1.0 Introduction

We are living in an ‘Information Society’. The present information society is characterized by ever-growing significance of information. The information society has generated the problem of information explosion; it is the result of increased Research & Development activities, improvement of science and technology in the various fields. The information explosion has produced massive information in various complex forms and formats. The multidimensional and varied form of information can be handled and managed by Information and Communication Technology (ICT); it is also the backbone of information society. It has become very difficult to manage the information manually due to explosive growth of information and knowledge. The knowledge almost in all subject fields is increasing tremendously in a multidimensional way. There is need for proper organization and management of information and knowledge. Thus ICT has been emerged for effective and efficient knowledge organization and its retrieval. ICT is the biggest achievement in the evolution of 21st century. With the development of ICT, the world has changed into a “Global Village”. Information and communication technology involves essentially with the storage and communication of information. The greatest potentiality of ICT, thus, is its ability to serve as a tool to circulate information and to induce a qualitative change in the human society. Developments in information and Communication Technologies have made significant impact on all spheres of human society. Now information can not only be stored, retrieved, communicated and broadcasted electronically in enormous quantities and phenomenal speed, but can also be rearranged, selected and transformed. The impact has been well-known in case of service and activities in libraries and information centers also.
The world is undergoing a transition from traditional paper media to a modern digital media. It is essential for libraries in countries in the developing world to take part in this changing scene. Today libraries are shifting their role from the custodian of traditional information resources to the provider of service-oriented digital information resources. Developing countries are being encouraged to invest in their national information infrastructure so that they can participate in knowledge-based development. Advances have brought many changes in libraries. Information and communication technology (ICT) has provided libraries with new opportunities to improve their resources and services. The services rendered with the help of ICT are faster and more effective. Moreover, it creates faith and confidence about the products and services of an organization among its users. Widespread use of computers, storage media has increased reliance on computer networks, rapid growth of the Internet and explosion in the quality and quantity of information compelled libraries to adopt new means and methods for the storage, retrieval and dissemination of information. Information needs and diverse information tools have affected our daily life as well as research and developmental activities. Latest devices for information communication have resulted in the expeditious dissemination of information and revolutionized the information handling activities in research and academic libraries in India.

The former president Dr. Kalam has stressed that India would have to be a knowledge society in 21st century and he imagined ‘the Mission 2020’. It is well-known that R&D activities play a significant role in the development of a nation. The R&D and higher education related activities can’t easily carried with the help of modern ICT based Library and Information Centers. Thus Information and Communication Technology is the necessity of Libraries and Information centers in present modern time.
Academic libraries, mostly attached to universities and research institutions as centers of information services, have largely benefited by the rapid changes in technology. The advancement of digital computer technology, telecommunication technology, widespread use of networking, explosive growth of internet world wide packet networks, optical discs and other mass storage media, interactive video technology, image technology, computer graphic technology, virtual reality and the growth of public and private database have opened up new possibilities in dealing with the collection, organization and dissemination of information.

ICT in any system, designed together process, or distributes information or it is the science and skill of all aspects of computing, data storage, and communication. ICT may be any combination of tools and procedures that facilitate the generation, acquisition, storage, organization, retrieval, searching, viewing, updating and transmission of information using electronic means. The tools used in ICT include purpose-built computer programs, databases, communication networks, analysis and design methods, programming languages, artificial intelligence, robotics, knowledge bases, etc. ICT has long standing influence in almost all areas of libraries and information centers. The modernization of libraries and information centers enabled information transfer and access, there by establishes a network of libraries and information centers. This initiative helped in resource development, resource sharing and their utilization at various levels. Information professionals subscribe to e-journals, CD- ROM databases, online databases, web-based resources, and a variety of other electronic resources. They participate in library consortia and build digital libraries. However, these libraries have been hampered by many constraints to embark on successful application of information and communication technology (ICT) for their operations, resources, and services (Williams & Channaveeraiah, 2008).
According to the five law of library science ‘books are for use’ and ‘every reader his/her book, ‘every book its reader’ so ICT provides multi-simultaneous way of document access, ‘save the time of user and staff’ the time factor is highly satisfied through ICT implementation, and ‘Library is a growing organization’ so definitely the ICT handle, manage and organized the library services, resources and activities in a effective and efficient manner. Thus the ICT application is suitable for fulfillment of five fundamental law of library science.

