Chapter No.2

REVIEW OF LITERATURE

2.1 Introduction

This chapter examines the literature relevant to this study. It presents an account of published and unpublished literature (books, journal articles, reports, conference / workshop proceedings, theses and dissertations) covering the different aspects of the information technology, impact of computers on libraries, library automation and its past, present and some obvious future trends, technical and practical aspects of software, library software packages and related issues regarding their impact on library science and evaluation criteria defined by many authors. Each topic is elaborated in local, national and international scenario.

2.2 Concepts

Accession: To enter in an accessions record or register particulars of each item in the order of its acquisition. (Prytherch 2000, p.5)

Authority File: A set of the records identifying a standard for established form of headings, index terms, or other items, which may be subsequently used for information retrieval, An authority file may also contain established cross-references. A thesaurus is one example of such a file. (Lal 1989, p.63)

Barcode: A code arranged in a series of parallel lines or bars, representing data that is transferred by a bar-code scanner or light pen into digital signals for computer use. (Prytherch 2000, p.59)

Boolean Search: A search for selected information, that is, information satisfying conditions that can be expressed by AND, OR and Not functions. (Parker 1984, p.203)

Compatible Software: The ability of software to be run on different computers without modification, (2) A feature that enables different application software programs to share common conventions and rules so that they can be employed together. (Lal 1989, p. 229)

Data: A general term for information; particularly used for information stored in a database (Prytherch, 2000, P. 208)
**Documentation**: Refers to the set of instructions that companies software and hardware to explain their use. Usually in manual form or for display on the CRT screen. (Lal 1989, p.345)

**Integrated Library System**: It allows the major functions of a library, acquisitions, cataloging, circulation, serials control and public access, to function from one bibliographic database. (Davis 1991, p.271)

**MARC** A MARC record is a Machine Readable Cataloging record. It means that one particular type of machine, a computer, can read and interpret the data in the cataloging record. (Library of Congress 2000, p.1)

**Module** A building block that can be used to create a large whole. In software, a subroutine can be regarded as a module, in hardware, any device that can be combined with others to create a large system. (Lal 1989, p.160)

**OPAC (Online Public Access Catalog)** It provides access to the library’s holdings via a computer monitor, replacing the traditional card catalog. May also be called a PAC/ Public Access Catalogue.

**Programming Language**: All software is written in a programming language. A programming language is a means of representing actions to be performed by the computer. Programming language is a series of codes that can be interpreted by the computer as instructions concerning the handling of data. (Rowley 1998, p.70)

**Proximity Searching** this search facility allows the user to specify the context in which a term should occur adjacent to each other, whether one or more words occur in between the search terms, whether the search terms should occur in the same paragraph irrespective of the intervening words and so on. (Chowdhury 1999, p.171)

**Range Searching** is most useful with numerical information. It is important in selecting records within certain data ranges. (Chowdhury 1999, p.173)

**Renew** To extent the period for which a book or other item is on loan; during which a library membership ticket is valid; for supplying a periodical on subscription. (Prytherch 2000, p.624)
Routing: The systematic circulation of periodicals or other printed material among the staff of a library or organization in accordance with their interests in order to keep them informed of new development. (Prytherch 2000, p.639).

Self-charging system Any system for recording book loans in which the borrower makes part or all of the record. Also known as self-issue system. (Prytherch 2000, p.660)

Shelf List A list of the books in a library, the entries being brief and arranged on cards or sheets in the order of the books on the shelves and forming, in effect, in a classified library, a subject catalogue without added entries, analytics and cross references. (Prytherch 2000, p.670)

Software: The totality of programs usable on a particular kind of computer, together with the documentation associated with a computer or program, such as manuals, diagrams and operating instructions. (Parker 1984, p.1504)

Stocktaking: The process of taking stock by checking records of items possessed with copies on the shelves and records of loans. (Prytherch 2000, p.702)

String Searching Allows one to search those terms that have not been indexed. It matches the search term character by character with the stored records. (Chowdhury 1999, p. 176).

Truncation: Allows a search to be conducted for all the different forms of a word having the common root. A number of different options are available for truncation, e.g. right truncation, left truncation and masking of letters in the middle of the word. (Choudhury 1999, p.174)

WEBPAC / Web OPAC A library OPAC made available to users via a web browser. (Prytherch 2000, p.770)

2.3 REVIEW OF LITERATURE

2.3.1 Books

Busha, C.H. and Harter, S. P.(1980) has described as, this work is upon methods of enquiry in librarianship, including design, measurements, and analysis. In addition, author intended to provide a work that could give readers better understandings of the past, present and future roles of research in library and
information science. This book will make a contribution to the establishment of systematic enquiry as a fundamental facet of the study of library science and of the practice of librarianship. Statistical analysis of quantified data is discussed in various chapters, a mathematical background is neither expected nor required of user of this book.

Nair, R.R. (1992) This book presenting computer concept from a library perspective can provide the computer literacy our library and information workers require. It can give a general understanding of the computer system, its hardware, software components and can also help to identify and define the scope of jobs in library and information systems which computers can be made to do. It also discusses in detail PASCAL which is becoming the popular computer languages among librarians, CDS/ISIS the unique software developed by UNESCO for database management in libraries and database III+ which can be used for various types of jobs in libraries.

Nair, R. Raman (1995) Academic Library Automation presents current developments and experience in the application of information technology in libraries of Universities, Colleges and other research institutions. Quality of teaching and learning in higher education, and avoiding waste of resources through duplication of research work presupposes and timely accessibility to relevant update information. But this has become difficult due to information explosion, scatter of information, complexities in its use pattern and limited resources. Automation was thus a natural consequence of the attempts to find out a meaningful solution to the long sustaining problems in academic libraries.

The new technologies have knocked down the walls of the conventional academic library by introducing online databases, CD-ROM, video disc and other exotic media. Now, Databases are accessible to user beyond the confines of national boundries. Extensive networks make possible wide geographic courage. CD-ROM technology allows the storage of large quantum of information on compact, durable and highly portable medium. This being the state of art in line library systems, institutions of higher education have to modernize their libraries if they are to meet effectively the information requirements of the academic community.

Faruqi, K.K.Ed (1997) Automation in libraries has been divided into two sections. Section A deals with the topics like Libraries, Manpower and Automation,
National automation of libraries, national serial data system, national bibliographic data base in MARC, information transfer etc. in section B several useful chapters have been added, the information of which is scantily available like history of microform activity, organization of microforms in the library, microform as library resources, advanced and goals in micro photograph, policy questions of photo duplications and many more interesting chapters.

Sehgal, R.L. (1998) has mentioned, A number of organizations have produced or are producing packages of programmes usually written in a general way for library and information work. Details of many such packages suitable for a particular application is described in detail. This book goes a step ahead and brings forth the points to be considered in view of the application and requirement which shall help the user close the best suitable software for the need of the library. In this book, some of the packages which have been developed as interacted library systems are described in detail. Some of them have been tailor made for a library or a group of libraries but are very much suitable to be used by any library.

Malavya, V.C. (1999) has outlined that. The pattern of automated library service in the future can only be predicted by educated extrapolation of the developments that are taking place in libraries today, bearing in mind other factors which will have an important bearing on libraries. Included among these will be an expected continuing exponential growth in population and the increasing the importance of libraries in the developing countries. The expansion of knowledge shows no signs of abating, and libraries will also be faced with a continuing proliferation of disciplines. Coupled with a trend towards inter-disciplinary study. The volume of publication will continue to grow but there should be an increasing recognition by central government of the importance of libraries and their functions of bibliographies control and information dissemination. The consequence of this recognition will be greater financial support for library programmes.

Vasant, N and Mudhol, M.V. (2000) Software packages for Library Automation has been divided into six chapters such as Introduction, Computer configuration, Development of software packages, Specific software packages, other important software packages and Epilogue. Each and every chapter is define about library management software packages and related terms.

Sinha, S.C.& Dhiman, A.K. (2002) This book is divided in two volumes, first volume of which covers basic aspect of research methodology describing concept of
research, Research and theory, designing of research, formulation of research and different techniques of research, data analysis, sealing technique and research report writing etc. Its second volume is devoted to applied aspects of research methodology containing chapters on different types of researches such as historical research, descriptive research and experimental methods of research, basic statistical methods and application of computers is research and application of research techniques in different fields of study.

Bilal, Dania (2002) This updated and expanded second edition offers the latest findings and practices for library automation in the 21st Century. With a practical, systematic approach, Bilal covers the entire spectrum of steps and activities involved in the automation process. Although this text does not prescribe a specific system or approach, it offers detailed guidelines to enable both the novice and the seasoned librarian to make educated decisions and avoid costly mistakes when automation for the first time, upgrading an existing system, or migrating from one automated system to another.

Kashyap, M.M. (2006) has stated that, Computer based library and information systems designing techniques is to give account of systems theory to help one to understand the process of systems analysis and design as well as design better information technology based systems in libraries; to describe the methodology for conducting systems study and to explain the use and application of systems analysis and design tools and techniques. This book is written, keeping in the mind the practicing librarians who are faced with the responsibility of evaluating library programs and procedures to identify the problem areas, that is, the situations where there are gaps or deviations between what is expected, what could or should be and find means to bridge the gaps. The second audience to whom this book is addressed is the library and information science students who may join a course in computer application in libraries, library system analysis and design or library system study and re-engineering technique and library databases design and development approach.

