Chapter 2

LITERATURE REVIEW

2.0 Introduction

Developments in ICT have made significant impact on all spheres of human life. The impact has been rather prominent in case of service activities such as banking, health, transportation, education and libraries. Benefits of use of ICT in services can be broadly explained in terms of 4 Es, namely economy, ease, extension (or expansion) and efficiency.

For the Libraries, ICT’s has tremendously changed the Management of Resources or House Keeping Operations as well as the way services are delivered. While general IT application tools and Integrated Library Management Systems are largely used in housekeeping operations, like acquisition, cataloguing, circulation control, serials control etc; Internet has been used extensively as a resource as well as a tool to deliver the Library and Information Services (LIS). In this lesson we will study how ICT has had impact on delivery of LIS.

In the specific context of LIS, one of the implications of use of ICT is that Libraries can reach out globally to provide their services 24-hours a day in very cost effective manner. ICT has enabled users to avail many services without any human intervention, the role of the role of Library and Information Services (LIS) professional is changing from an intermediary to a facilitator and enabling. In this Unit we have grouped the ICT enabled services into two categories as follow:

1. ICT enabled conventional Library and Information Services (LIS), that can be delivered more efficiently through use of ICT, and
2. New Services, which have been made possible due to developments in ICT.

In the early 1970s libraries began to adopt software applications to allow them to perform specified function more efficiently. These applications were frequently developed by the University or research institutions with some cooperation from
commercial software and hardware firms in time. Theses system became more widespread and the benefit more evident. The next phase combined several library activities into one integrated system allowing libraries to perform almost all their functions online. This produced the turnkey systems commonly known as integrated Library system that subsequently dominated library management and service functions. Data entered once could be used in multiple ways, which increased electricity and accuracy. These integrated software applications were introduced to the market place using minicomputers capable of processing of Machine Readable Cataloguing (MARC) records. A standard record format in 1980s era of one way networking over communications networks were launched in the libraries. At this stage hardware operating system and applications software were proprietary and permitted find customization or sharing between libraries and their users. The transition from large scale computing technologies to microcomputers was well under way by the mind 1980s. This trend required reeducation of library and systems staff, which added significant cost to libraries. Changes followed different library application providers more powerful technologies, and software application and networking configuration that were no longer developed in-house. Library and information centres of all type began utilizing new application systems to automate resource sharing. Union catalogs and Inter-Library Loan modules were developed to allowing cooperating institution to combine their catalogues and allow patrons or one library to request and barrow materials from linked Institutions. These technologies fostered the growth of library consortia and the extension offering libraries and computing centres were tacking communications. Relational databases, and information distribution challenges. It become key for Universities. Research organizations and information centres to provide their campuses with communication technologies that wired libraries, classroom, laboratories, dormitories. Networking of such Institutions were prerequisite for accessing local Internal Internet database resource Internets provided campus connectivity using TCP/IP communications standards. The 1980s saw a greater use of campus communication. Infrastructures and commercial communication system to create to store Information and then to deliver it from Library and Information centres to end users. Large to database to from periodical became Increasingly available to digital format at first on CD-ROM, later via, online services. Libraries Services are
Transitioning from local Traditional Collections to global resources provided on demand via the next the most advanced networking Technology.

2.1 Concept of IT and Information Services in Libraries

The concept of Information Technology (IT) has been described in the library literature in different ways. Wilson (1992) defined IT as, “it is the means by which science is used in the collection, storage, processing and movement of information”. Womboh and Abba (2008) stated that ICT and IT (Information Technology) are similar terms that are used interchangeably. They cited de Watterville and Gilbert (2000) who defined ICT as the acquisition, analysis, manipulation, storage and distribution of information; and the design and provision of equipment and software for these purposes.

Other scholars see the term information and communication technology as a term that involves a lot of activities related to information handling and processing. For instance Shariful Islam and Nazmul Islam (2006) considered ICT as “the use and application of computers, telecommunications and microelectronics in the acquisition, storage, retrieval, transfer and dissemination of information”. According to Adesanya (2002), IT permits dissemination of information of greater value effectively and efficiently to the world at large through large number of media (wide variety of sources) e.g. computer databases, Internet services, online information retrieval, compact disks, etc.

Accessibility of information sources is an important recurring theme in the literature. According to Aguolu and Aguolu (2002), resources may be available in the library and even identified bibliographically as relevant to one's subject of interest, but the user may not be able to lay hands on them. One may identify citations in indexes, but may not have access to the sources containing the relevant articles. The more accessible information sources are, the more likely they are to be used. Readers tend to use information sources that require the least effort to access. These observations have been validated by empirical studies such as Slater (1963), Allen (1968), and Rosenberg (1967). The user may encounter five possible types of inaccessibility. The types are conceptual, linguistic, critical, bibliographic, and physical inaccessibility. Aguolu and Aguolu note that availability of an information source does not necessarily imply its accessibility, because the source may be available but access to it is prevented for one
reason or the other. Osundina (1974) studies the relationship between accessibility and library use by undergraduates in Nigeria and notes that the problem of Nigerian students is not the question of wanting to use the college library, but whether or not the university library can provide for their needs, and whether there is access to what is provided.

Aina (1983) writes on access to scientific and technological information in Nigeria, revealing that of the 7,014 scientific papers published between 1900 and 1975, 5,607 (79%) are journal articles and 1,116 or (20%) of these journal articles were not indexed or abstracted, making them inaccessible. Further analysis shows that 77% of the papers not covered by any indexing or abstracting services were published in Nigeria. He recommends the establishment of a National Science Information Center to acquire, organize, and disseminate scientific information sources in Nigeria and other places.

Olowu (2004) identifies natural and artificial barriers to free access to information. The library's poor reputation was attributed to lack of accessibility of information sources. Iyoro (2004) examines the impact of serial publications in the promotion of educational excellence among information professionals receiving further training at the University of Ibadan. The study looks at the perception of how serial accessibility has contributed to students' learning process. Serials were found to play a significant role in the acquisition of knowledge, because the serial collection was easily and conveniently accessible.

In a similar study by Oyediran-Tidings (2004) at Yaba College of Technology, Lagos, low use of the library by students was observed. This was attributed to expressed accessibility problems. Neelamegham (1981) has identified accessibility as one of the prerequisites of information use while Kuhlthau (1991) argues that the action of information seeking depends on the needs, the perceived accessibility, sources, and information seeking habits.

