Most of the traditional services of library are not obsolete but they are in transitional stage because of technological advancements particularly due to the development in the field of information and communication technology (ICT). Enormous growth in digital publication has changed the process of collection development. Likewise the library services are getting new momentum and entering into new phase. The users' anticipations have reached new pinnacle. Though the main mission of the library is still unchanged, the library has to invent new ways of operation to perform well as well as to accommodate the Internet savvy users' expectation. These problems are to be properly addressed to make the library more functional and viable. Pragmatic solutions have to be found by using ICT to resolve these issues. In order to enhance the quality of the library services, the library professionals should empower themselves to acquaint well with these hi-techs as a first step. The library service is one of the core areas of the library and facing many problems at the moment. This paper analyzes the latest trends and problems related to the traditional library services as well as emerging new services specifically collection development, information seeking behavior, information literacy, accessibility, library space and library website. Moreover, it proposes strategies to rejuvenate the traditional services and mechanisms to incorporate the emerging new services into library.*

**Key words:** Library Services, Collection Development, Information Seeking Behaviour, Information Literacy, Library Website and Library Space.

### 1. Introduction

The exponential growth of information primarily in digital form and advent of ICT are prime reasons for the radical change in library and its traditional services. These improvements play a vital role in all spheres of library operations as well as put the library professionals to rethink the conventional way of functioning. Previously, investing in library resources and providing minimum publicity were enough to utilize the library effectively. Both concepts have now changed tremendously. The library requires massive budget to build-up its resources and has to take much effort to reach the users because most of the users immediately approach the Internet for their information requirements. Collection development and equipping the library professionals with the latest technology to meet the current scenario have become daunting task and basic necessity. This study concentrates on impact of technology on traditional library services, how to improve those services and how to implement new services to reach its patrons.

## **2. Review of Literature**

The library is constantly under the clutches of technology. It necessitates revitalizing the operations of the library by embracing those technologies. “Technology will continue to change, and libraries and librarians have to use the changing technology to provide the best access and service to their patrons. Electronic information creates challenges for the library community at its very foundation, moving it away from the traditional paper-and-print format to an ethereal world of circuits and connectivity. The library is no longer defined simply as a building or a physical repository that houses information (Gurjeet Kaur 29). According to the Horizon Project's report, academic libraries will continue to be impacted by changing technologies and related standards, including electronic publishing, mobile apps, bibliometrics and citation technologies, open content, the Internet of things and the semantic web and linked data (Johnson, L., Adams Becker, S., Estrada, V., and Freeman, A. 32). Another research shows that user expectations are high and users would embrace wider use of technology at libraries such as online research services allowing patrons to pose questions and get answers from librarians, apps-based access to library materials and programs, GPS navigation apps to help patrons locate material inside library buildings, and kiosks located throughout the community where people can check out books, movies or music without having to go to the library itself (Zickuhr, K., Rainie, L. and Purcell, K. 3).

The digital technology has revolutionized resources of the library and is the reason for the emergence of information sources in multidimensional formats. “The new procedures that made sense for managing collections only thirty years ago have been turned topsy-turvy by changes in higher education and publishing, by the emergence of the new digital information system, and by a weak library economy” (Branin, J.J., Groen, F.K., and Thorin, S.E. 11). Stephen S. Crandall and Toni P. Olshan mentioned in their work that “The web has altered the process of acquisitions and collection development. The trend of delivering access to electronic resources impacts the relationship between libraries and publishers. Creation of library consortia has been a response to these changes so libraries can insure more favorable pricing than they could on their own” (217).

Today, another wave of library space design is in process. Many in the field of higher education refer to this design phase as one that is focused on creating library learning spaces. A top priority for these library learning spaces is to connect students to technology, information, and co-curricular learning — learning that deliberately complements the formal classroom activities, programs, and experiences that contribute to student learning. Ultimately, the emphasis is on holistic learning that may occur both inside and outside of the classroom. Versatility is essential to the planning and design of library learning space. (Alison J9).