Kochar, R.S. and Sudarshan, K.N. (2007) Library Automation is the most authoritative text available to automated library. This book is a ready reference to the history of library automation and gives practical, essential data on technical support systems, OPAC, information retrieval systems, interlibrary lending bibliographic utilities, automation in reference and much more. Library Automation: Issues and systems presents in compact language and lucid style the fundamental issue and
aspects connected with library automation. For reader of every level of involvement, Library automation: issues and systems is comprehensive treatment of expanding technology and human inter-vention. As automation is a process that will touch every library facility to one degree of another. So this book can aid every librarian and administrator in coming terms with the issues that must be made concerning automation in library.

Singh, C.P. (2008) The present book contains scientific interpretation of various issues in the field which include – Introduction; Automation of Reference service; Library Acquisition Automation; Role of Technology; Change in Library services and their users as a system; Library Architecture and systems; Automation in Cataloguing; Library Management; problem & prospects; copyright protection and management systems; copyright and distance education; Retrieval process; Access and Plan.

Rao, A.S. and Tyagi, D (2009) The basic purpose of writing this book is to give to the reader a sound introduction to research methodology with SPSS. It is designed as a college and university reference book for researcher. In this book statistical methods for research is define and training based theory is included for using SPSS software. This book works as handbook of SPSS.


2.3.2 Doctoral Research


2.3.2 Research Articles

**Revolution of Information Technology**

Computing is now an every-day term in our language. They are referred to in the press, on TV and they appear in films and books with and without an aura of science fiction. Three resolutions took place in the world:

1. Agricultural Revolution;
2. Industrial Revolution;
3. And now the third revolution is of computerization in every sphere of life.

Japan, America, China, U.K. have got much profit out of the Revolution and they are applying the system in almost every aspect of life (Madan 1987,p.3). Trainor and Krasnewich (1992,p.16) have explained that how can a computer help people:

- Computers permit easy access to large volumes of data.
- Computers perform lengthy computations quickly and accurately.
- Computers identify relationships among large amounts of data.
- Computer-controlled devices go where people cannot.
- Computers can simulate human performance.

Malinconico, S. Michael (1977) has reviewed in this paper a case study of the project. The goal is in provide the reader with a detailed summary of the planning, design and implementation of the project along with workflow issues and digitization techniques.
S.C. Hui, A. Goh, (1996) has emphasized that, The newspaper is a very widely used medium for transmitting news and information in today's society. Some of the published information is very important and therefore required to be kept for future reference. The cutting and subsequent retrieval of newspaper articles is a tedious process. The retrieval process is also very laborious. Electronic newspaper cutting is required to replace the manual process. A library newspaper cutting system was developed at Nanyang Technological University, Singapore. The system enables librarians to cut, index and store news articles interactively. Readers can retrieve news articles via World Wide Web (WWW) browsers. Different abstract generation techniques, including location method, indicative-phrases, keyword frequency and title-keyword method, are incorporated into the retrieval interface to filter out irrelevant news articles. In this paper, different abstract generation techniques and their effectiveness as a means to generate indicative abstracts for news articles are discussed.

Buragohain (1994, p.216) has described that today; we are living in computer era evolving from the industrial/machine age to the age of electronics. Computers are performing many of the routine activities in to-day's society. Now a day we consider computer knowledge as second literacy even in the developing world. Information technology-now as vital as the air we breathe. It is limited chiefly by the imaginations of the people who program and operate the computers. Computer applications already cover a wide range of human needs and wants, so a variety of definitions of Information Technology are found. Malavya (1999) has stated that information technology is a powerful tool for enhancing societal infrastructure, revitalizing traditional industrial sectors, extending knowledge and enriching human culture.

Festschrift (2000) has assumed that, Information technology mainly comprises of reprography or micrographic technology, printing technology, computer and communication technology. Out of these, computer and communication technology have revolutionized the information scenario globally. IT media, tools, gadgets are growing and changing very fastly. Information technology industry is expanding enormously. It is having drastic impact of lifestyle of people, their way of working.

Ralston, Reilly, and Hemmendinger (2000) has beautifully discussed as, Information technology (IT) is an imprecise term frequently applied to a broad area of activities and technologies associated with the use of computers and communication,
but generally implying the application of computers to storage, retriev, processing and dissemination of data, particularly in the field of commerce. But the term is sufficiently amorphous to encompass the activities of those who design or even use any form of device used to gather, transmit, or process digital information; digital satellite and cable television, DVDs, digital telephony-even digital cameras and photocopiers.

Feather and Struges (2003) stated the electronic technologies for collecting, storing, processing and communicating information. There are two main categories; those that process information, such as computer systems; and those that disseminate information, such as telecommunication systems. The term can generally be understood to describe systems that combine both, but now a day the more accurate Information and Communication Technology (ICT) is more commonly used. Whilst Information. Technology has been the accepted term in the UK, it is not the universal term: Telematics is widely used in France and Informatics is also used elsewhere in this sense.

While analyzing the impact of information technology in Pakistan, Akbar (1993) has discussed that there is adequate base and infra structure of information technology in Pakistan. He has further explained that the country has well developed telecommunication system. About 200 cities/towns are connected with Nation Wide Dialling (NWD) System; about 70 countries are accessible on automatic International Subscribers Dialling (ISD) System. Fax facility is also available both for national and international destinations through fax PCOs in all the big cities and through private telephones. In addition the Telephone and Telegraph Department has introduced Packet Switched Public Data Network (PSPD) to provide reliable and secure data communication facility, telemail, fax service, etc. Similarly considerable numbers of libraries are equipped with microcomputers. There are about 12 S & T information centres using microcomputers.

Anwar (1991) has critically analyzed the use of information technology in Pakistan. In the light of facts and figures provided by him, he has pointed out that our politicians, policymakers, scientists and-research scholars ought to realize that we need a reasonable supply of information in order to achieve our development objectives.
Keeping in view the new challenges faced by the developing countries like Pakistan, Zakar (2000) has discussed that modern information and communication technologies have posed a serious challenge to the developing countries. If they fail to meet this challenge, they would fall further behind rather “stampeded” by the ruthless and monopolistic forces of globalization and international corporate capitalism. They (developing countries) are left with no option but to adapt new technologies to maintain their competitiveness in the global market.

**Impact of IT on Libraries: Past, Present, Future Trends**

Information technology is one of the major tools of tomorrow to shape our society and our institutions particularly our libraries. Kimber (1974, p.10) has provided two ways for measuring the state of fundamental computing technology i.e., by the size of their internal memory or central processing unit (CPU), or by the number of basic arithmetical operations that can be performed each second. According to him, the later is probably a better measure of the fundamental computing technology at any moment in time and over the past 30 years has been growing exponentially, doubling once every 1.8 years approximately. Many authors have discussed the impact of information technology on our libraries; few are quoted here.

Martin (1980) has presented a time line of computers use in libraries. She states that machines have been used in libraries for decades. Early professional literature, amusing to today's librarians, argues the merits and faults of the contraption catted the typewriter. Today's literature will undoubtedly be equally amusing to the librarians of the 21st century, as they read about our concerns with computer capabilities. According to her, in the early 1960s computer applications in libraries began to proliferate. No national standards existed; each library wrote its own programs, designed its own machine readable format and identified the areas of development most important for it. Librarians did research to support their decisions and published articles describing the computer applications in the library press. He has further explained that in the early 1970s, networking became a reality with the establishment of the Ohio College Library Center's shared cataloging system. Also, vendors of automated library systems began to flourish, these systems included circulation systems, computer output microform (COM) catalogs and security systems.
Keeping in view the impact of new technologies and latest trends in libraries, Delano (1973, p.18) has emphasized on the new role of libraries and librarians and librarians as well. He states, “If libraries and librarians don’t, something and someone else will.” He has further explained that new technologies are affecting all aspects of our lives and are forcing change in established institutions. In its traditional role of selecting, collecting and distributing information, the library faces increasing competition with interactive cable television, online information retrieval services and micro publications that are cheap, easy to read and disposable. In the light of these impacts he concludes that librarians must begin using these innovations and defining their roles in what is called the “information business”. If they don’t the learning resource centers and the technical information centers, which are being spawned specifically to capitalize on emerging technologies, may take over. Cohn and Kelsey (1997, p.9) have outlined the four basic functions of library at present.

1. Providing access to the content of local resources (e.g. books, periodicals, media, electronic resources) that is part of library’s collection.
2. Offering gateway access to remote resources (e.g. books, periodicals, media, electronic resources), including the ability to obtain copies in print and electronic formats.
3. Facilitating off-site electronic access to local and remote resources from users’ homes, offices and schools.
4. Providing access to human assistance in locating information.