Aguolu and Aguolu (2002) reveal that efforts are being made worldwide to promote access to information in all formats. They lament the attendant features of underdevelopment such as power failure, machine breakdowns, and lack of spare parts
and technicians, which intermittently stall the performance of the modern gadgets of information storage and transfer in developing countries.

Buckland (1975) analyzes frustrations felt by users who fail to find the information sources they want in the library. He outlines four relationships between the user and availability or resources, which are:

1. The greater, the popularity, the lower the immediate availability.

2. The longer the loan period, the lower the immediate availability, the shorter the loan period, the higher the immediate availability.

3. The greater the popularity, the shorter the loan period has to be and the less the popularity, the longer the loan period can be.

4. Increasing the number of copies available, like shortening the length of loan periods, increases the immediate availability.

A study by Marama and Ogunrombi (1996) confirms high unavailability of library and information science (LIS) collections in most Nigerian university libraries, which had a negative effect on the use of information sources in the libraries studied. The librarians cannot conduct quality research and get published, and library students cannot even use library services. The authors recommended that at least 5 percent of the book budget be set aside for LIS information sources. The study, though limited to LIS, can be generalized to other subject areas. Unomah (1987) conducted a study at the former Bendel State University to determine the unavailability rate in the library and to find out its causes. The survey revealed an unavailability rate of 34 percent. One effect on the use of library service was that 300 users (71.4%) gave up and went away frustrated. On acquisition performance, the survey showed that the library acquired only a little more than half the items requested. A similar study by Okiy (2000) showed an unavailability rate of only 7.5%. Iyoro (2004) found that availability of serials at the University of Ibadan was 94 percent, with 242 of 256 respondents agreeing that serial publications are available and readily accessible.

Ajayi and Akinniyi (2004) found frustration among information seekers due to the non-availability of sources. Aina (1985) analyzed the availability of periodical titles used in
Nigerian libraries, finding that only 67 (11.5%) of the 578 periodical titles studied were not available in any of the major libraries, and confirming a high availability rate. Oyediran-Tidings (2004) studied information needs of library users at the Yaba College of Technology, Lagos, and observed low use of the library by the students, which was "attributed to the expressed unavailability of desired information resources." The paper suggests seeking user input for the acquisition process and policy.

Mathews (1981) executed a general evaluation survey of the academic community to ascertain whether resources, services and facilities of the Iowa State University Library meet the needs of its users. It was titled as “Survey of User Services: General Evaluation Survey”. Author examined the users’ frequency of visit, reasons for visit, use of material, use of catalogue, computerized literature searching, satisfaction with collection, etc. Prather and Clemons (1981) “Results of a Survey of Pullen Library Users”. Authors conducted a survey of the users of the Georgia State University Library to examine their usage of library and perceptions about its adequacy. Results of the study revealed that users were using library for non-book related purposes. Undergraduates were using it heavily for studying, whereas faculty, staff and alumni were using for personal research.

Bavakutty (1985) carried out a study to examine the use of libraries of colleges affiliated to University College of Calicut, Kerala under name “Incentives for Use of College Libraries”. Opinions of 404 students were collected. The students of govt. colleges were using libraries mainly for outside their study needs whereas those of private colleges were using libraries for curricular purpose. Onardian and Onardian (1986) invited the opinion of undergraduate students to assess the use of Ahmedu Bello University Library, Nigeria for study “Nigerian University Library Services: Students Opinion”. Authors concluded that large number of users visited library frequently. 27 Majority of them were visiting to study, using library books. Only 10% users were found not satisfied with library. Lack of needed books in library was one of the main causes for user’s dissatisfaction.

Mulla and Chandrashekara (2006) “E-Resources and Services in Engineering College Libraries – A Case Study”. Study was conducted to examine the efforts made by the engineering college libraries in Karnataka to build electronic resources. Results of the
study revealed that collection and service infrastructure of the libraries in sampled regions were not up to the mark and libraries were struggling to build digital collection and in disseminating digital information due to lack of ICT infrastructure, IT trained manpower and paucity of finances, etc.

2.2 ICT for Libraries

Information society emerged in the Western countries, is making a powerful impact even on the developing countries. Impact of information technology on the socio-economic development is a matter of great discussion and great concern to all the nations in the world. However, the future of information technology and its economic and social consequences are as yet unclear. The impact of information technology is described by different futurists in many different words. Some called it as ‘Information Age’; ‘Information Society’; ‘Paperless Society’; ‘Global Village’; ‘Electronic Offices’; ‘Digital Libraries’ and so on.

As Library and Information Science (LIS) education moves into the 21st century changing society where changes occur due to the emergence and advancement in Information and Communications Technologies (ICTs), which requires the LIS professionals to acquire new IT skills for survival, Nigerian LIS schools are expected to brace up for this challenging situation. The influence of Information and Communication Technologies (ICTs) is now manifested in every sphere of human endeavor including the LIS field which is considered by many writers (Bavakutty, Nasirudheen and Abdul Majeed, 2008; Karisiddappa, 2004; Minishi-Majanja, 2007) as pervasive. Abubakar (2009) observes that we now live in a changing society where information technology has taken the centre stage and is accompanied by massive increase in knowledge which leads to a new paradigm in the LIS field. Similarly, Mohammed (2008) has noted that the advances in the sciences and in the application of Information and Communication Technologies (ICTs), particularly the Internet, Intranet and other network technologies have continued to impact positively on the methodologies of library and information service delivery, education and training of information professionals as well as in the area of information seeking behaviour and use. Thus, ICTs have now become common features in all fields. Mêgnigbêto, (2007)
notes that the inclusion of ICTs into many professions has led to today’s society been addressed as the Information Society.

The dramatic changes in the global information environment, where ICTs serves as the driving force has led to very high expectations on the part of LIS schools across the globe. The expectation is centered on the need to produce graduates that will survive in the 21st century dynamic information arena. Indeed writers like Lancaster (1994) have observed that the LIS field, more than any is the most severely challenged by ICTs as such it requires visionary curriculum. Varalakshmi (2006) opined that the 21st century information professional must possess skills in selection, content management, knowledge management, organization of information on intranets and the Internet, research services, developing and maintaining digital libraries, and bringing information resources to the desktop which requires educators to assess the skills needed so as to prepare the students for employment challenges. The foregoing has indicated that the infusion of ICTs in LIS curriculum in Nigeria has become inevitable for obvious reasons one of which is the strategy for survival. According to Minishi-Majanja (2007) ICTs are significant in the achievement of LIS educational goals/objectives and the fulfillment of the primary tasks of LIS schools. Thus, the current trend now is the global interest in LIS education has been shifted towards reforms in the LIS curriculum in order to accommodate the emerging ICTs. Miwa (2006) has noted that due to the rapid shift towards an information and knowledge-oriented society, information professionals need new skills to take advantage of ICTs. Consequently, many colleges and universities have modified their curricula to emphasize ICT. Nigerian LIS Schools are not exception.