## **3. Objectives of this Study**

The primary objective of this study is to analyze the influence of the technological advancements on traditional library services. This paper focuses on what areas are leveraged heavily by the technology, what kind of transformations have been taken place so far, what is the duty of the library professionals to deliver high quality services by using the latest technologies and what steps are required to stay relevant in the information technology age.

The first part of the paper elucidates the problematic areas where the library has great setback in its operations. In the second part, attempts have been meticulously made to explain the

strategies to overcome the identified problems and to apply the new technology in library services.

#### **4. Impact of Technological Development on the Traditional Services of Library**

Procurement of books, subscription to journals and e-resources were the routine functions of the library to fulfill the information request of the parent institution. Furthermore, they acted as storehouse of such information resources for the present and future needs. Facilitating the users to use these resources is another task of the library. Creating catalogues for the information resources available in the library as well as arranging them logically by using the standard classification system were the main job of the library. It has extended to another level. "Libraries play different roles for different people. To some, a library is a place to read books; be furnished with the current news from up-to-date newspapers; to do research; a place to access or share information in response to a particular need; etc. Nowadays, libraries and librarians play an important role in providing access to information, organizing it, and helping users to find the information they need" (Mayega 1). Advent of ICT has redefined the perception of library services. Before, the term library service was meant for library induction, circulation of books and reference services mainly. In the digital environment, it covers broader area as well as has new sense. Providing access to online resources both inside and outside the campus, creating more interactive library website, using mobile technology, and also redefining the library space for different purposes are coming under the library services. The conventional roles of the library are in a state of transition and require more attention to make them suitable for the ever changing environment. Technology has given new impetus to circulation service, reference service and library induction. The following section details how the primary operational areas of the library have been affected by the influence of technology:

##### **4.1. Collection Development**

Digital technology has made profound impact on the acquisition process. Digital information has begun to dominate in the field of scholarly publication. Responding to this emerging trend is the responsibility of the library. Multidimensional formats of resources and plethora of open resources play key roles. Users' thoughts have shifted towards instant results and information. All these factors are deeply leveraging in developing the library collection as never before. Ever increasing subscription costs as well as continuous budget cut are severely affecting the acquisition process. As a result of these, the library is unable to enrich its collection constantly. Another new problem is that library space should be remodeled to suit diverse nature of collections in which handling e-resources is one of the areas. Ultimately it causes serious repercussions in the library services. The collection development has got high priority. If the library collection is not up to the expectation of the parent institution and users' demands, the library cannot serve well which will subsequently make worse the services of library.

##### **4.2 Information Seeking Behaviour**

Present day users are digital users. Their behavior is governed totally by technology. Their search does not include only print resources but also covers open source e-journals, e-books, digital repositories and most importantly search engines. In addition, it contains social media, scientific blogs and forums. Strategically these parameters should be reflected in the library services to reach the users to serve in a better way. The users heavily rely on the Internet for

their information requirement whether it is for academic purpose or for personal use. Perception of the users about library has not changed much. Besides information seeking behavior varies from person to person, based on needs and their skill. It cannot be generalized, but the library must cater to the need of all kind of users. In library, information search is still a tiresome process as each resource adopts different type of searching mechanism and it eventually confuses the users. “Web search engines and Google in particular have created a generation of searchers who are choosing the simplicity of search engines on the open free web over the perceived complexity of library services (Jan Brophy and David Bawden 498).

### **4.3 Information Literacy**

Though the library orientation is century old phenomena, technology has renovated the library orientation beyond the recognition. Proliferation of information resources in all formats necessitates overall modification. The value of the resources available in the library should reach users to maximize their usage. The patrons should acquire information literacy skills to accomplish this task. Equitable access to all resources is prerequisite one to succeed in their academic endeavor. Creating awareness about the resources available in the library and train the users to use different nature of resources particularly online resources will be the solution for this problem. Another problem in this area is lack of proficiency among library professionals to conduct the information literacy programs. ICT makes it attainable. The librarians should initially empower themselves to train the users proficiently. Aggressive marketing is inevitable one and will pave the way to get good returns for the huge investment on the resources. The library should include these activities in their action plans. The term information literacy has emerged as new and delivers the same in a highly sophisticated manner.