According to Kochar (1997, p.75), the relationship between the library and the computer is a changing one. Computer science has been changing rapidly ever since it origins 20 years ago and now the library itself is beginning to be changed under the influence of the machine. Malavya (1999) has reviewed it as:

The decade of nineties has brought a mature spectrum of automated library system solutions to libraries of all sized and types. While these systems still may not perform every library operation and management task to suit every library, the currently offered systems that have been on the market for the last several years are stable and mature enough to provide wide-ranging current and future support to library operations and a sound underpinning to further electronic services delivery.
Martin (1980) has outlined some obvious patterns of technological development in libraries:

- Libraries will use more technological aids, at a relatively lower price. System and services will be widely available, either to individual libraries or to consortia.
- The sheer volume of bibliographic data in machine-readable form will increase rapidly. At some point, it may be necessary to adopt standards for identifying, controlling and storing bibliographic records, which exist in multiple copies and in varying quality.
- The reference database (those produced by abstracting and indexing services) will be linked to bibliographic database, allowing links among serial titles, journal articles and holding locations. The resultant system will allow a user to search a database, identify desired titles and locate the document in one step.
- Home computers will be used in libraries and the computer in the library and the home will have communication between the two.
- A balance will be found between on-line and off-line date storage (i.e. microform). This balance will become increasingly significant as databases grow, it is possible that 20% of the database will provide 80% of the use. For both economic and functional reasons, it will be necessary to use more than one storage medium.
- Kesner (1984, p.vii) has discussed that as modern society grows more complex and sophisticated, the control and efficient management of information will become an increasingly significant human activity. Advances in telecommunications and computer technology has fostered this trend. Gennaro (1987) has beautifully discussed the impact of the information technology on libraries in future.

I think about the revolutions in technology that are coming in the years ahead. I am confident that libraries and librarians are going to survive and that they will continue to bear their traditional names and carry out their traditional functions-to select, organize, preserve and provide access to the records of human knowledge in whatever form they take. And increasingly, the form of those records will be electronic, as will the means for performing library functions.
Malavya (1999, p.15) has assumed that libraries can be significant agencies for societal change in future. According to him the library can be a significant motivating factor if it can reach youth, particularly youth who are not receiving motivation and good role models in the home environment, as they are more likely to drop out to street and gang life and into the maelstrom of crime and violence so prevalent today. One way do this is to bring the computer to these populations. Festschrift (2000) has also discussed in detail the impact of information technology.

Although, computer-based information systems are well established, three exciting possibilities may lead to drastic changes. The first is cheap, mass storage using optical techniques, particularly CD-ROM. The second is the further development of retrieval system incorporating “export” techniques. Thirdly, users may be able to explore the possibilities of searching large quantities of information afforded by more sophisticated techniques, with the ability to use several different systems from any one terminals. This may include transfer from general to specialist systems and from system, Which retrieve surrogates through those which enable passages in texts to be found, and from systems, which retrieve bibliographic references to those, which enable information (knowledge) to be found without references to other sources.

Keeping in view the revolution of computer and its impact on libraries, Jalibi (1988, pp.vi.vii) has discussed that the subject of computer technology has been actively engaging the attention of the libraries throughout the world since mid 1960s. The successful use of this technology over these years, in bibliographical control of widely dispersed materials and more importantly in providing on-line access, in bibliographical control of widely dispersed materials and more importantly in providing on-line access, both to the resources and services of libraries in one’s own country and those across the boundaries of cultures, has also attracted attention of our library planners for using this technology in libraries of Pakistan as well. Khalid (1998) has mentioned that the limited amount of materials is available on the current situation for the use of technology in libraries of Pakistan. According to him, a few articles for example Anwar (1993), Attaullah (1994) and Rehman (1993) have been published, focusing on the application of technology in libraries. He has further discussed that the use of information technology by majority of the libraries is not for supporting their routine library activities Contrarily, he has mentioned the names of
some libraries, which are using activities Contrarily, he has mentioned the named of some libraries, which are using this technology for the provision of good services. Sangi (2002) has emphasized that information technology is undoubtedly emerging as a promising discipline for the 21st century.

Manjunatha & Shivalingaiah (2003, pp.85-90) has pointed out that, Libraries need to understand the dynamics of service delivery in IT driven world and need to strike a balance between print and electronic resources. In this article the authors discuss information formats and types, information access process and problems of information access in developing countries. An Information Access Model integrating print and electronic resources is also proposed.

Constantine and Kemparaju (2003, pp.110-114) has discusses the challenges posed by the accelerating pace of change in the world of information especially in developing countries and stresses the importance of managing the change by focusing on collection development (inclusive of electronic resources), training and development skills of the information professionals and also library users.

Kumar, Anil and Kaur, Paramjit (2004, pp.229-242) has revealed that, the base of Radio Frequency Identification (RFID) was established in the 1940s. In this paper the components and technical features of a modern RFID library system are described to provide guidelines for the evaluation of different systems. It also briefs about tentative cost of implementing RFID system in a library and how it functions and describes the role of librarians. Also discusses the advantages and disadvantages of RFID system in libraries. Prem Singh (2004) definition, importance, advantages and disadvantages of the database approach have been discussed. There are four main sources – Shelf List, Books and other Reading material, Data Sheets and international utilities such as OCLC. The author of this paper found in-house data entry fastest, reliable and cheapest. Having created the database, its management is also essential. There is, therefore, a need for Database Administrator in each library.

Sen, B.K. (2004, pp.133-136) has explained that, While cataloguing a multi-authored publication according to AACR II, the names of second author onwards are dropped in case there are more than three authors (two authors in the case of CCC) responsible for the book. The same is the case with the collaborators. It is argued that in the changed context brought about by information technology, there is no need to
drop any of the authors/collaborators responsible for the book. Inclusion of all the authors/collaborators in the catalogue will ensure giving credit to all of them.

Timothy Collinson and Alison Williams (2004, pp.137-143) has critically analysed the much time and effort has been devoted to designing and developing library Web sites that are easy to navigate by both new students and experienced researchers. The aim was to provide students with a different way to explore and discover the wide range of information resources available by taking a less formal approach to navigation based on the metaphor of physical space and playful exploration.

Dennison, Karen (2005, p23-27) has presents information about the virtual reference services at Louisiana State University (LSU) Libraries in Louisiana. Virtual reference is also known as electronic, digital, online, interactive and real-time reference, virtual reference provides information to patrons via the Internet. Implementing a successful virtual reference service begins with marketing it to potential users. The Live Assistance logo alternates on the LSU Libraries' homepage at www.lib.lsu.edu among several other images which publicize new databases, special events and library news. The LSU Libraries focused marketing efforts via the campus newspaper entitled, "The Reveille," and the campus radio station 'KLSU 91.3.' The power of word-of-mouth is the most important avenue for conveying information on a college campus. Staff members at LSU Libraries provide the virtual reference service at his/her own desk. One very important area of training is effective communication in the online environment. Each library will face unique challenges in establishing and maintaining a virtual reference service at their institution.

Greever and Andreadis (2006, p.45-54) has analysed that, Kenyon College and Denison University are combining technical services departments to enable the libraries to capitalize on the expertise available across staffs and achieve an efficiency of scale not typically possible in a single, small library. This process is in the early stages of implementation. Here the authors describe the process of planning for and beginning implementation of the redesign.

Husain & Ansari (2007, pp.34-38) has described as, Introduction of computers in libraries has immensely enhanced the effectiveness of library services including efficient organization and retrieval of information activities. Since the application of information technology in libraries, one of the greatest challenges before the library managers is the selection of a good library automation software
package which can cater to the needs of a particular library. The present article discusses the salient features of cataloguing module of three such packages, namely, Alice for Windows, Libsys and Virtua and their acceptability in a developing nation.

Manjunath & Pujar (2009, pp.255-261) has revealed that, Automation is still not widely used in libraries in India. This paper discusses the benefits of barcode technology and gives guidelines for selecting the hardware/softwares highlighting the features of scanners and printers. The paper also gives guidelines for retrospective conversion, which becomes the core issue in any library with a very large collection. Some tips necessary for software customization have also been provided. This paper is a case study based on the barcoding and retrospective conversion project undertaken at IGIDR Library, Mumbai, India.

Ahuja, Jayasree (2008, pp.129-142) has briefly discusses each of these fundamental aspects and suggests an alternative knowledge organization and information retrieval tool based on basic and advanced ‘human needs’.

Tega & Baro (2008 pp.19-26) has search that, the patterns of information storage and retrieval in Nigerian university libraries. The findings of the research revealed that storage and retrieval devices such as computer hard disks, audio-tapes, video-tapes, video-players, television, Internet, Xerox, database management systems, microforms, CD-ROM, worm-disk, magnetic-optical disk, magnetic tapes, flat files, memory cards and many others are the various patterns through which information/data can be stored and retrieved in Nigerian university libraries. This research and its findings will assist Nigerian university libraries and beyond to know how best to care for their information/data storage and retrieval, and ensure that adequate facilities are provided and experts/librarians are trained in such contexts, so as to meet changing trends in the world and in order to satisfy users’ information needs. Mishra & Kumar (2008) has defined the advent of CD-ROM technology has made profound impact on library services with its unique features of large storage capacity and iterative search facility. The P K Kelkar Library of IIT Kanpur had started procuring CD-ROMs and other multimedia resources to overcome the ever growing need of space, as also to provide fast and iterative search facility to its user since 1990s. The purpose of this paper is to describe the processes involved in managing the CD-ROM collection at P. K. Kelkar Library. The paper also discusses the importance of CD-ROM in relation to de-stressing library collection. It outlines the planning and processes involved in organizing CD-ROM collection on shelves
and development of a user interface through open-source software, i.e. Winisis and GenisisWeb.