Ani, Esin and Edem (2005: 701-708) investigated the extent of adoption of information and communication technology in university libraries in Nigeria. They identify major obstacles that influence effective adoption of ICT in university libraries are inadequate funds and the poor state of electricity in Nigeria.

Schofield; McMenemy and Henderson (2004) indicated that both libraries had been successful in providing access to ICTs for people who would otherwise have had no access, although the age of the technology available in the more established learning
center had a negative impact on users, and the take-up of online learning opportunities had not been as prominent as would be expected.

Gulati (2004) discussed the status of information and communication technologies usage in Indian libraries with special reference to special libraries and the efforts made by various institutions to propagate information products and services. He highlights the consortia efforts in India like JCCC Consortium, INDEST Consortium, CSIR E-journal Consortia, and UGC Infornet.

Talagala and Gamage (2003: 1) examined the development of library automation activities in Sri Lanka and also discuss the utilization of software in the automation of libraries, different software packages used in library automation and the extent of their use in library operations in Sri Lanka.

Mannan (1998: 101-118) stated that the advancement of library automation in Bangladesh is not up to mark and the barriers traced out for these conditions are mainly lack of legal sanctioned by the concerned authorities, adequate financial support, proper policy and technological facilities.

2.3 ICT based other Services

Sambasivan (1998) mentioned the sweeping changes brought about by information and communication technologies and discussed the phenomena of computer networking, emergence of potentialities of internet, emergence of list or mail server, application of e-mail and websites. Also highlighted the hypermedia links, and other revolutionary innovations and technologies, and their impact on libraries and information centers.

Mudawi (2005) did a research on *The Use of the Internet and E-mail among Sudanese Librarians: A Survey Report*. The objective of this research paper is to assess how the internet is used, in particular for e mail-based library services in Sudan. Design/methodology/approach: This research is based on primary data: a structured field survey was conducted among six information institutions in Sudan. Because the number of librarians in these institutions was thought manageable, all librarians in the selected institutions were surveyed. The response rate reached 88.1%. The SPSS package was used for data analysis, and the alpha value found to be 79 per cent.
Findings: The major patterns of the Internet use were: Chat sessions; checking e-mails; and surfing professional sites. Majority of the samples did not utilize e-mail for library services as such. The low use of the Internet resources for library services was due to inadequate access and inadequate time that can be devoted to the Internet activity, rather than a matter of lacking skills per se. But it was also found that there was a real need for training on using the Internet for library services.

2.3.1 Internet Access

The Internet plays a crucial role in the access of information resources. "Sources of information and other opportunities available via the Internet are increasing exponentially. This comes with the steady increase in Internet use for education" (Edwards & Bruce, 2002) and research. Also, with the growth of information on the Internet and the development of more sophisticated searching tools, there is now the more likely possibility of finding information and answers to real questions. But, within the morass of networked data are both valuable nuggets and an incredible amount of junk (Tillman, 2003).

Ani (2010) investigated the extent and level of internet access and use by undergraduate students in three Nigerian universities as well as the electronic resources used by these students on the Internet. The findings of the study revealed that the Internet was extensively used by undergraduate students in the surveyed universities. In spite of the extensive use of the internet, there existed a poor level of use of electronic resources such as the electronic journals and online databases which were essential for learning and research. The findings of the study also revealed the need for effective user education on the Internet access and use in university libraries in Nigeria for optimal utilization of electronic information sources.

2.3.2 Use of Web based Resources

Li (2006) explored key issues involved with opportunities, challenges, and future developing trends of delivering dynamic and distributed web-based academic library information resources, services, and instructions for library users in the digital age with respect to leverage quality library user services in the digital age: roles of academic
libraries; funding support; information resources; information access; information 23 services; instructions and trainings; impacts of cutting-edge technologies and emerging technologies; web contents management and knowledge base; assessment and evaluation; and Librarians.

Kovacs and Elkordy (2000) threw light on the guidelines and strategies to find, evaluate and select the web-based information resources in article named “Collection Development in Cyberspace: Building an Electronic Library Collection”. The focus of the paper was on the web-based information resources rather than the electronic information resources.

2.3.3 E-resources/ E-Journals:

Patil and Parameshwar (2009) in paper titled “Use of Electronic Resources by the Faculty Members and Research Scholars in Gulbarga University, Gulbarga: A Survey” disclosed the use of electronic resources by the faculty members and research scholars in Gulbarga University. Questionnaire was used as a data collection tool. 45 Study revealed the need to train users in using the electronic resources.

Pushpalatha and Mallaiah (2009) executed a study named “Use of Information Resources in Chemistry: A Study of Mangalore University Library” to know the users opinions about adequacy of library resources. It was found that majority of the users were visiting libraries to borrow books followed by consulting the periodicals. Online Public Access Catalogue and assistance of library staff were the primary means to locate needed documents. About 58.92% post graduate students rated library collection as adequate to meet their information needs, whereas 40% research scholars and 83.33% of the teachers considered at partially adequate.

Mallaiah and Gowda (2009) in paper “Collection Development in Mangalore University Library: A User Study” discussed the usefulness of collection development in a university library and attempted to find whether the UGC-INFONET E-journals were meeting the users information needs.
2.3.4 Inter Library Loan and Resource Sharing

ILL is an important resource for users, providing support for research and academic course work (McCaslin, 2010). In his article on the expectations of ILL in an economic crisis, he points out that patron needs do not decrease along with the financial situations of their institutions. In fact, in an era in which collection budgets – and hence local collections are shrinking, ILL requests continue to increase. Two recent surveys of ILL conducted by Primary Research Group questioned participants on the total percentage in increase or decrease of ILL over the past three years, reporting a median increase of 9.5% to 14 (Primary Research Group, 2009, 2011). The ARL study from 2004 found an increase in borrowing (mean 75 percent) and lending (mean 59 percent) requests from 44 libraries that had participated in the 1996 and 2002 studies (Jackson, 2004). These changes emphasize the need to know the current costs of performing ILL.