“In the present time, the problem is not the lack of information but the main problem is significant use of the available information and information sources. In approximately cases users find difficulties to determine the right information due to lack of search skills. The information literacy (IL) plays the significant role in proper utilization of information, developing search skill and inception of knowledge (Meetu Gupta and Rakesh Pant, 267)”.

### **4.4 Library Space**

The patrons want to use the library for variety of purposes. Their approach moves along with their needs in using the library. As the patrons visit the library not only to borrow books but also for other curricular and co-curricular activities, the space saving of the library is not feasible. Indeed, the library is committed to have more functional areas than before. In the academic environment, the students want to discuss, study seriously without any disturbance, conduct meetings, perform research work and access e-resources through electronic gadgets. It compels that the library building must be multifunctional to suit these needs and also to maximize the usage of the library. Rooms for group discussions, sound-proof rooms for serious study and also break-out areas with soft furnishings and couches have become mandatory for the academic library in the digital era. Redesigning library space is a rejuvenating process to restore its old stature. Integrating these changing needs with library space is unavoidable at this juncture to remain relevant to the evolving needs.



## 5. Strategies to Use the Technologies to Overcome the above Identified Issues

### 5.1 Revamping the Collection Development Process

The library services are affected by various factors in which the resource development is major one. This paper is basically paying attention on issues related to the services of the library, not on overall resource procurement matters. At the same time, it is impossible to update the library services by keeping conventional policies in building the library resources. The exponential growth of electronic resources, escalating cost of both print and digital scholarly journals, and constraints in the library budget extremely impinge on core functionalities of the library. The library collection development policy must be revised and include both print and digital resources, formation of library consortium and effective use of open sources. Inclusion of resources in all formats in the library is basic necessity. Perceptions of users are composite regarding the library resources. They have to be tackled successfully to stay relevant in the Internet era. The customary way of purchasing print books and subscription to print journals is not sufficient to meet the demand of the users, but adding e-resources is the way to overcome this obstacle. Many factors are to be considered to develop digital collection because of their complexity nature. Though the contents of e-resources are pertinent to curriculum of parent institutions, other aspects such as currency, licensing agreement, access permission, reliability, functionality, ownership, compatibility, authentication, technical support from vendors, training, purchase models, pricing and other related matters should be contemplated while selecting e-resources. Consultation with academic departments to confirm relevancy and IT department to deal with technical matters are essential before taking final decision.

Library consortium is another developmental pattern to bolster the library services. This collaborative approach makes the library to overcome budget limitations, permits the users to access broader range of resources and fulfills information necessities of the users. As ICT simplifies the job of forming consortium, it is a right approach to help our patrons to provide more resources at reduced price. Identical type of institutions can form the library consortium. It will ease the process of identifying the resources that are having high demand among the participating institutions. There are different types of business models such as perpetual access; pay-per-view and outright purchase to subscribe to e-resources. These models ease the process of selecting the e-resources based on their best offer. A dedicated website can be developed exclusively for the consortium to provide secure access on a single platform to member libraries where other features like discussion forum, chat facilities, tag etc. can be made to discuss on issues of common interest and also to help the users. Consortium model is growing fast globally. United States has the highest number of academic consortia according to the International Consortium of Libraries Consortia (ICOLC). One of the leading academic library consortia projects is Ohio Link; The consortium of Ohio University libraries which emerged in 1987. Council of Australian University Librarians is an Academic and Special Libraries Consortium for 70 universities and institutions in Australia and New Zealand. In Europe, The New European Library, a research portal is multi-countries consortia provides access to resources for researchers in many subjects (Laila Samea, 132-133). In India, Ministry of Human Resource Development (MHRD) has formed e-ShodhSindhu merging three consortia initiatives, namely UGC-INFONET Digital Library Consortium, NLIST and INDEST-AICTE Consortium. The e-ShodhSindhu will continue to provide current as well as archival access to more than 15,000 core and peer-reviewed journals and a number of bibliographic, citation and factual databases in multiple disciplines from a large number of publishers and aggregators to its member institutions including centrally-funded technical

institutions, universities and colleges (inlibnet.ac.in). Ultimately technology opens many doors to enhance the quality of the library services.