Rajput & Naidu (2008, pp.55-62) mentioned that, Libraries have started using advanced information technology in providing services to the users. Online Public Access Catalogue is one of the services that to being provided by the Devi Ahilya University Library. The present study is an attempt to know the use of Online Access Catalogue by the users. The study revealed that the tool is useful and at the same time respondents felt that there must be someone near the OPAC to help in retrieving the required documents. Examines the utilization and satisfaction of users about OPAC and highlights the suggestions made by the users for the further improvement.

Bruce & Stephen (2008, pp.661-671) has situates the teaching of business strategy and information strategy in a historical context and combines this with a reflection on teaching the subject in practice. Findings – The paper finds that there is a need for exchange of perspectives and skills between information science and information management students which can be mutually beneficial and add value to their skill set. Practical implications – In terms of curriculum design for information professional education, information systems students need a strong background in the business and user environment to leverage the technologies for business value. Originality/value – The paper presents a case study of practice with a commentary on the dynamics of teaching the theme.

Hee-Yoon & Sun-Kyung (2008, pp.265-282) has reported and to offer some considerations for the implementation of hub-based collaborative repositories. The current situation of Korean public libraries is to be examined. Findings – By the end of 2005 Korean public libraries as a whole had reached 92 percent capacity, which suggests that there is an immediate need to secure additional storage space. This paper proposes the establishment of collaborative repositories, borrowing the principle of selection and concentration. The model for hub-based collaborative repositories is provided and the roles of the repository network are outlined. This will effectively increase the circulation turnover rate while reducing a user's opportunity costs. In the meantime, the National Library will be contributing to the country's decentralization and balanced national development and also increasing its own value.

Hane, Paula J. (2008, p.7-13) presents news briefs from the information technology services industry for November, 2008. Pilotprograms at Penn State University and Caritas College in Ireland are evaluating the use of digital text readers
from Sony Corp. and IRex Technologies, Inc. Several search products are described, including an enterprise search appliance from Google Inc. and a product line from search company Exalead. The author notes implementations of library automation software from Equinox Software Inc.

Fiehn, Barbara (2009, p.28-31) has revisits her research on the Web 2.0 tools used in school library automation in the U.S. She explores a number of social networking possibilities such as book reviewing, ratings and recommending purchases. She also indicates the growing interest of school library media specialists in using the social networking features in their automation systems.

Holmberg, Kim and Other (2009, pp.30-31) to define both theoretically and empirically the concept of Library 2.0. A comprehensive model enables both researchers and practitioners to frame the phenomenon more clearly, evaluate existing and planned services and their proximity to what is Library 2.0. Originality/value - Unlike earlier proposals for a definition of the notion Library 2.0, the present study presents an empirical and consensual crowd-sourcing approach of defining the concept Library 2.0 and provides basis for discussing the future evolution of the notion and its implications for library and information science research and library practices.

Kumar, B.&Biradar (2010, pp. 182-193) to examine the use of information communication technology (ICT) in 31 college libraries in Karnataka. Findings - Application of ICT in Indian college libraries has not reached a very high level. Lack of budget, lack of manpower, lack of skilled staff and lack of training are the main constraints for not automating library activities. Even though library professionals have shown a positive attitude towards the use of ICT applications and library automation, they need extensive and appropriate training to make use of ICT tools. Originality/value - This is a comprehensive study on the use of ICT in Indian college libraries. Its findings should help college librarians, local government and also the University Grants Commission, New Delhi.

Mondal & Bandyopadhyay (2010,pp.20-21) has searched that, Application of information and communication technologies in academic institutions in West Bengal has increased in the recent years. But the computerisation work of general degree college libraries of Burdwan Sadar (North and South) is very slow due to certain problems. Trained manpower is one of the major problems. This paper
examines the situation of IT application and related manpower problems in government-aided general degree college libraries of Burdwan Sadar (North and South), West Bengal. Pal (2011, p12-20) discusses the concept of data mining that has emerged as a technique of discovering new meaning in data implicit in a large data warehouse, in order to facilitate better strategies and smart decisions. The standard tasks involved in data mining process are explained. Draws attention to useful applications of data mining in varying degrees and illustrates the benefit of this powerful technology with several instances of providing solutions to challenging problems. Also focuses on bibliomining opportunities to be useful to information retrieval, semantic analysis of unstructured texts, web-usage mining and to make proactive as well as knowledge-driven decision across library services; that help researchers in linking information for novel discovery and insight. The discussion illuminates the wrong things that happen with data mining applications and cautionary tales for avoiding serious consequences. Suggests use of data mining in combination with other techniques of evaluation, exploiting large data warehouses by skilled specialists, and advises for ethical uses without privacy invasion.

Meera, Meera (2010, pp.228-236) has presents, the human resource development (HRD) aspect of the libraries in the present digital environment. Discusses the need and challenges of and the areas of training like Computer technology Library technologies, Communication technologies, Technical communication technologies, and Reprographic technologies required for the Library and Information professionals (LIPs) in present day.

Eden, Bradford Lee (2010, pp. 61-67) has presents, the changing role of technical services departments in libraries during the information age. Differences between catalog librarians and metadata librarians or specialists are examined and the expectations of library users, the usefulness of library catalogs and integrated library systems (ILS), and the impact of the WorldCat Local search engine are explored. Challenges faced by technical services departments and staff members are discussed and limitations created by traditional library workflows are examined.

Sornam, Ally (2011, pp.625-640) stated that, Workplace stress has always been a source of consideration for organization that seeks to foster satisfied and motivated environment. Ergonomics, the science related to man and his work helps to design workstations and tools. The present study has made an attempt to identify the impact of ergonomics on academic library professionals. It has revealed that academic library
professionals' perception on ergonomics is low. But they have shown problems associated with ergonomics with regard to IT tools, working posture, etc.

**Library Automation**

Fayen, E.G. (1984, p.59) reviews the history of library automation before discussing factors that libraries should consider before choosing to go online (collection size, machine-readable database, computer equipment, costs), and features of online catalogs (database organization, search features, authority files, display options). Information about selected online catalog systems is provided.

Peruginelli, S (1990, pp.446-460) has discussed that, To automate the library process including the use of MARC tapes. The most extensively automated procedures in Italian libraries are identified as involving cataloging, internal lending, acquisitions, and serials. The National Library Service is described. Applications software development on SBN system prototypes on IBM hardware are examined. Pace, Andrew K. and American Libraries (2007) also traces the history of library automation in the U.S. In 1968, Input Services was converting library catalog cards to magnetic tape with an optical page scanner. By 1977, the library knowledge base was growing. F.W. Faxon was offering customers a journal price, history database called SCOPE. In 1977, Library Interface Systems was converting those records to LC MARC 11, greatly reducing staff time. Pace, Andrew (2006) stated that, Less than a decade into the 21st century, perhaps it is more fitting to describe library automation as approaching its 80th birthday, is a time to look back and carefully measure moving forward. Since the introduction of a punch card circulation system at the University of Texas in 1936, through the advent and perseverance of the MARC record, and following the ebb and flow of nearly 75 different library automation vendors, library automation has come a long way.

Bolin, M. K. (1993, p79-94) has claimed that, The history of library automation in Idaho is illustrative of the course of library automation throughout the United States. Idaho’s effort to automate its libraries is the story of cooperative ventures designed to help libraries work together to further their own interest. The role of LSCA, the Idaho State Library, the geography, and other unique characteristics of the state, as well as the role of WLN, are examined.

Khurshid, Z (1996, pp.23-28) describe a brief history of library automation and the implementation of DOBIS/LIBIS at the King Fahd University of Petroleum and
Minerals Library. It also discusses the management aspects of the automation project including the composition of the project management teams, the roles of the Project Manager and the Library Systems Analyst and the relationship between the Library and the Data Processing Center as two major partners of the project. The paper also highlights the limitation of the Systems Office in the absence of full-time staff and suggests that library automation must be managed just as other activities are managed.

David Roberts & Souter (2000, pp.384-401) discusses the possibility of the automation of sophisticated subject indexing of medical journal articles. Approaches to subject descriptor assignment in information retrieval research are usually either based upon the manual descriptors in the database or generation of search parameters from the text of the article. Use of the Unified Medical Language System (UMLS) for identification of controlled vocabulary descriptors. Coordination of descriptors, utilising features of the Medline indexing system. The emphasis should be on system manipulation of data, based upon input, available resources and specifically designed rules.