That in studies up to June of 1998, copyright was not included and calculated on average cost per transaction. While the Commission on New Technological Uses of Copyrighted Works (CONTU) allows five articles from one title to be copied within the calendar year, the article points to a study from 1997 that found median copyright fees for all subjects to be $5.00. This marginal cost significantly increases the total cost per transaction. For this reason, Zhou recommends including copyright cost in any future studies.

2.4 Open access and open source software for Libraries

Open access, open source software, and open standards are three concepts that have been receiving increased attention lately in the library world. Open access is seen by some as a possible solution to the increasing price of serials and as a way for governmental funding agencies to receive a better return on investment. Open source software can benefit libraries by lowering initial and ongoing costs, eliminating vendor lock-in, and allowing for greater flexibility. Open standards allow for interoperability to exist between diverse library resources and eases data migration between systems. All three of these concepts are important to libraries individually and they can be even more beneficial when they are leveraged simultaneously.
2.4.1 Open Access

Open access to scholarly information has been a hot topic for debate among librarians, scholars, and publishers over the last few years. Recent proposals by the National Institutes of Health (NIH) in the United States (requiring for scholarly works that come out of NIH funded research to be made available via NIH's PubMed Central open access database), by the government in the United Kingdom (requiring that all UK government-funded research to be available via open access), and by others has expanded this debate. Various different, though similar, definitions of open access exist with the Budapest Open Access Initiative definition being the most widely used (Goodman 2004). Other definitions include the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, the Bethesda Statement on Open Access Publishing, and the Washington DC Principles for Free Access to Science. While there are multiple definitions and flavors of open access, open access basically calls for scholarly publications to be made freely available to libraries and end users.

Willinsky (2003) identified nine flavors of open access. The flavors are: 1) e-print archive (authors self-archive pre- or post-prints), 2) unqualified (immediate and full open access publication of a journal, 3) dual mode (both print subscription and open access versions of a journal are offered), 4) delayed open access (open access is available after a certain period of time), 5) author fee (authors pay a fee to support open access), 6) partial open access (some articles from a journal are available via open access), 7) per-capita (open access is made available to countries based on per-capita income), 8) abstract (open access available to table of contents/abstracts, and 9) co-op (institutional members support open access journals).

The growth of the open access movement is partially in response to the enormous costs of many scholarly journals. With traditional journal publication methods it is not uncommon for an institution to have to pay for an article twice. First they pay scholars to produce the work and then the institution's library pays to purchase the work back from the journal publisher. Anderson (2004) is correct that there is no such thing as free information and that there are costs involved in producing scholarly information.
However, with the advent of new technologies and software programs, it is becoming increasingly less expensive to compile and distribute scholarly information. By using different funding methods and electronic delivery of journals, the costs can be absorbed by alternative means to subscription fees. One of the great benefits to open access is that libraries in smaller institutions or in economically disadvantaged areas around the world can have greater access to these scholarly resources.

Open access helps to ensure long-term access to scholarly articles. Unlike articles that are licensed in traditional article databases, libraries and others can create local copies and repositories of these resources. Libraries, by working together to make repositories of open access literature, can ensure continued access to these scholarly publications into the distant future.

2.4.2 Open Source

Open source software is software that includes source code and is usually available at no charge. There are additional requirements besides the availability of source code that a program must meet before it is considered open source including: the software must be free to redistribute; derivative works must be allowed; the license cannot discriminate against any persons; and the license cannot discriminate against any fields of endeavor. Software that is licensed under an open source license allows for a community of developers from around the world to improve the software by providing enhancements and bug fixes.

Libraries can realize many advantages by using open source software. One of the most obvious advantages is the initial cost. Open source software is generally available for free (or at a minimal cost) and it is not necessary to purchase additional licenses for every computer that the program is to be installed on or for every person who is going to use the software. Open source software not only has a lower acquisition cost than proprietary software, it often has lower implementation and support costs as well.

It is easier to evaluate open source software then proprietary software. Since open source software is typically freely available to download, librarians and systems administrators can install complete production-ready versions of software and evaluate competing packages. This can be done not only without any license fees, but also...
without having to stick to a vendor's trial period, evaluate a limited version of the software, or deal with the vendor's sales personnel. If the library likes an overall open source package but would like a few added features they can add these features themselves. This is possible because the source code is available. Even if a library does not have in-house expertise they can benefit from source code availability because another library may be able to provide them the fix or they can hire a consultant to make the changes that they desire. Fuchs (2004) points out that if a proprietary program "is deficient in some way [the user] must wait until the vendor decides it is financially viable to develop the enhancement, an event that may never occur." With open source software the user can develop the enhancement themselves.

Open source software allows for more support options. Proprietary software vendors often package service with the product. This is particularly true of proprietary library-specific software. When support from a vendor is inadequate it is an additional expense to purchase another tier of support, assuming that it is even available. Open source software allows for different vendors to compete for support contracts based on quality of service and on price. Access to the source code also allows for self-support when practical and desired.

The amount of vendor lock-in is dramatically reduced with open source software. The large initial costs often associated with proprietary software makes it difficult to reevaluate the choice of software when it does not live up to expectations.

Proprietary software can lead to a single point of failure. If a vendor goes out of business or decides not to support a program anymore there is often nothing an user can do. Organizations using the software could provide self support or other vendors can come in and fill the void left by the previous vendor if the program were available as open source software.

2.4.3 Open Standards

Pountain (2003) defines an open standard as "a standard that is independent of any single institution or manufacturer, and to which users may propose amendments." This definition is a good starting point, but in reality the term "open standard" means different things to different people. Three key characteristics of open standards
identified by Coyle (2002) are 1) that anyone can use the standards to develop software, 2) anyone can acquire the standards for free or without a significant cost, and 3) the standard has been developed in a way in which anyone can participate. When a standard has the first two of these characteristics (the ability to use the standard and to obtain it without a significant cost) it can be said to be an open standard in an utility sense. That is to say that an open standard is a standard that is not encumbered by a patent, does not require proprietary software, and can be utilized by anyone without cost.

Proprietary standards can sometimes be expensive and it may be cost prohibited to purchase access to a proprietary standard if it is ever needed. Many people consider a standard to be sufficiently open as long as it is open in a utility sense.

Others take this a step further and consider a standard to be open only if the process meets the criteria of being created and modified in an open process as well. An example of a standard that fits the definition of a standard that is open in utility but not in process is XHTML. In order to help develop the XHTML specification one has to be a member of W3C. In order to become a member of W3C businesses pay between $5,000 and $50,000 per year (Coyle 2002).