ICT has changed the traditional methods of library activities and services providing new dimensions for teaching, learning and research in higher educational institutions. It is important to assess the ICT applications in academic library and information centers in the context of changing user needs. The growth of application of ICT in number of areas coupled with its success prompted many academic libraries to adopt ICT and use it for various library operations and services. Initially, the computer applications were limited to data storage and retrieval only. With the advancements in ICT, the academic libraries are gearing up to make use of these technologies to provide the information quickly. The application of ICT in academic libraries are indispensable and is being adopted in the libraries for collection development, classification and cataloguing, circulation, storage and retrieval, reference work, dissemination, administration, preservation, conservation and archiving. The academic libraries are in the forefront to embrace ICT for their library activities and for providing services to their user community. The college libraries are also gradually adopting the ICT realizing the potential benefits to the user community in the category of academic libraries. The present study is focused on ‘Impact of Information Communication Technology on the Library Services of Degree Colleges affiliated to Delhi University: an Analytical study.’
1.1: Meaning and Definition of ICT

ICT Stands for "Information and Communication Technologies." ICT refers to technologies that provide access to information through telecommunications. It is similar to Information Technology (IT), but focuses primarily on communication technologies. This includes the Internet, wireless networks, cell phones, and other communication mediums. (http://www.techterms.com/)

The term ‘Information and Communication Technology’ (ICT) first appeared in the mid 1980s and was defined as "All kinds of electronic systems used for broadcasting telecommunications and mediated communications", with examples including personal computers, video games, cell phones, internet and electronic payment systems and computer S/W etc. The ICT is made of computer and communication technology. The computer technology is the tool for storing and processing information in digital form while communication technology helps us to transfer and disseminate digital information. Additionally ICT means a variety of technological applications in the process and communication of information. The word ICT is a combination of two words information, communication & technology. Information means knowledge and technology means use of computer & communication. The term ICT can be defined by Riyasat & Fatima, 2008 as “the integration of computing, networking and information processing technologies and their applications.” (http://www.academia.edu) Thus, ICT means a combination of computer applications’ and communication technology for gathering, processing, storing and disseminating of information.

Information Communication Technology is a generic term used to denote various activities connected with acquisition, storage, transmission, retrieval and processing of information. Simply speaking, ICT is all about the management, movement and
sharing of information through applications, computer systems, storage, communication technology and networks. The constituents of ICT are computer systems and telecommunication systems, which together made it possible to provide information more exhaustively than before. (http://www.tscermumbai.in)

**Definition of ICT**

There are various definitions for ICT and a few that are relevant to this study are described here.

ICTs “refer to technologies people use to share, distribute, gather information and to communicate, through computers and computer networks” (*ESCAP*, 2001).

“ICTs are a complex and varied set of goods, applications and services used for producing, distributing, processing, transforming information – including telecoms, TV and radio broadcasting, hardware and software, computer services and electronic media” (*Marcelle*, 2000).

*Ebijuwa* (2005) defined ICT as tools used for collection, processing, storage, transmission, and dissemination of information. With advances in ICT, electronic information resources such as electronic books, electronic journals, CD-ROM databases, OPAC, Online databases and the Internet have launched the world into an information age. No institution or organization can still rely on only traditional printed information resource to perform effectively and efficiently. To librarians, ICT is a significant development that provides tools for managing the avalanche of information generated by modern society. ICTs represent a cluster of associated technologies defined by their functional usage in information access and communication, of which one embodiment is the Internet.

In the UNESCO training module for ICT, Information Communications Technologies (ICT) are described as the technologies that enable society to create, collect,
consolidate, communicate, manage and process information in multimedia and various digital formats for different purposes, i.e., computing and telecommunications technologies like the personal computer, CD-ROM, cable TV, cellular phones and the Internet (David, 2001).

Hargittai (1999) explained that Information communication technologies can be split into three components: the technology part; information that the technology helps deliver; and a communication process that the technology facilitates and serves as a medium for the information.

Hamelink (1997) classifies ICT according to five different functionalities-capturing technologies (like input devices), storage technologies (magnetic tapes and disks), processing technologies (systems and application software), communication technologies and display technologies (e.g. output devices for display of digitized information).

ICTs, represented by the Internet, deliver “at once a world-wide broadcasting capability, a mechanism for information dissemination, a medium for interaction between individuals and a marketplace for goods and services” (Kiiski and Pohjola, 2001).

Information and communication technology, or ICT, is defined as the combination of information technology with other, related technologies, specifically communication technology (http://www.tscermumbai.in).