Gihan P.& Amaraweera (2002, pp. 111-116) outlines the historical background to the use of computers for library automation in Sri Lanka with special emphasis on the use of CDS/ISIS. Describes the implementation of a prototype low-cost web-based library automation system as a solution to the information management problems in Sri Lankan libraries.

Ramana (2004,p.8) is presented in this study, A simple Library Automation Software for school libraries, which was developed and successfully implemented at the Mariampur Senior Secondary School. Primarily due to the negligence of the school administrative authorities in recruiting qualified and competent library staff, the use of the library automation software was discontinued. The educational institutes should motivate the library staff to improve their qualifications and provide them enough incentives to Rain working knowledge of computers and endeavour to improve their libraries through the use of computers.

Fiehn, Barbara (2004, pp.20- 25) Presents the result of a 2004 survey of school library media professionals about the use of library automation software in the U.S. Importance of library automation; Information on user groups which provide a means of training and support on system developments; Features of an automation system.

Sanni and Idiodi (2004, pp 153-155) has outline of the history of automation in academic libraries in Nigeria. It tries to enunciate the conditions necessary for
computerisation as well as the criteria for choosing software in Nigerian libraries. The paper also describes ongoing computerisation of library operations at the John Harris Library, University of Benin. The software of choice is SLAM -- Strategic Library Automation Management. which is developed by a local library systems consultant and runs on the Oracle DBMS platform. The paper reviews the different modules of the software, and its advantages over other library automation software.

Crawford & Brown (2007, pp.267-273) Outlines the content of the Seminar on the History of Library Automation held in 2006, organized by John Crawford on behalf of the Library and Information History Group (UK), out of which this special issue of 'Library History' arises. Provides an overview of the seminar and abstracts of the papers presented.

Hopkinson, Alan (2009, pp.304-312) stated that, Library automation has developed in the industrialized world over the last 25 years and progress in developing countries cannot be separated from trends worldwide. There is also the possibility to develop one’s own system. Nigeria, Thailand and India are taken as case studies, illustrating different kinds of solutions that are available and various pitfalls. Predictions into the future are difficult. Internet bandwidth will improve in developing countries and open source may prove useful but economics may not improve and power supply problems are likely to remain.

Breeding, Marshall (2009, pp.55-64) has mentioned as, In the upcoming years, we anticipate major changes in the realm of library automation. The upheavals have begun, with many different movements challenging the models of library automation that have prevailed for decades. Sparked by recent industry events, libraries demand openness at a higher level than ever before, expressed through a tsunami of activity in the adoption of open source library automation software and in demands for open access to library data to enable better local control and integration with third party products. Specialists in serials need to be aware of, and provide input into, the emerging visions of library automation.

Breeding, Marshall (2009, p.3) discusses the use of automation software by libraries. The library automation environment favors systems that can deliver, in one way or another, products that allow libraries more liberal access to their data. Open source software is not the only approach possible as libraries seek options to gain more access and control over their data and other aspects of their technology environment. The Z39.50 Machine-Readable Cataloging (MARC) protocol provides a
standard approach for search and retrieval for information systems and has been very effective as the basis for library applications. AUTOMATION AIDS (2004) This article presents news briefs on library automation aids as of November 2004. The integration ensures single sign-on access to multiple resources, providing end users with institutional authorization for federated searching and access to citations or full-text records. Sirsi Corp. announced that it and electronic-book-provider BWI have completed the integration of electronic-books with an intelligent library system and with online library catalogs. SydneyPLUS International announced the inclusion of embedded Z39.50 search-and-retrieval-capabilities into its knowledge management and library automation software.

Chandrakar & Arora (2009, pp.1-12) discusses the library automation and the present higher education system in India. An overview of the history of higher education in the country is offered. It states that the most popular library automation systems used in the country includes INFLIBNET Centre, SOUL 2.0 software, digital library consortium and the National Knowledge Commission (NKC). It mentions that changes happening in the education sector are helping libraries and professionals with benefits.

Hasegawa, Toyohiro (2009, pp.1-27) presents as, The librarians discussed issues such as their impressions, effects, and the future of library automation. Regarding the effects and problems of library automation, the study found the following three points: (1) promoting labor-saving and functional advancements, (2) libraries losing their power, and (3) imperfect packages.

Khan & Mahmood, Khalid (2010, pp. 135-142) research on library automation in Pakistan.. A survey of library users and librarians in Pakistan was conducted. Findings indicate an overall level of satisfaction with services offered by PakLAG, particularly its training programs in the use of information technology.

Rao, Srinivasa & Choudhury (2010, pp.1-10) presents, an empirical study on the factors influencing the provision of networked information services in India. Brief information is given about research on the use of networked services (NS) and electronic journals in academic libraries. The conclusion is that most Indian academic libraries are in a transitional stage of providing NS.

**Importance of Library Automation**

Francois (1964, p.158) has emphasized that how the automation is becoming very important in the coming future. According to him, there is no hold back the
future. The stage already has been set and the curtains have parted to reveal glimpses of the new era. The only thing that can be changed is the ending. If we drift aimlessly and supinely though the age of automation, then there can only be an ending steeped in chaos and disorder. While discussing the reasons and importance of library automation, Kimber (1974, p.21) has pointed out that automating a library is not going to change all this in a dramatic way, but in a very real sense computer-based library systems have the ability to monitor and report on their operation in a way that no manual system ever can. They can provide the librarian with information of a kind never possible before. He can use this to optimize the working of his systems, to assist in forward planning, to study the behavior of his users and possibly also as data from which theoretical models of library operations can be derived. Lovecy (1984, pp.1-2) has also discussed the importance of library automation in these words.

Library automation is a major undertaking. Which requires a positive operational justification, an examination of the pros and cons and a realization that it will, in the course of time, change the whole nature and approach of the library. Whether that change will be for the better or worse will depend on three things, how the introduction was undertaken, how reasonable were the original projections of what could be accomplished by the use of the computer, and how realistic were the objectives in library terms.

Meghabghab (1997, p.5) has stated that every library, regardless of the type and the size of its collection, benefits from automation. What is most evident about automation is that it improves library services and increases productivity, efficiency and accuracy in perforating a variety of library operation.

Library Management Software Packages:

Library Software is the key to library automation. The understanding of term software is of significant importance to be acquainted with the concept of Integrated Library Software and its different features.

The term hardware denotes the equipment components in a computer system. The term software donotes the programs, or predefined sequences of instructions, which a computer executes to accomplish a given information-processing task. According to saffady (1989, p.51), the hardware components in a computer system are visible, tangible and readily comprehensible; software, on the other hand, is a
conceptual entity–an intellectual product. It does however, have a tangible manifestation; the individual instruction that make up a computer program are customarily written on paper in the more or less human-readable form. While explaining the technical aspects of software, Rawley (1998) has stated that all the software is written in a programming language. A programming language is means of representing actions to be performed by the computer. He has mentioned that there are at least three kinds of programming language:

- Machine code which computer understand but people do not (without help)
- High-level languages which people understand but computer do not (without help)
- Assembly code- which lies somewhere between machine code and high level languages

He has further mentioned some programming languages as Algol (Algorithmic Language); BASIC; QBASIC; VBasic; COBOL; Fortran; Pascal; Turbo Pascal; PL/I; LISP; PROLOG; C and C++ MODULA3; java; VRML; etc (pp. 70-72).

According to Riaz (1991, p.37), the basic approach to develop and execute application software is very much similar for all types referred to as an algorithm. An algorithm may be defined as a finite sequence of instructions to solve a problem. It is like a formula or recipe, in that its application will always produce an identical result if it is followed precisely. An algorithm is always developed by the programmer to solve a specific problem at hand and that in turn is used for developing a computer programme.

SATELLITE EVENTS (1994) The article presents information on some special events related to information science. Each year the Electronic Publishing Seminar addresses key areas of current interest to electronic publishers and those about to become involved in electronic information products. Basics of library automation will be reviewed with practical pointers on how to select the systems and services best for certain situation. It also reports on a new seminar on marketing electronic information products and services; the seminar provides practical, current information about marketing electronic information products, including online, CD-ROM, and site licenses.

Keeping a look at the trace of development of software through the last 40 years. Festschrift (2000, p.22) has revealed that in first generation computers, the programmer gave data and instructions in machine language. ‘First generation
computers’ used switches and wires-plus boards to implement programming. Later came stored-program concept and computer named EDVAC was built which had its program stored in the computer memory and these programs could be changed easily. According to him. John Von Neumann gave this idea of stored program. With the advent of transistors in the ‘second generation’, the parallel development in software also took place. ‘Assembly language’ was developed, which made the programmer’s job easier as this language used mnemonic operation codes instead of machine language instructions, which were to be given in strings of zeros and ones. As many software packages are available to meet the users’ needs Rowley (1998) has explained what is meant by software packages. According to him, a software package is a suite of programs that are packages together because they perform a specific function. The concept of a software package sits more comfortably in a commercial environment, where software is packages and sold. In house suites of software program may be under continuing evolution and it may be difficult to identify the boundaries of such a suite. He has mentioned three different types of software packages: a) Operating system; b) Utility software; c) Application software. 