Conversely, Dublin Core is a completely open standard that is open both in utility and in process. All one has to do is show up and participate in order to contribute to the development of Dublin Core.

It is important for libraries and other cultural institutions to ensure long-term access to digital information. The rapid growth in digital technologies has led to new and improved applications for digital preservation. However at the same time it has also led to some problems as well. Two of these problems are obsolescence and dependency issues. The obsolescence problem is caused by the advances in hardware and software making many computers obsolete within three to five years (Vilbrandt et al. 2004). Dependency problems can arise if tools that are needed to communicate between systems or read file formats become unavailable. In order to account for obsolescence and dependency problems organizations must be able to migrate data into new systems. Data migration, however, cannot occur without access to data file formats.
Properly created open standards for file formats are less likely to become obsolete (Vilbrandt et al. 2004) and are more reliable and stable than proprietary formats (Breeding 2002). In the event that an open standard file format does become obsolete, having access to the file format would allow anyone to easily, and legally, create a data conversion utility. File formats that use open standards can assist in long-term archiving because they allow for software and hardware independence. Open standards help alleviate issues caused by obsolescence or dependency problems since files created in formats that adhere to open standards are "more likely than proprietary formats to be readable twenty or fifty years from now" (Baker 1999). This allows for greater flexibility and easy migration to different systems in the future.

The use of open standards can help assure interoperability of diverse systems. There are various software packages that are being used to create digital libraries, online library catalogs, and other resources that libraries rely on. These various systems need to be able to interact in order to provide the best possible service to patrons. The way to make certain that these diverse systems, and any future systems, can communicate with each other is by using open standards to help achieve the "free flow of information through interoperability" (The Open Group 2005).

Many different organizations are advocating open standards. One of the most prominent organizations is The Open Group which created the Developer Declaration of Independence. The hope is that the Developer Declaration of Independence will help pull together the information technology industry in support of open standards. Some library-centric initiatives, including the Open Archives Institute (OAI), also support open standards. OAI's mission is to develop and promote "interoperability standards that aim to facilitate the efficient dissemination of content" (Open Archives Institute 2005). OAI has created a Protocol for Metadata Harvesting (OAI-PMH) that provides an application independent interoperability framework based on metadata harvesting. Other common open standards for information retrieval relevant to libraries include Digital Object Identifier System (DOI), Dublin Core Metadata Initiative (DCMI), and Open URL.

While open standards have garnered increased attention in libraries recently, the use of open standards in librarianship is not new. The use of open standards in librarianship
can be traced all the way back to the first American Librarian Association meeting in 1877 when the dimensions of the card catalog were standardized to $7.5 \times 12.5$ centimeters (Coyle 2002). A more modern example of an open standard used by libraries is the Machine-Readable Cataloguing (MARC) record. Other common open standards for bibliographic data include Metadata Object Description Schema (MODS), Metadata Encoding & Transmission Schema (METS), and the XML Organic Bibliographic Information Schema (XOBIS).

The benefits of open access, open source, and open standards are numerous. The benefits include lower costs, great accessibility, and better prospects for long-term preservation of scholarly works. Libraries should embrace all three of these concepts now and in the future. By supporting open access, open source, and open standards libraries not only can help ensure that their current and future patrons will have easier and more comprehensive access to scholarly research, they will also be helping other libraries around the world, including those in disadvantaged areas, to have access to important scholarly research.

2.5 Digital or Virtual Library

Within the library field there is a tendency to refer to the 'virtual' library, the 'digital' library, and the 'electronic' library interchangeably. Waters (1998) describes the phrase 'digital library' as replacing earlier references to 'electronic' and 'virtual' libraries. A few years earlier, Graham (1995) stated that 'virtual library' is a companion term to 'digital library' and that up to 1995 both terms were 'used narrowly to define a quantity of databases available for use at a given time'. Graham's idea that the virtual and digital libraries are synonymous is interesting, but as he himself admits, the definition he provides is very narrow.

Wainwright (1996) believes a digital library possesses the same functions and goals of the traditional print-based library and that the difference lies in 'the digital part of the term [which] indicates merely that the material is stored and accessed digitally'. Like Graham's definition, Wainwright's definition of the digital library is also very narrow. A more comprehensive definition of the digital library is provided by the Digital Library Federation (1999) in the United States: Organizations that provide the resources,
including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community or set of communities.

Other definitions of the digital or virtual library provide a more integrated approach. McMillan (1999) stated 'digital libraries and traditional libraries should not be separate, but should coalesce to accomplish more than either can do independently to serve the user community on the highest order'. McMillan (2000) later refined her definition of a digital library to one that 'should be a seamless extension of the library that provides scholars with access to information in any format that has been evaluated, organized, and preserved' and that the digital library 'adds value and saves time while extending the hours of access'. Mason (1998) believes it is imperative for libraries to offer both print and digital resources, 'together they are the yin and yang of knowing'. Rusbridge (1997) believes the library and its governing organization is critically important in digital libraries, 'we must provide integrated access for our community to a wide range of resources, placed in a service context'.

### 2.6 Digital Libraries in India

The main objective of a library is to preserve information to facilitate future access and dissemination of knowledge. Digital Libraries (DLs) are not exception. The extra advantage of DLs are that users can access and find information independently from any corner of the world irrespective of the caste, creed, color and economic status of the user. But DLs are of little value unless they are easy to use effectively (Arms, 2000). Digital library users often have little formal training and they normally use independently. Of late the Digital Libraries initiatives in India have got momentum. DLI is the first major government funded Digital Library project in India in collaboration with other countries.

The terms such as ‘electronic library’, digital library’, ‘virtual library’, ‘web-library’, or ‘on-line library’ have been used synonymously to represent the same concept. Though the terms used synonymously to represent the same concept, the terms are used differently by different authors in the literature, the central theme of the terminology
remains focused on digital content of the documents (Association of research libraries, 1995).

Digital resources are being mounted online at an enormous rate (Lyman, 2003). But effective use of these resources is being hampered, as there is no uniform and consistent way to find the useful materials existing over the Net. It is found (Tenopir, 2003) that both faculty and students use and like electronic resources and most easily adopt them if the sources are perceived as convenient, relevant, and time saving to their natural workflow. It is also important for capacity planning, systems design, user support and strategic planning (Greenstein, 2000). Digital information is useless unless the formats, protocols, and metadata are recognized and processed by the users.