Pradhan defines ‘Information and Communication Technology (ICT)is a comprehensive concept and parallel concept with information technology(IT), that denotes not only a single unit of technology but an assembles of technologies, like telecommunication equipments, data processing equipments, semi-conductors, consumer electronics etc. The concept has brought a phenomenal change in the information collection, preservation and dissemination scene of the world. For the
profession of librarianship this turn of the events is a blessing in disguise.’ (Pradhan, M.R. 2004)

UNESCO defines the Information and Communication Technology, or ICT, as the combination of informatics technology with other, related technologies, specifically communication technology.

UNESCO defines informatics as the science dealing with the design, realization, evaluation, use and maintenance of information processing systems, including hardware, software, organizational and human aspects, and the industrial, commercial, governmental and political implications of these.

Informatics technology is defined as the technological applications (artifacts) of informatics in society (http://unesdoc.unesco.org).

1.2 Academic Libraries

Academic libraries are related with academic purpose and established in academic institutions to support teaching, learning and research activities of students, teachers and research scholars. The real worth and potential of a library is realized when the students feel compelled to be driven from the classroom to the library to satisfied their curiosity that is created in the classroom. Wolpert (1999), "academic libraries are cost effective information service and provider of knowledge products to a resident community of scholars". ICT has influenced the every area of academic library. ICT presents an opportunity to provide value-added information services and access to a wide variety of digital based information resources to their users.

The academic libraries include libraries in school, college and university libraries. All these cater to the needs of the academic community for supplementing the study and research programmes of the institutions and help to preserve and disseminate the information and knowledge.
Academic libraries have already transformed their specific functions by utilizing effectively innovative information communication technologies to enhance and integrate their specific information resources and services. Eventually, library and information professionals in academic libraries need to update their knowledge and skills in information and communication technology as they play the role of key success factor in enabling the library to perform its role as an information support system for society. Thus ICT implementation and professional skill is the current requirement in academic library in present scenario.

1.3 College Libraries

College libraries are not exempted from the impact of ICT. The college libraries are very much interested in incorporating the latest ICT in their technical works, daily routines, user services and administrative functions. The objective of a college library is to supplement the instructions imparted in the classroom. It aims to function as an independent teaching agency, encouraging and promoting the use of documents in the ways beyond those suggested or required by the classroom teaching. The college library functions basically to assist and support the study, learning and teaching in the respective college. It helps to meet the learning and reading requirements of the students as well as the teachers and researchers of the college. College libraries in India have a significant role to play in higher education. The majority of the UG students, i.e., 88.5% and graduate students, i.e., 53%, attend these colleges. (Kipp, and Kipp, 1961). Majority of the college libraries do not have proper facilities to meet the user’s information needs. Their collections are not up-to-date, inadequate budget, and a mostly in them are single libraries. (Deshpande, 1978). After the Indian independency many among the 533 affiliated colleges did not have their own libraries, but at present, every college has a library (Sharma, 1986). The study of working hours of library by Deshpande, reveals that the college libraries are open
only six to eight hours a day. Many do not have any qualified librarian on their staff and have closed access only. (Deshpande, 1978).

The several commissions and committees, like the Radhakrishnan Commission of 1948, did not give stress on the importance of the college libraries in their reports. However, the U.G.C. gives more importance to the college libraries. As the quality of higher education and research, especially at the graduate level, depends upon, among other things, the standard of the college libraries and their services. Therefore, the UGC has played a significant role in the growth and development of college libraries since 1953 by giving grants for books, equipment, staff and infrastructure of library and has done a remarkable job in salary improvement of the college librarians. The UGC’s contribution to the college libraries is at the rate of Rs. 15 per student with a maximum of Rs. 10,000 with some additional and special grants for text books, when a new subject is introduced in the Curriculum (Vyas, 1974). On the other hand, the colleges and the state governments have failed to provide their equal share. The total Expenditure on the college libraries according to the recommendation of the Education Commission should be 6.25 % of the total budgets of the colleges, but in most cases it has remained between 1.5 % and 2.3 % (Sardana, 1966). Collection development of the college libraries are done without taking into consideration the real requirements of the faculty and the students of the colleges as 60 % of them consist of text books and 20 % cover fiction (Reddy, 1974). Even this small inadequate collection, in depth and content, is not used effectively due to the closed stacks system and lack of staff and facilities for instruction concerning their use. The net result is that the utility factor of the college libraries comes practically to nothing (Trehan, 1974). In most college libraries, books are neither properly classified nor catalogued. In several libraries no systematic classification is followed for arrangement of collections. The only service the college library renders to its users is
book-lending. There are colleges where students are not even allowed inside the library, only books are issued to them. (Bavakutty, 1982). The UGC is aware of the slow progress of the college libraries. In addition to providing financial help for development, it has also from time to time organized seminars to keep the college librarians aware of the recent developments in the field. But these seminars have made only a limited effect on the progress of the college libraries. The condition of the college libraries in the country should be a cause for alarm among the academic community. In the interests of the development of higher education in the country along proper lines, it is important to make a detailed study of the style of functioning of the college libraries and of the utilization of the library resources and facilities by the students and teachers. This will help in the preparation of more realistic and operational policies and programmes for ensuring the proper functioning, utilization and development of the college libraries. The college library has to be made the intellectual hub of the institution, serving equally, both the students and teachers. This is all the more necessary because about 90 % of the students in higher education in India pursue their studies in colleges and they have only very small and substandard college library resources to fall back upon. Although, owing to various efforts of the UGC as well as other forces, the traditional concept that the college library is a custodian of books has changed, yet there is evidence enough to show that the condition of the college libraries is generally poor, their development is rather slow and that the position of the college libraries and their librarians in India, with a few exceptions, is pitiable. India has set up the Information and Library Network (INFLIBNET) under the UGC as the inter-university agency on library modernization to take the initiative and address the issues required to implement the perspective plan for the academic sector. Each university and its affiliated college libraries also should be part of the overall scheme of development (Verma, 2005). INFLIBNET is actively
involved in the automation and digitization of university and college libraries. The encouragement and cooperation given by the INFLIBNET by its various activities like automation, funding, training, orientation, workshops and publications really made the university libraries equipped with all ICT tools for providing better services to the users.