Tedd(1984,pp.145-165) has named few famous library software packages. i.e., Claremont College’s Total Library System (TLS), Dobis/LIBIS, European University Institute (EUI), ILS-Integrated Library system, Maggie’s Place, Newwave, NOTIS, Virginia Tech System (VTLS).

Nyren, Karl (1986, p.21) reports on the reaction of the U.S. federal libraries to the On-line Computer Library Center's (OCLC) decision to abandon its 'Acquisitions Online Subsystem' library automation software which was being used by the former. Libraries' argument regarding the obligation of OCLC towards them; Difficulty faced by libraries in investing in a different acquisition program; Appeals of libraries to OCLC for reconsideration of its plans.

Mandelbaum (1992, pp.12-13) has suggested that, in the selection of special purpose library software, there are following options open to the librarians.

- Development of an in house system
- Purchase of a turnkey system (hardware and software supplied by the one vendor)
- Purchase of a prewritten library specific software
- Purchase of a general purpose software package
• Contracting with an existing bibliographic network
• Forming a consortium for the purposes of automation and
• Making use of existing computer system and staff of a parent organization.

United states (1992, p.205) has presented a report, which examines the rapid and complex technological changes and trends in computer software and their possible effects. The report reveals that European producers have long faced competition for U.S. firms; they now face increased competition from Japanese firms positioning themselves in Europe in anticipation of the single European market. At the same time, the European software market is growing rapidly and packaged software-long U.S. strength-is becoming more popular. European research in computing is fragmented; marked unification is expected to permit more integrated research in information and telecommunication technologies. Japanese firms are positioning themselves for rapid expansion in the United states, Europe and Asia. Japanese computing research emphasizes massively parallel and distributed computing, optical computing, neural nets and applications of fuzzy logic; software areas receiving attention include supercomputer software and graphical-display software for use in simulation and animation. The Japanese approach for display software for use in simulation and animation. The Japanese approach for “manufacturing” software has received much attention. Custom software currently dominates the Japanese market but some consider that Japanese “software factories” can extend Japan’s advantage in quality “embedded” software to packaged software as well. According to the report analysis, Taiwan and Singapore are both developing information technology industries. During 1998s, a number of government measures facilitated development of Taiwan’s microcomputer industry; the government is now focusing on nurturing a software industry. Over the past decade, Singapore has actively pursued a national goal of developing a software and services industry. It is now targeting strategic computing technologies like commercial applications of expert systems, neural nets and fuzzy logic.

Chachra & Gulbenkian (1994, pp.18& 5) mentioned overview of VTLS with respect to its library automation software, as well as history, products, services, special interests, clients, and vision for the future. Optional packages and specialized software options are also listed. Several sidebars focus on particular products, with graphics.
Rogers, Michael (1994, p.32) States that the Swiss National Library in Bern is the eighth national library to automate with VTLS integrated library automation software. VTLS contracts with Universidad Autonoma de Nuevo Leon in Monteray and United Arab Emirates University; Contact point for more information.


Webbm Donna (1996, p.61) Focuses on the Minnesota State Colleges and Universities/Project for Automated Library Systems’ (MnSCU/PALS) use of a system that combines the elements of an on-line network, the PALS library automation software and a document delivery service to help meet the challenges. Delivery of interlibrary loan items by the MINITEX courier system.

Saffady (1999, p.209) has defined that an integrated library system, variously termed an “integrated online library system” (IOLS) or simply an “integrated system”, is a computer-based information system that uses a single bibliographic database and a set of interrelated application programs to automate multiple library applications. According to pandey (2000, p.229), an integrated library automation system is almost a necessity in library. Considerable economies are achieved if all parts of library operations are consolidated within one software system so that manual files are not needed, communication between departments is facilitated through an examples that consider the flow of materials into a library. When an order is placed for a book, the first skeleton of bibliographic record is augmented in the cataloging process, barcode identification is attached and the item is made ready to circulate. Three system are involved. acquisitions, online catalog and circulation.

According to Gopal (2000, pp.207 & 38), an integrated library automation system is almost a necessity in a library. Considerable economics are achieved if all parts of library operations are consolidated within a software system so that manual
files are not needed and control is facilitated through an integrated database. Functionality is improved and control is facilitated. Through a survey regarding the administration and management of integrated library system is no small task. It involves a multitude of individuals and oversight and functional comities working together to make it successful. While describing the concept of integrated library systems, Genaway (1984) has outlined the historical development of this concept. According to him, historically, each automated library has built its own local at its own location. As interfaced and linkages between different library system become more available, access to an individual library’s holdings will become easier for other libraries. In the past, too, libraries have been nicely compartmentalized with separate sections for acquiring, processing and retrieving items. When automation has occurred, with exceptions it has been limited to a given department or section, such as acquisitions or circulation. Earlier computer capabilities just did not seem to allow for it to happen any other way. Keeping an eye on present trends as well, he has further explained that presently, there is a clear trend away from automation bits and pieces or single sub systems toward integrated systems in which all sub system (acquisitions, cataloging, circulation, etc.) are interrelated and share a common database. Genaway has discussed that how the costs of the software are increasing day by day. He explains that hardware costs are generally coming down. either in terms of the price of the equipment itself or in terms of the increased capabilities available for the same price. While comparing the prices of software with hardware, he has presented some facts and figures of last few years. He states that on the other hand, software costs are going up VTLS marketed its software for $10,000 in 1980. As of 1984 it was charging $60,000. There is a reason for this increase, Software is labor-intensive and labor is costly, especially for programmers and systems analysts who presently command a premium wage. In order to be responsive to customer needs, new features and modules must be continually added. Authority control, Boolean search capability, etc take time and personnel to develop and maintain.


Surpass Software Unveils Central 2.0 Library Automation Software. (2000, p.59)Reports on the release of Surpass Central 2.0 from Surpass Software's line of library automation products. Features of Surpass Central 2.0, including the ability of
Accelerated Reader users to import student photos from Lifetouch Administrator's compact disc (CD); Ability of users of Surpass Safari to perform specific searches.

Cox and Mackey (2000, p.51) described the features of various software products for library management. Check Point Intelligent Library System; MITINET/MARC cataloging software; Athena 7.1 library automation software. Ernst, Carolyn and EContent (2000) outlined that, In designing a digital library, no decision is more important than the selection of software, since to the user, the software represents both the catalog and the traditional bookshelves. It must be easy to use, and it must be effective. Describes a wide range of questions to be considered in the software selection process, and outlines a strategy for making decisions about which software to choose. Includes references to directories of library automation software available on the Web, as well as a digital library software comparison chart.

PRODUCTS AND SERVICES BY BRAND NAME. (2000) Presents a list of brand name computer-related products and services for use in library management and automation. Details of integrated library automation software, electronic subscription services, databases, computer hardware and furniture, books, and other products.

Agarwal D & Gupta R. (2001, pp.39-44) an attempt has been made towards the critical appraisal of managing serials through the library management software, LIBSYS. Singh Prem (2005) emphasized that, LibSys is a library management system with five modules - Acquisition System, Cataloguing System, Circulation System, Serials System and OPAC. This system was implemented in the Library of CCS Haryana Agricultural University, Hisar, India about 4½ years back. It is available for single-user as well as multi-user environments for libraries with limited as well as unlimited collections. It can be implemented on almost all the popular hardware and software technologies.


Singh Anil, (2001, pp.45-52) presents an overview of Prasad Automated Library Management Systems (PALMS) package. The package has several attributes and is very simple in its operations. It provides easy access and management of records through its search, edit, append and storage facilities. So, it would go a long way in helping its clients and managers.

Sinnarkar S N (2003, pp. 153-155) has searched that, A citation database of scientists belonging to National Environmental Engineering Research Institute has been developed in CDS-ISIS for the creation of an institutional database of citations. The study suggests that creation of such institutional databases can be a step towards the creation of an ICSC Idahosa. Patricia Okiemute (2001) describe the need for library automation in Nigeria was informed by the need to improve library service to users, to make the library more user-friendly, and to evolve with international trends. Presents an overview of the features of CDS/ISIS, explains its development, and describes the experience of the Lagos Business School in its implementation of the software.  Debarman, Susovan (2006, pp.219-228) This article briefly describes the preparation of a bibliographic database for Indian patents using CDS/ISIS software for MS Windows, which is developed and distributed free of cost by UNESCO. The steps in the preparation of the Field Definition Table, Data Entry Work Sheet, Print/Display Format and Field Selection Table (indexing and sorting parameters) for the database are described. ICSC, Srinagar (J&K), India- The purpose of this paper is to share the experience of automating a college library in one of the smallest states of India having limited staff and resources. The study is based on the experience of the Islamia College of Science and Commerce, Srinagar library in implementing automation with the use of CDS/ISIS and SOUL software. The case study will be useful for libraries planning automation in the country having limited staff and finances. It shows that automation could be initiated with limited infrastructure and staff provided the staff is enthusiastic.