Saurine (2000) points the new technologies and Internets have challenged traditional library services and practices. Hisle’s (2002) Task Force Report illustrates that i) Recruitment, education and retention of Librarians; ii) Role of library in academic enterprise; iii) impact of information technology on library services; iv) Creation, control and preservation of digital resources; v) chaos in scholarly communications; vi) support of new users; and vii) Higher Education funding are the top issues facing academic libraries. Sun micro system’s (2003) white paper lists some of the issues faced by today’s libraries to provide greater information access to users. They are:

- Need for trained staff in technology and traditional library disciplines;
- Investment in continuing education and Budgetary restrictions;
- Physical and digital subscription resources are increasing in volume and cost;
- Growing popularity of Internet as research tool;
- Increased user expectation with widespread use of Internet and
- Need for library’s link with other academic departments.

Loriene Roy and Bill Crowe(2006) the 2006 presidential candidates for American Library Association identified i) the need to engage library community with Google and commercial service providers, ii) the challenge of succession plan, iii) challenge of communication library stories to outsiders, iv) need for continuing education and
training for library workers, v) tailoring library services to respond to user needs, vi) increasing salaries and benefits of librarians as the issues facing the library community.

At present so many open source digital library software are available free of cost to customize and use as per requirement of library few may be named as E-prints, Greenstone, Dspace, etc. These are the most frequently used digital library software presently used in Indian Libraries. All the different software have their own features and characteristics. The e-print archives are entirely scientist driven, and flexible enough either to co-exist with the pre-existing publication system, or to help it evolve into something better able to meet researcher needs (Ginsparg 2000). The Greenstone Digital Library Software (GSDL) offers exciting ways to build and distribute digital document collections. It helps us to publish digital collections on the Internet or on CD-ROM. Within a few minutes time, one can build full-text search indexes and browsing classifiers for any collection of digital documents (Rajasekharan and Nafala, 2007).

Mandali (2003) defined the DSpace as a fairly powerful software, major advantage of which is that it allows submission of digital documents by it members. Presently, it lacks METS (Metadata Encoding and Transmission Standard), which will make it much more powerful. However, it is expected that the next version will have METS.

### 2.7 Role of Librarian in IT enable world

In order to reach an understanding of the role of librarians in the virtual library environment, it is worthwhile examining the role librarians have filled in the past. In ancient times, there was little if any distinction between an archive and a library. For many centuries book collecting was an opportunity either to display one’s wealth, or the results of scholarship. It was not until the nineteenth century that library collections became more universally available and library science began to codify standards for describing and organising resources and librarians began to move beyond merely keeping and preserving books. Melville Dewey wrote in an early edition of the *American Library Journal*:

> It is not enough that the books are cared for properly, are well arranged, are never lost... [The librarian] must put every facility in the way of the readers, so
that they shall be led on from good to better. He must teach them how, after studying their own wants, they may themselves select their reading wisely. (Rice-Livy & Racine, 1997)

The role of the librarian grew from that of a collector and preserver of information resources to a professional involved in very complex issues of organization, the dissemination of and access to information.

The role of the librarian, particularly during the past two decades, has further evolved to encompass the burgeoning technological developments. Crawford and Gorman (1995) have defined the role of the librarian today:

To acquire, give access to, and safeguard carriers of knowledge and information in all forms and to provide instruction and assistance in the use of the collections to which their users have access... [libraries] are about the preservation, dissemination, and use of recorded knowledge in whatever form it may come. (pp 3,5)

Rusbridge (1997) agreed with this definition, writing:

The role of the library is to select, acquire, organize and make available an appropriate subset of ...resources... The library has a role here in the digital world as with print - not just in excluding access to rubbish, but in encouraging access paths to quality.

This broad understanding of the role of libraries in the electronic age has gained widespread acceptance. In a 1998 report to the European Parliament The Role of Libraries in the Modern World a similarly broad view was accepted:

The unique function of libraries is to acquire, organise, offer for use and preserve publicly available material irrespective of the form in which it is packaged (print, cassette, CD-ROM, network form) in such a way that, when it is needed, it can be found and put to use'.

These definitions provide an indication of the roles which librarians have assumed during the final half of the twentieth century. They acquire information resources relevant to their user population in whatever format is available and appropriate; they
organise the information within the library collection; they provide a means for users to access that information; and they educate users in accessing and interpreting information resources. Librarians are moving beyond the traditional roles of collection maintenance and custodial duties to newer functions of translating, accessing and marketing resources beyond the walls of the physical library collection (Rice-Livy & Racine, 1997).

The formation of a working definition of the virtual library environment and the preceding examination of the role of librarians both in the past and the components of their role today, provides many indications of the elements making up the overall activities of the librarian within that environment: to provide intellectual access to information in any format, to evaluate available sources of information, to organize and structure information, to ensure the preservation of information, and to provide specialized staff to offer instruction and assistance in interpreting resources and accessing resources. Rusbridge (1998) described the role of the librarian in the print environment as the person responsible for selecting, acquiring, organizing and providing access to relevant information. These tasks have become more complex as the volume and range of information available has increased (Dugdale, 1999). Not only that, but new tasks and roles have emerged. Both these traditional roles and the newly emerging ones will be examined in addition to some of the economic implications, to discover the future role of the librarian in the virtual library environment.

Providing intellectual access to information is a role librarians have filled for a long time. Traditionally librarians have done this via print-based resources. During the second half of the twentieth century the range of available resources expanded to include microform, video and audio formats. The final decades of the twentieth century witnessed a further explosion in formats, and libraries can now offer information in the form of print, audio, video, microforms, numeric, computer programs, or multimedia composites of each. For librarians, the most important issue is to provide the information in whatever form it is packaged. As McMillan (2000) observed, librarians do not attempt to meet the information needs of users with just one format.

Within the virtual library environment, the choice of format is not the most crucial issue: it is being able to provide information resources to patrons - regardless of format.
Librarians and patrons will no longer be restricted to 'a single entity where everything is stored', but rather librarians will be able to offer 'a range of services and collections, linked together or made accessible through electronic networks' (Lim, 1996).

While electronic access to journals appears to be a godsend to patrons and researchers, cutting out countless hours of tedious bibliographic detective work, the behind-the-scenes decisions and negotiations conducted by librarians to provide the service are fraught with numerous complex issues. Electronic serials must be evaluated against the relative importance of content. For example, scientific journals may lack full equations, graphics, and charts. Journals within the social sciences and humanities may lack book reviews and advertisements. These content issues must be weighted against issues of speed and ease of access (Miller, Peters, Pappano and Manuel, 1999).