As providing required information is the top-level responsibility of the library, the library must equip itself to fulfill its objective. Exploring the possibilities of using open resources in this contemporary world is one of the ways. "Main motivations behind open access (OA) initiatives were: high subscriptions rates, which were difficult to afford, and the large price discrepancy between individual and institutional subscription rates. Consequently libraries ended up paying huge subscriptions for journals and they were becoming more restrictive. OA provides free, immediate, permanent online access to the full text of research articles for anyone, web-wide. Open access provides several benefits to researchers, educators, journals, publishers, funding agencies, government and academic institutions around the world. It is an effective vehicle to information exchange between all countries. The total number of open access journals continues to rise" (Priti Jain<sup>3</sup>). Currently, large number of open access e-books and e-journals are available in almost all fields of knowledge. Several well renowned organizations are pioneering open source movements to remove hurdles in accessing scholarly information and also to solve the ever increasing subscription cost to some extent. The library may well use open source e-books and e-journals relevant to their curriculum, and should inculcate this culture among its users. Only peer reviewed and good impact factor open access e-journals are to be made available on the library website. Similarly, large numbers of free high quality e-book websites can be found on the Internet. The library professionals with the help of faculty must identify pertinent open source e-books websites and have to give proper link on the library website for easy access. Maintaining high academic standard in selecting open sources is one of the criteria. A separate section on the library website can be created exclusively for open source e-journals and e-books. In addition, metadata of open sources can be harvested and stored in the institutional repositories for easy and anytime access. Useful e-books can also be downloaded to store in the institutional repositories after checking their copyright rules. Most of open educational resources permit to use them for academic purpose without any restrictions. This sort of actions will help library to sustain and will make more functional.

## **5.2. Information Seeking Behaviour and Role of Information Literacy (IL)**

Consistent growth of e-resources poses a threat to information searching process. Astounding developments in the field of ICT assist library professionals to resolve this snag. Researchers in information searching field strive hard to provide better solution to the problem. At present, powerful single search discovery tools are available to search simultaneously OPAC, digital library, e-resources subscribed by the library and open sources. They are user-friendly, faster, having multiple features to narrow down or expand the search and able to display results with relevance ranking. Here, the patrons need not know which database or resource they have to search first. It streamlines the information searching process, makes all resources discoverable and improves visibility. Summon by ProQuest, EBSCO Discovery Service, OCLC WorldCat, Ex Libris's Primo Central, LibraryFind, VuFind and Scriblio are some important discovery tools which have been developed to overcome these sorts of hurdles. Using anyone of this kind of discovery tools will be the solution for this problem and will also augment the information searching process.

Providing training to the users is the next step to use these discovery tools competently in order to get the needed information. Delivering full-fledged IL programs in the library can solve many complications in information seeking behavior. IL becomes an essential service

to equip the library patrons to accomplish this task. ICT redefines the concept of conducting the library orientation. IL programme is imperative to optimize the utilization of the library and will empower the users to use all type of resources. The cutting-edge computer technology simplifies the job of creating online IL tutorials with multimedia capability. It permits the library professionals to evaluate the tutorials and to track the usage as well. The users' need differs based on their level and study. Different level of skill is required as well. IL modules encompassing various types of information resources, search strategies, evaluating the retrieved information, using the information ethically and effectively, and citation methods can cater to the need. How to frame queries, how to use various options such as advanced level option, keyword option; and how to search print, digital sources and open sources on the Internet are to be part of search strategies in IL modules. Ethical part may have copyright infringement issues and how to avoid plagiarism. Most importantly IL programs have to be designed to meet specific needs for courses offered in the particular academic institution and should be customizable. IL programs must comprise modules with these elements to provide in-depth training to all level of students including research scholars to make everyone information literate and life-long learners. The library professionals must accustom well with all modules to deliver IL program in a befitting manner.