Kahn, Charle (2005, p.37) Reviews the library automation software Library 4 Universal from Kelowna Software Ltd

Chetana and Devi (2005, pp.251-264) presents an overview of information retrieval in Indian languages is a crucial issue. This paper presents an overview of the key issues in information retrieval in Indian languages and guidelines to retrieve the needed information in any Indian language based on the experience at CIIL Library in using VIRTUA - a library automation software package, with UNICODE support.

KENOSHA PUBLIC SELECTS VUBIS SMART (2006) reports that, the public library in Kenosha, Wisconsin has opted to purchase the Vubis Smart library automation system which is provided by Infor Library Solutions (formerly Geac Library Solutions). Vubis Smart provides software for the library's online public access catalog; circulation, acquisition and cataloging functions; and report writing. The system will replace their Geac ADVANCE system which can no longer sustain the upgrades necessary to support a large, modern public library.

Whitaker, Becki (2007, pp.77-81) announces that, the Indiana Cooperative Library Services Authority's (INCOLSA) Indiana Shared Library Catalog (ISLC) is migrating to LibLime's Koha ZOOM solution for their next integrated library system (ILS) and union catalog. The solution will offer ISLC membership with a shared integrated library automation system. The move is the first step in a partnership between INCOLSA and LibLime to provide open source automation solutions to INCOLSA's 768 member libraries. According to Becki Whitaker, Director of Professional Development at INCOLSA, LibLime helps minimize the learning curve of the staff. L LibLime LAUNCHES "KOHA WITH CLASS" INITIATIVE (2007) The article announces the launch of the "Koha with Class" initiative from LibLime, a developer and promoter of open-source solutions for libraries. LibLime's technology president Joshua Ferraro explains that next-generation librarians need to understand integrated library systems (ILS) in order to make sound technology decisions, and open source ILS provides a chance for them to do so.

Guhlín, Miguel (2007, pp.16-21) discusses the impact of open source software on education. Open source software is capable of facilitating school-community relations by allowing students, parents, teachers, and administrators to exchange electronic documents such as blogs, wikis, and library automation systems. Educators and students are likely to benefit from open source alternatives by giving them the opportunity to view, alter, redistribute the source code. It has been noted that open source software is similar in idea to that of free software but slightly less rigid than the free software movement.

Breeding, Marshall (2007, pp.38-41) discusses several issues regarding the Horizon integrated library system (ILS). On March 13, 2007, SirsiDynix announced that it had discontinued development of Horizon and would consolidate its future ILS
efforts on Unicorn. The library automation system, originally called Marquis, made its
debut at a meeting of American Library Association (ALA) in January 1991. It was
the first automation system designed from its inception to follow the client/server
architecture that had emerged by the late 1980s.

Fox, Beth (2008, pp. 22-23) focuses on the creation of a community library
automation system at the Westbank Community Library in Austin, Texas. The
library's first automation system has faced deficiencies that limits the library's ability
to provide desirable services. However, Alexander Charbonnet who first volunteered
and finally hired by the library created the Apollo, the new integrated library system
developed for public libraries.

Husain and Ansari (2008, p. 3) evaluates three important library software
packages. The importance of knowing the various search facilities available on a
range of software packages, on a comparative basis, cannot be overemphasised. This
study concerns with laying the foundation for such exercise. With the application of
information technology in libraries, selection of an appropriate library automation
software package has become a challenge for the library administrators. Online
Public Access Catalogue (OPAC) is an important module in all library packages. The
present study evaluates three important library software packages, namely, Alice for
Windows, Libsys, and Virtua in the context of OPAC module.

Egbert de Smet (2009, pp. 61-67) mentioned that, The new ABCD software
for free and open library automation with ISIS is presented with its technological and
practical characteristics. As a web-based integrated solution it combines most (if not
all) functions of other systems such as KOHA with the flexibility of the (Win)ISIS
software to create and handle databases of any structure. The main technical
characteristics as well as some managerial issues are briefly presented. The planning
on the further work is discussed along with some challenges related to the specific
nature of the ISIS users community.

library automation in Kannada University, Hampi. Kannada University specialized in
Kannada studies and have specialized research centers. This study attempts to
understand the need for the library automation, requirements of hardware, and
Benefits of SOUL is given.

Breeding, Marshall (2009, pp. 10-15) addresses the cost of library automation
software. The cited factors that influence software pricing are private negotiation,
economic climate, hosting options such as software-as-a-service, and the components of public open source contracts. Also discussed is the impact of the inclusion of confidentiality clauses in license agreements and contracts prohibiting disclosure of prices on libraries. It suggests the possibility to gather pricing and expenditures data for libraries and stresses the need to understand pricing benchmarks.

Taole, Nthabiseng (2009, pp.224-231) stated that, There is a growing interest in the INNOPAC library automation system, which has been implemented by several libraries in the Southern African region over the past 10 years. The majority of these libraries have installed this library system through consortia membership, and others have done it individually. This article evaluates the performance of the INNOPAC library system in five libraries in the Southern African region using the performance criteria of Functionality, Usability, Support and Training, and Vendor. The article identifies the strengths and weaknesses of the system, and makes recommendations for implementation in other similar libraries in the region. It also outlines a proposal for an INNOPAC-based consortium for the Southern African region.

Lanre Osaniyi (2010, pp.87-97) evaluate the potential of the X-Lib Library Automation System in Nigerian university libraries through an assessment of how it meets the current and future requirements of Babcock University Library. The result showed 62.6 and 45.5 percentage fits respectively to the current and future requirements of the Babcock University Library. The strengths and limitations of X-Lib are highlighte.

Anuradha, & Savanur (2010, pp.621-630) published as, With the Open Source Software (OSS) initiative catching up, there are many Integrated Library Automation Packages (ILAP) available. These OSS-ILAPs are comparable with any commercial ILAP. However, the success of any OSS mainly depends on the availability of the manuals and technical support. NewGenLib in an ILAP and was released in March 2005 as commercial software but declared OSS in January 2008. However, there is no detailed installation manual available. Hence an effort is made here to give a detailed step by step procedure for NewGenLib installation both on Windows and Linux operating systems. The study was carried out in 2008 and two workshops were conducted during January and August 2009 and more than 50 professionals were trained. Giri, Rabishankar/ Sengar, D S (2011)Provides an insight into the practical implementation aspects of selection and implementation of Open Source Software (OSS) for managing the activities and services of a library or an information centre.
Identifies that a main pre-requisite for OSS use in libraries is for the librarian to be able to harness the potential capabilities of its staff by motivating them effectively. Finds that OSS is more future oriented and more easily amenable for customization and can be an effective low-cost alternative to their proprietary counterpart.

Kumar & Nikam K. (2011, pp. 182-193) Describes briefly the design and development of a machine-readable Sanskrit-English glossary for Yoga and allied sciences using GSDL (Greenstone Digital Library software). Applications of glossary in an information system are mentioned Shailendra, K and Raj, Namrata (2011, pp. 47-64) Though a variety of softwares are available in software market, but only few of these are fully compatible with Web. This is a review of the research on library automation software and their compatibility with the recent advancement of Web as an interface used for accessing the software in www environment. It also focuses on the growth and development of library automation software way back to their origin. It also discussed standards, both in terms of library and Web technology. Finally, the topic on Web interface used in library management software system (LMSs) is covered including the technological implication, Web-based technical services, security issue, database used and evaluation of LMSs. Neelameghan A., Lalitha S.K (2011) Describes searching Greenstone Digital Library (GSDL) multi-lingual and multi-media databases, the search terms – English, Kannada, or Tamil – being selected from a multi-lingual dictionary. The dictionary also serves as a sort of index to the related databases and is useful in vocabulary management at the data input and search stages. GSDL, Databases, Collections, Multi-lingual, Multi-media, Search and Retrieval, Multi-lingual dictionary, Terms selection.

Birje S.R., Khamkar (2011, pp.131-145) discusses the phase wise development of the automation process. Library automation is becoming a ubiquitous activity that is being taken up by most of the libraries of educational institutes of higher learning over the globe. The paper discusses the phase wise development of the automation process that comprises of retro conversion, barcode code ID generation, member id generation, and house keeping operations. The authors intend to share their experiences may be useful to other professionals.

Bashir Ahmad and Nazir Ahmad Bhat (2011, pp.14-29) discusses the design and development of a database created for storage and retrieval of information about individual journal articles published in about 138 Indian and foreign current journals, 28455 journal issues existing in the back files section and full text of 356 theses.
available in electronic format at the Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir (SKUASTK). The database of books is managed through SOUL software and CD-ROM abstract databases running on WinSPIRS has been linked with this IS&RS. Entire IS&RS is being successfully run on LAN of the university. The IS&RS has been developed on MS Access platform with Visual Basic as front end. The IS&RS system consists of four modules viz: data entry, search, report, and administration-cum-monitoring. The database has been placed on the campus network and is running smoothly with encouraging operational results and interoperability with other databases.