1.31: Functions of college Libraries- The college libraries has to cater the following functions-

1. To provide information resources, necessary for teaching and research.
2. Aiding the teachers in keeping abreast of current information for all academic programmes.
3. Opening the door of the wide world of knowledge, that lie beyond the borders of teachers own field of specialization and.
4. Bringing information, students and teachers together under condition which encourage for pleasure self discovery, personal growth and sharpening of intellectual curiosity. (Nair,1996)

1.32: Objectives of college Libraries- The objectives of a college library are as follows:

1. It helps in all educational and instructional programmes of the college;
2. It develops a habit of deep and advanced studies of subjects beyond the text books of subjects, in students;
3. It enhances the understanding of different subjects or disciplines among students;
4. It prepares the students as an intelligent, aware, informative and enlightened person to play the role of a responsible citizen;
5. It assists the research work and lays down the initiative base for research work in students;
6. It informs the teachers with latest up-dates in their respective subject area;

7. It provides healthy entertainment material to its users. (www.kuk.ac.in)

1.4 Need of Information Communication Technology in College Libraries

The college libraries are established to support learning, teaching and research activities. These libraries have been affected by the changes in information Communication technology (ICT). The rate of changes coupled with advancement in the field of ICT is still growing at a speed pace. The trends in ICT have led to change in the way the college libraries work, reorganization in their systems and procedures, requirement for new set of skills, etc. The technological advancements in the libraries such as from CD-ROMs to Blu-Ray discs, electronic databases, online services and the way the Internet has come up have radically transformed access to information. Information technology has become an essential tool to modernize the services in the college libraries. The benefits of IT applications are many, but in the libraries it is used for the processes of information processing, storage, retrieval and dissemination. The IT has given the college libraries an opportunity to provide value-added services and access to wide range of electronic information resources to their users.

Information Technology has impacted every sphere of college library activity in the form of collection development, library building, and library networks. The college libraries are using IT to automate their core functions such as catalogues, circulation, etc., implement management information systems, developing digital collections and digital libraries, implement efficient and effective library networks and re-engineering for IT- based capacity building programmes for library professionals and the users as well. The emergence of the Internet has also changed the role of the college libraries in the way they facilitate the information resources and services to the end users in the digital environment and also paved the way for new and innovative web based
electronic information resources and services. The need of information communication technology in libraries arises due to the following reasons.