Information retrieval is the most obvious skill a librarian demonstrates to the public. The increasing sophistication of search engine design is creating an environment where anyone can, at varying levels of efficiency retrieve information from the internet. It has been suggested that the skills of the reference librarian are becoming superfluous (Odlyzko, 1996). However, without professional guidance many searchers, particularly novice internet-users, do not exploit the full potential of search engines and consequently do not retrieve all the relevant information available to them. Pollock and Hockley (1997) examined the use of the internet by internet-naïve but PC-literate users and concluded that to execute successful searches, internet users need at least a basic understanding of internet searching concepts, but also very high levels of support - from a librarian or other experienced internet searcher.

McMillan (2000) notes that within the university environment, undergraduate students can be seduced by the convenience of information available through the internet and the intervention of the librarian can teach the difference between intellectual access and electronic access. She observed that librarians 'teach information discrimination through personalised research assistance, guidance, and instruction'.

Librarians working at integrating new technologies to form the virtual library are discovering an increasing demand for their professional skills. Cunnington (1998) describes the experience at the University of Melbourne in creating a single electronic
gateway to the university library's plethora of electronic information resources. One of the documented outcomes of the introduction of the new gateway included greater and more sophisticated demands by users, and a greater emphasis for customer service staff in the selection of electronic resources and instruction of users.

McMillan (2000) observes that the librarian 'makes a significant contribution, often defining the search, honing the researcher's goals, and helping the researchers to understand their needs'. She believes the value of human expertise, judgment and empathy are integral to the development of the electronic library environment. Wood and Walther (2000) also noted that rather than rendering the librarian obsolete, 'the digital revolution has made librarians all the more essential'. Hawkins (1998) observed that as the information explosion continues, everyone will need more help finding, sorting and filtering the available material.

The virtual library environment provides both an opportunity and a requirement for librarians to develop greater familiarity with IT-type skills. Garrod and Sidgreaves (1998) conducted research in the United Kingdom on the impact IT is having on the skills required of librarians working in the electronic and networked information resources environment. They concluded that staff working in different areas of university libraries required different skills. Paraprofessional staff required practical 'hands on' experience and training. Librarians are moving into database development, courseware, open learning and academic staff development and need a combination of knowledge, skills, aptitudes, and personal qualities in order to fill their multi-faceted roles.

2.8 Impact of Information Technology on Library

2.8.1 Library Services

There is no doubt that the technology in particular computers and ICTs have made the most impact on libraries in areas that require the rapid and accurate storage and processing of structured data the ability to operate for 24 hours a day, seven days a week and world wide connectivity and communication. Evans (2000) identifies key areas of recording stock (cataloguing) and its movement (circulation) as those most
affected by technological change. Continuing the discussion Evans states that the next step is that of 'seamless inter-lending of material, utilizing the strengths of developing standards and faster and more efficient technologies. Hyde (1997) suggests that in the future, staff will work, not in a physical library, but elsewhere with all electronic access to collections.

Debowski (1999) highlights the following key factors in his study:

Significant advances in technology and increasing costs of journals and other print resources- massive growth in electronic services;

Budgetary manoeuvres – staffing pared down to essential levels so that infrastructure services may be developed;

Decreasing numbers of library visitors. Reduced coverage of service points, sustaining basic services whilst offering extended electronic access; and

Outsourcing- Argument for a more cost effective system. Orenstein’s (2006) paper traces the history of technology movement in library field and discusses in detail the impact of technology on library functions. Few of observations and findings on impact of technology are listed below:

- Till ten years ago, libraries were book focused institutions. Library acquisitions, cataloguing and circulations were done via or managed by using print ledgers, pens and cards. Spreadsheets, databases or other s/w was never used to manage library data.

- The first major wave came with the advent of digital storage and network technology. In early 1990s Public Access Terminals and OPAC became ubiquitous to share information on library holdings. The access was PC-based. Access to holding to the outside world was not shared.

- In 1990s CD-ROMs were invented and used to store large data which were inserted into single use PCs. In other words stand alone versions were prevailing.
In late 1990s Internet became life blood of information sharing not just for libraries, but for commerce, education, government and general public. High speed networking availability facilitated instant transfer of both text and graphics from one server to another. Storage and access issues eliminated, yet it free for everyone to place anything on WWW resulting in false information.

While Internet is a wonderful thing it is not a substitute for campus library or librarian. Librarian guide users how to find information whether print or online.

Rate of distance users increased exponentially challenging librarians to make many resources available online.

The role of academic librarian in the academic age is to promote access to accurate information to users. However, this role became more complex with information age.

It is important to note that even with all technical complexity and additional responsibilities, the librarians’ core role as gatekeeper of information is unchanged.

Information searching, preparation of teaching materials, answering queries via technology is the great impact of Internet age.

The card catalogue replaced with web-based interface as a result the maintenance information was to be handled by technically competent support staff with accurate information. The typographical errors on card catalogues were widely noticeable online. It was also important to note, the online catalogue made accessible anywhere as it is web-based.

The library staff was identified as knowledge workers.

One cannot have good education without libraries, and one cannot have good library without good library staff.

Schatz and Chen (1999, p45) point that the public awareness of the net as a critical infrastructure in 1990s has spurred the new revolution of technologies for information retrieval in digital libraries. Further they say that digital libraries are a form of information technology in which social impact matters as much as technological advancement. Cairn cross (1997) explaining the speed of Internet and remote access
highlighted the death of time and geographical barrier. Further, the open search engines like Google, Yahoo etc. have become all-time powerful search tool for information seekers across the globe. Information services are generated using new tools and techniques to facilitate the right users to the right information (Khodeh and Dhar, 2002). Information technology has had a significant impact and has successfully changed the characteristics of information services being generated in libraries. Information technology also has a positive impact on all library and information services like reference services, current awareness services, online public access catalogue, etc. Human resources is another aspect which is influenced by the developments in IT and its application in libraries (Kanamadi and Kumbar, 2007)