### **5.3. Services through Library Website**

The library website is very much connected to modern services of the library. It ensures omnipresence of the library among its users. Variety of the services can be offered through the library website including access permission to its e-resources. It is gateway of the modern library. OPAC on the library website with sophisticated search features will help patrons to find the library collections wherever they are. Traditional current awareness service, conveniently could be called as Alert Service can be offered to the patrons to know the latest additions in the library. This service can be fine-tuned to send emails automatically to the patrons whenever new items are added in their field of study. Traditional current awareness service has got new facelift. As search is a primary action on the library website, it has to be prominent on the homepage of the library website. Single search box on the homepage will pave the way to search all simultaneously. Advance search feature must be simple with proper description. Save option on the user account will enable the users to refer the same in future. In addition subject guides, suggestion boxes, chat facility, forum, course guides, citation sources, information literacy tutorials, digital repositories, list of new arrivals, latest information, inter-library loan facility, useful links, study room reservations and discussion forum etc. can be provided through the library website. The users can be allowed to rate, tag and comment on the library collections which will benefit other users. 'Ask Librarian' service is an effective way of offering conventional reference service. Reference service has become a virtual service. Reference librarians could be contacted anytime without any geological barrier and can answer instantaneously. It will transform the way of functioning and will help to establish relationships among patrons.

Above all, library website has to be user friendly. Homepage must be impressive and not be cluttered. While giving essential information on the website to the patrons using plain language will avoid confusion. Periodically, conducting website usability test is a good strategy to enhance its utilization. The usage of mobile devices is snowballing. Developing mobile optimized library website is vital to respond the users' needs. The library website expands horizon of the library, allows playing different roles and helps the library to be more interactive.

#### **5.4 Accessibility**

Developing library collection is one of the fundamental duties of the library and making them available to everyone is also equally important. Easy reach and better accessibility are need of the hour. Providing access facility in different platforms such as, intranet portal, library website and mobile apps is absolutely feasible. Electronic gadgets for example desktop, laptop, notebook, i-pad, tablet and smartphone can be used to access the library resources through these platforms. It is an upcoming trend and will enable patrons to access the library resources from any remote places at any time effortlessly. This will holistically support teaching and learning process. ICT has created avenues to access them in multiple ways. Developing mobile apps is feasible in the current circumstance and will increase the accessibility. All these can bridge the gap between library and end-users in utilizing the e-resources. Additionally, mobile app will facilitate the users to avail all online library services. The library can equip itself to provide access to all its resources by using ICT.

#### **5.5 Library Space**

Creating user-centered spaces inside the library has become a part of library service as it serves the users in numerous ways. The library professionals should contemplate developing versatile areas to address the needs of wide range of users for their different type of learning inside the library. Increasing reliance on digital resources is main reason to reshape the library space. Creating conducive environment for the users is also library service. The perception of conducive environment has drastically changed in the modern days. Going beyond the old-fashioned reading room is indispensable one to be productive in the academic environment. Changes in pedagogy create new opportunities to the library to play dynamic role in the academic environment. The library can be an integral part of colleges and universities in strengthening students' information skills, reading skill, writing skills and communication skills. The overall services have shifted from traditional way of functioning to user-centric way of functioning. Room for collaborative study is a new demand where the users can discuss and present their works. Likewise, quiet study area is another requirement for individual study. The study carrels with shelves, power sockets and wireless Internet access facilities will suit this kind of need and can isolate the users. Lounge furniture for reading newspaper and other leisure reading will also attract the users. Wi-Fi facility to use laptops and electronic gadgets, Computers with Internet connection and necessary software, printer facilities, projectors for presentation and video conferencing are inevitable in the contemporary academic library. These facilities will endow the library to take part in teaching and learning, and will convert as an intellectual learning resource center.