1. Information and knowledge Explosion.

2. Failure of manual systems and methods to cope up the increasing demand for efficient and effective services.

3. The ability of the technology to process huge amounts of information with great speed and accuracy.

4. Change in the mode of services i.e. from collection based services to information based services.

5. Availability of information resources in diverse electronic form and format.

6. Inadequate physical infrastructure for storing the documents and equipments.


8. Increasing awareness and complexity of demand of users for information.

9. Rapid technological developments and increasing affordability of technology.

10. Inadequate physical infrastructure for storing the documents and equipment.

11. The ability of the technology to make information accessible to users on various networks and to remote places.

12. To save or generate money.

**1.5: Benefits of ICT Implementation for College Library Services**

Developments in ICT have made significant impact on all spheres of libraries. The impact of ICT has been affecting the structure of the services of college libraries to a great extent. The information and Communication Technologies have brought many benefits of library and information systems and services. Benefits of use of ICT in services can be broadly explained in terms of 4 Es, namely economy, ease, extension (or expansion) and efficiency. The ICT implementation for providing library services is beneficial in the following ways:
1. It has ability to introduce for generation of new services
2. It achieves the efficiency, effectiveness quality and range in library services.
3. To facilitate easy and wider access to all kinds of information services, sources and products.
4. To provide remote access to users.
5. To provide access to unlimited information from different sources.
6. To provide information flexibility to be used by any individual according to his or her requirements
7. To facilitate the reformatting and combining of data from different sources
8. It saves the time, space, manpower and resources.
9. To facilitate faster information communications
10. It helps for controlling the tremendous escalation of information;
11. It assists to provide high quality of services and increases the range of services;
12. It has facilitated the ways of resource sharing by co-operation and co-ordination through library networks and library consortia.
13. To provide marketing opportunity of library services.
14. Accommodation of increased workload of professionals.
15. It helps for the improving of library image by providing better services in modern ways.
16. The problem of information explosion can be solved only by the application of ICT and network in libraries.
17. To help the library professionals to free from routine, repetitive and uninteresting jobs this can be done using computer and telecommunication technology.
18. To develop/upgrade the skills and abilities of library professionals.
1.6: Application of ICT in College Libraries

The application of computers in storage, retrieval and dissemination of information has brought new possibilities of automatic indexing and free text searching. Computerized acquisition helps processing purchase requests, receiving and accessioning documents, invoice processing and payment arrangement, order follow-up, online enquiries and preparation of reports, etc. In this process, computers enable libraries in making use of the same data available in different files without entering it again each time. Computerized catalogue is the most efficient tool in retrieving quickly. Computerized serial control helps in creating a database of journals, processing new subscriptions, renewal of subscriptions, order placing and invoice processing, receiving and recording issues, claiming missing issues, bindery management, maintenance of list of periodicals, serials holdings, etc. Circulation procedure in a conventional system is very lengthy and consumes much of the staff time in repetitive works. The use of technological devices such as computers, barcode scanners, smart cards, etc in circulation helps in performing routine operations easily and quickly. It saves lot of time for the staff as well as users. Computerized library can provide information quickly on various library management activities required by the management for budgetary control, preparation of account, maintenance of records, library statistics, etc. Once the computerization activities are well progressed, information retrieval and database management activities, including the Internet based information service can be strengthened. A wide variety of advantages can be derived by the appropriate use of ICT. There are several reasons for application of ICT in college libraries. The following are the important among them:

1. Explosive growth of information
2. Wastage of time in handling routine and repetitive library operations.
3. Advantages like speed, accuracy and reliability in the process of information handling.


5. Multi and simultaneous use of digital information.

6. Facility to access resources and services of a library without visiting the library

7. Saving the budget of library of information centre.

8. Facility to reduce the work load of library professionals.

9. Provision of an effective control over the entire library resources, services and operations, including all housekeeping activities.

10. Improvement of the existing resources and services as well as the introduction of new resources and services.

11. Facility to share the resources and services among various libraries and information centers through library networking and library consortia.

12. To avoid the duplication of resources and services.

1.7 Statement of the Problem

In view of the above facts and as the present situation demands, the problem selected for study is "Impact of Information Communication Technology on the Library Services of Degree Colleges affiliated to Delhi University: An analytical Study".

The problem involves a systematic study of the resources and services of the libraries of Degree Colleges affiliated to Delhi University and also the impact of ICT on the Library Services of these libraries. The need and expectations of the users, different services being provided by the libraries the impact of ICT on those services and the management in particular from the interesting aspect of the present research problem and ICT is hoped that this investigation would be rewarding from many angles.
1.8 Definition of Terms

Impact: Oxford Dictionary and Thesaurus (2001) defines impact as immediate effect or influence, or consequence. The Webster’s New World College Dictionary (2005) defines impact as the power of an event, idea, etc., to produce changes, move the feelings, etc. Collins Dictionary (1987) terms it as profound effect or collision.

Information Communication Technology: The World Bank defines ICTs as “the set of activities which facilitate by electronic means the processing, transmission and display of information” (Rodriguez and Wilson, 2000).
References:


11. http://www.kuk.ac.in


13. http://www.tscermumbai.in