2.8.2 Library Staff

Chowdhury and Chowdhury (2003) assert that changes in old traditional library skills in addition to the acquisition of other new relevant skills are necessary for library staff in order to be able to deal with the hybrid library. They specify a number of major skills as necessary for running the digital library, in addition to the overall understanding of the computer and internet, specifically knowledge of webpage design techniques. These major skills are:– Digitization and document management skills– Basic networking skills.– Skills that enable information professionals to design, and evaluate digital libraries systems and software. Choi, young and Rasmussen (2006) carried out a survey with a view to specifying the skills and knowledge needed by academic librarians so as to be able to run digital libraries. They came up with the conclusion that library professionals need skills on two levels; the first level is related to technology which includes digital library architecture and software, web marking languages, database development and management system, and web design skills. Whereas the second level according to Choi and Rasmussenis library-related which includes aspects such as user needs, digital archiving and preservation, cataloguing, indexing, and collection development. They also stressed other requirements such as communication and interpersonal skills, project management and leadership skills, grants and proposal writing skills, and teaching and group presentation skills. Malkawi, on the other hand, outlines three types of staff needed for the management of digital libraries, namely:1. Curational staff to prepare and process materials to be digitized,2. Core staff who carry out the digitization process and other related processes,3. Educational staff whose main
responsibility is to cater for user information needs. Any modern library and information professional must be knowledgeable in library automation, networking, internet surfing, and database management software (Aina, 2004). Therefore, according to Foo et al (2002), library and information specialists should complement their professional skills by hardware and software skills so as to be capable of working in an ICT intensive environment. ICTs are continuously updated and new forms are introduced. Digital formats such as e-journals and e-books have replaced traditional information resources. (Ashcroft and Watts 2004). Thus, there is a need for regular training for information professionals. Continuous Professional Training (CPD) is a must for information professionals in academic libraries so as to be able to maintain upto-date levels of expertise for coping with the evolving ICTs.

Given this, information professionals are now expected to be aware of and capable of using and demonstrating emerging ICTs (Nwakanma, 2003). There is a need for additional training to augment the traditional skills knowledge base with a competency in ICT use. Information professionals must be flexible, and adapt traditional skills to incorporate the requirements of technological advances (Biddiscombe, 2001; Sharp, 2001). Given the current situation, whereby ICTs are being continuously updated or introduced, and traditional formats are being replaced or supplemented by digital formats (such as journals and ebooks), it seems likely that there will continue to be a need for regular training for information professionals.

There is also an increased focus on communication skills, with more players involved in the electronic information environment. Information professionals are being called upon to work closely with ICT users and providers (including IT staff) and to work in collaboration with others in the profession (Wittwer, 2001). Some groups of users lack necessary IT skills to obtain quality information (Stubbings and McNab, 2001) and, therefore, information professionals will be called upon to act as both educators and intermediaries (Sharp, 2001). Given these circumstances, information professionals are required to have increased teaching and communication skills.

Thus, it is vital for those in management positions to recognize the imperative of continuing professional development (CPD) and ensure that staff are proactive in maintaining up-to-date levels of expertise.
The significance of CPD in this climate has been acknowledged by both the United Kingdom’s Chartered Institute of Library and Information Professionals (CILIP) and the United States’ American Library Association (ALA).

CILIP (2004a) advocate pro-active CPD in order to remain in touch with issues relevant to the information profession, and to allow individuals to take advantage of opportunities that arise. CILIP produce a Framework for Continuing Professional Development (CILIP, 2004b) designed to assist in the building of a personal portfolio, assessing competence and recording CPD activities and needs. CILIP also offers a number of facilities to support CPD, including workshops (in, for example, ICT and Internet Skills, and Professional and Technical Skills), conferences, a Chartership scheme, and advice on professional practice. Education and Continuous Learning is one of five key action areas for the ALA, with lifelong learning seen as being integral to providing high quality information services (ALA, 2004a). In response to this, the ALA holds conferences and events that support CPD (ALA, 2004b). ALA has also held three Congress for Professional Education that identify (amongst others) appropriate issues concerning CPD for information professionals, including core competencies.

Now, in addition to their traditional library skills and knowledge, many of today's professional librarians are expected to possess additional knowledge and skills required for work within the digital information world. Librarians are thus faced with the challenge of acquiring advanced knowledge and skills to augment what they traditionally learned, and to do so while at the same time there is a shortage of experienced library staff (Tennant, 2002). As a consequence, educating digital librarians who are competent to work in the dynamic and complex digital environment has become a high priority.

2.8.3Library Users

Information searching habits of Internet users is multi-faced and the literature available is extremely broad ranging. An attempt has been made to cover number of works that go beyond discussions of the information seeking behavior itself and its direct applications to closely related topics such as Internet use.
Chang and Perng (2001) carried out a research work on "Information search habits of graduate students at Tatung University". The purpose of their study was to investigate the information requirements and search habits of graduate students at Tatung University in Taipei City, Taiwan. They show that 90% of the subjects conducted information searches using outside sources in addition to the university library. They also reported making extensive use of the Internet in the recent past, mostly World Wide Web-based databases, electronic journals, and search engines.

Dong work emphasized the evaluation of the Internet. He reported the examination of the using the Internet resources and the evaluation of their usefulness from the Chinese students' and academics' point of view (Dong, 2003). Hölscherl and Strube (2000) conducted a study about Web search behavior of Internet experts and newbies. They found the differential and combined effects of both Web experience and domain knowledge.

A survey on the Internet access and the Internet use for health information among people living with HIV-AIDS was carried out by Kalichman et al. (2002). Spink and Jansen (2004) discuss the changes in Web search trends from 1997 to 2003 that explored how people search the Web. They show some patterns and trends in general Web searching. In summary, most Web queries are short, without query reformulation or modification, and have a simple structure.

Martin (1976) in his article “User Studies and Library Planning” discussed the user studies and appraised their role in library planning. Author provided various guidelines for conducting user studies and concluded that user data strengthens the planning and decision-making processes at several levels, so the responses of users should be an integral part of the ongoing practice of librarians, providing constant feedback. Coker (1993) has written a useful article titled “Libraries Verses Users? How and How Not to Deter Library Users”. Author examined the various factors influencing the attitude of users towards libraries and also took into consideration the socioeconomic, technological, physical/technical and psychological/ emotional conditions shaping up the perceptions of non users, inhibit users and potential users.
2.9 Conclusion

Information Technology (IT) applications in libraries had continuous growth in all respects for their development. IT has brought drastic revolution related to information and its dissemination not restricted to physical boundaries but globally. All the activities involved in all sphere of information like its creation, processing, storage, retrieval and dissemination have been dramatically changed and expanded due to fast changes and development of IT in this field. A descriptive analysis of growth of Information Technology and its development in Libraries and Information centre, its use and impact on different facet is carried out to understand these aspects in respects of the issues related to the problems. The findings reported in this study provide some useful analysis and contributions for authorities and decision makers.

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