#### **6. Conclusion**

This study elaborates some major operations of the library and how they have been affected by the rapid advancement of technology. Furthermore, it pinpoints the way to utilize the technology in delivering the library services to overcome the identified problems and also to perform up to the expectation of the modern users. Besides new paradigm shift in some major functional areas of the library such as library induction and web-based services have been deliberated in detail. It has also been described that how the digital information has revived library collection and indirectly plays a crucial role in reshaping the library services. Renovation of library building to make use of the library space for teaching and learning is another innovative and needed strategy which was not part of the library responsibility before. This study has revealed the fact that continual growth in ICT will create new

challenges, and the library should be in a position to confront these challenges to play a prominent role in accomplishing mission of its parent institution and also to satisfy the users' information demand persistently.

## 7. References

1. Gurjeet Kaur (2015). The Future and Changing Roles of Academic Libraries in the Digital Age, *Indian Journal of Information Sources and Services*, ISSN: 2231-6094, 5(1), pp. 29-33.
2. Johnson, L., Adams Becker, S., Estrada, V., and Freeman, A (2014). *NMC Horizon Report: 2014 Library Edition*. Austin, Texas: The New Media Consortium, (<http://cdn.nmc.org/media/2014-nmc-horizon-report-library-EN.pdf> retrieved January 02, 2018 ).
3. Zickuhr, K., Rainie, L. and Purcell, K. (2013). *Library Services in the Digital Age*. (<http://libraries.pewinternet.org/2013/01/22/Library-services> retrieved February 10, 2014).
4. Branin, J.J., Groen, F.K., and Thorin, S.E. (2000). The Changing Nature of Collection Management in Research Libraries, *Library Resources & Technical Services*, 44(1), pp. 1-17.
5. Crandall, Stephen S. and Olshan, T.P. (2002). *Acquisitions and Collection Development in Business Libraries*. In: Karp, R. S. (ed.) *The Basic Business Library: Core Resources*. 4th Ed. Westport, CT: Greenwood Press. pp. 217-230.
6. Alison J (2016), *Planning and Designing Academic Library Learning Space: Expert Perspectives of Architects, Librarians and Library Consultants*. Santa Rosa, CA: Project Information Literacy: Practitioner Series research report (Retrieved from [http://www.projectinfolit.org/uploads/2/7/5/4/27541717/pil\\_libspace\\_report\\_12\\_6\\_16.pdf](http://www.projectinfolit.org/uploads/2/7/5/4/27541717/pil_libspace_report_12_6_16.pdf) on 24-Jan-2018)
7. Mayega, Stephen (2008). *Library Information Services in the Digital Age*. Fourth Shanghai International Library Forum (SILF 2008), Shanghai (China). (Retrieved from <http://eprints.rclis.org/12567/> on 16-Jan-2018) pp. 1-8.
8. Jan Brophy and David Bawden (2005). Is Google enough? Comparison of an internet search engine with academic library resources, *Aslib Proceedings: New Information Perspectives*, 57 (6), pp. 498-512.
9. Meetu Gupta and Rakesh Pant (2017). Influence of Information Literacy on Students of G.B. Pant University of Agriculture and Technology, *International Journal of Research –Granthaalayah*, 5 (2), pp.266-278.
10. Priti Jain (2012), *Promoting Open Access to Research in Academic Libraries, Library Philosophy and Practice*, (Retrieved from <http://digitalcommons.unl.edu/libphilprac/737> on 11-Jan-2018)
11. Laila Samea (2015). Academic library consortia in Arab countries: An investigating study of origins, development, and services, *International Journal of Library and Information Science*, 7(7), pp.130-147.
12. e-Shodhsindh consortium portal <https://www.inflibnet.ac.in/ess/about.php>, retrieved on 30th Jan 2018.