**Library Management Software: Products and Services by VENDOR:**

Kreimer, Richard (1991) presents updates to library-related news items. Auction of portions of the rare book collection at the Kansas City Public Library in Missouri; Acquisition by Ameritech Corp. of NOTIS Systems, Inc., maker of library automation software; Lawsuit brought by homeless man Richard Kreimer against the Joint Free Public Library of Morristown and Morris Township, New Jersey; Order by the Russian Federation's Arbitration Court that Moscow's Lenin Library turn over 12,000 volumes to the Lubavitch sect. Macademic. (1994) Presents high technology products designed for educational use. Includes Alexandria, a library automation software package from Companion Corp.; HomeWork Hotline voice mail package from High Tide Software; Mac Control series of security software from BDW Software. INSETS: Performance-based assessment is at hand.; Video editor is newly affordable, powerful. Addresses of Companies (2000) Presents a directory of companies listed in 'Computers in Libraries' magazine's 2000 Buyer's Guide. Contact information for companies offering library automation software, hardware, integrated library systems and services, Library equipment and supplies, and other resources.

Fiehn, Barbara (2006, pp.30-32) defined library automation vendors Softlink, Follett Corp., SirsiDynix and Mandarin Library Automation Inc. Softlink has a long history in the design and support of its library automation software. Follett acquired Sagebrush Library Automation Software in July 2006 which led SirsiDynix to launch the Horizon K-12 initiative. Mandarin is continually offering Mandarin M3 for free download. Title: Products and Services by VENDOR: COMPanion Corp./Alexandria Library Automation. (2006) provides a list of products and services related to library automation offered by COMPanion Corp. The general hardware products offered
include backup devices, bar code readers and handheld scanners. The library automation software products offered include acquisitions software, authority control and bar code printing. Products and Services by VENDOR: Comprise Technologies.(2006) provides a list of products and services related to library automation offered by Comprise Technologies. The library automation software products include PC Management Software--Internet Reservations, PC Management Software--Printing and PC Management Software--Time-out. ELB Internet Services, Inc.(2006) The article provides a list of products and services related to library automation offered by ELB Internet Services Inc. The library automation software products offered include PC Management Software--Printing, PC Management Software--Remote Control/Repair and PC Management Software--Security. The technology services offered include consultation for Internet filtering in Library Automation Systems. Products and Services by VENDOR: Index Data.(2006) A list of the computer software and technology services being offered by Index Data to libraries is presented. They include application software for database management and library automation software for indexing. Products and Services by VENDOR: Variant Microsystems, Inc. (2006) listed the products and services being offered by Variant Microsystems Inc. for library automation is presented. Under the general hardware category, the company offers bar code readers, handheld scanners, scanners and self-check systems. Among the library automation software being offered by the company are bar code printing software and inventory control software.

Cleveland Ohio (2006) states that the Ingalls Library of the Cleveland Museum of Art has chosen the library software company Ex Libris Inc. to be the provider of the art museum library's integrated library management system. Systems provided to the library by Ex Libris include the ALEPH 500 library automation system, MetaLib library portal, and SFX context-sensitive link server. The Ingalls Library holds the museum's archives and an image library. Comments are provided by Ingalls Library director Betsy Lantz and Ex Libris president Dan Trajman.

Lee Chi-Ju (2006,pp.161-172) describes projects initiated by the National Library of Korea (NLK) with the aim of improving the nation's information competitiveness. The Library set up a library automation team in 1979, working for library automation in Korea generally as well as in the NLK. Firstly, the NLK developed an automation system for the national bibliography, which was collected and catalogued by the NLK. Secondly, the NLK developed the Korean Library
Automation System (KOLAS), which has been distributed to both public libraries and government libraries throughout the entire nation. The library management information system will help library patrons use the library collection more conveniently and will be distributed to public libraries nationwide.

ELB Internet Services, Inc (2006) provides a list of products and services related to library automation offered by ELB Internet Services Inc. The library automation software products offered include PC Management Software--Printing, PC Management Software--Remote Control/Repair and PC Management Software--Security. The technology services offered include consultation for Internet filtering in Library Automation Systems.

Cibbarelli, Pamela (2008, pp.6-53) discusses findings of a survey of integrated library systems (ILS) vendors in the U.S. In 2008, it was found that holds management and prepackaged reports have been provided by all vendors responding to the survey. The results further reveal that several features and capabilities have become almost ubiquitous. These include acquisitions management, application service provider (ASP) service, authority control, decision support, interfaces to bibliographic utilities, interfaces to commercial databases, and interfaces to digital content. The history of library automation has been chasing the most popular operating systems for the host computer or the server.

Antioch Public Library Wins ASCLA/KLAS/NOD Award.(2008)The article announces that Antioch Public Library in California has won the Association of Specialized & Cooperative Library Agencies (ASCLA)/ Keystone Library Automation System (KLAS)/ NOD Award for its successful outreach to adults with developmental disabilities.

Breeding, Marshall (2008, pp.36-39) explores the growing interest of U.S. libraries in open source for technology solutions. According to the author, open source software has been finding an increasing role in libraries, especially for behind-the-scenes infrastructure components. He observes that open source library automation systems, including Koha and Evergreen, have been propelled into the limelight. He believes that the decision between open source and proprietary automation systems involves many factors.

Hyman and Walker (2008,pp.1-6) stated that, On December 10, 2007 the Andrew W. Mellon Foundation named the Georgia Public Library Service (GPLS) as one of 10 recipients of the second annual Mellon Awards for Technology
Collaboration for the development and release of the Evergreen open-source library automation system.

Duke University (2008) reports on the announcement of the Library and Archives Canada regarding its participation in the core partners for Open Library Environment Project in Ottawa, Ontario. The project is lead by the Duke University and funded by the Andrew W. Mellon Foundation. The project will develop a design document for a next-generation open-source library automation system. The automation system fits modern expectations for library workflows and is built on a modern service-oriented architecture.

Evergreen (2008) reports on the selection of the Evergreen library automation system by the Michigan Library Consortium (MLC). Presently, MLC is working in collaboration with the Grand Rapids Public Library. The system will be provided by Equinox Software Inc. The first four libraries belonging to the consortium that will be converting to the Evergreen system include the Branch District Public Library, the Niles District Public Library, the Grand Rapids Public Library and the Traverse City Public Library.

**Evolution Criteria of Library Management Software:**

In some developed countries, a majority of the labor force already works in service industries. Yet, Performance evaluation in these industries has been difficult. In particular, the quality of service provided by information technologies is not easily evaluated. In the information industry itself, which is a labour-intensive service industry because of the cost of software, no appropriate way of evaluating a software product is yet known (Goswami, 1995, p.69-70). Although the problem indicated by Goswami is to a certain extent significant, yet many authors have outlined the criteria for evaluating software Good (1983, pp.92) stated that the most important rule in software selection is to know your application an buy for your applicaton. Mandelbaum (1992) has outlined a ‘software evaluation criteria’, which provides an overview of the types of general issues that can be considered with any types of software.

**Compatibility**

- Is the software designed to do what you need it to for this function?
• Will it run on the computer you expect to use, or on any other computer? Are there computers on which it definitely will not work?
• How much memory does it need to operate at a minimum? How much memory does it need to operate well?
• Does it require any specific equipment or other pieces of software?
• Will your printer be appropriate for the speed any types of output required? Is a graphics printer required?
• Are there ways to speed up the software? Do you need them?

User Interface Issues
• Who will be the primary user? Are the comfortable with the software?
• Does the interface lead users to the right functions and minimize frustration? For example, can it accommodate typical library users such as patrons, students, volunteers, or temporary staff?
• If any users are physically disabled or visually impaired, can they use the interface successfully? Is it compatible with any adaptive equipment they might have?
• Are both command-driven and menu-driven options possible?
• If the interface is graphical, does the software require specific hardware and accompanying software? Can the software be run on other configurations? Is there a character-based equivalent?
• How do you select what to do next? Can you use both the keyboard and a pointing device (such as a mouse)?
• Can you ‘stack’ commands to have the software do a series of command without waiting for you input?
• Can you change defaults?
• Varuavke skill levels does it have both novice and expert ways of operating?
• How is online help provided?
• Is it visually well designed?

Learning
• Is there an easy-to-use manual?
• Is there an online tutorial you can follow?
Messages
• Does the software provide messages (such as errors and prompts in plain English)?
• Are error messages helpful?
• Does the software provide status messages when it is processing?

Installation
• Does the installation process give you choices, so you can install, as you want to?

Output
• Can you send output to the screen, a file, or a printer?
• Does the software create standard ASCII test files for transfer to other applications?
• For reports, are there ways to modify the format, sort order and selection criteria?

Support
• What about knowledgeable assistance? Is the there toll-free telephone support or an electronic bulletin board?
• What about updates? Is there a maintenance contract option?
• Is the software copy protected?
• Is training available?

User References
• Can you get references from other users of the software?
Meghabghab (1997,pp.40-41) has mentioned the following criteria that should be considered for evaluation:
• The capability to integrate multiple modules;
• Presence of all modules needed;
• Presence of essential features in each modules;
• Strengths of each module;
• Overall software capabilities (e.g. for multi-user access, Internet access, networking expandability);
• Compliance with the latest bibliographic standards (i.e., U.S. MARK and U.S. MAR/ Micro LIF) and the information retrieval standard Z39.50. Cohn and Kelsey (1997, p.63) have outlined evaluation criteria for library software.

• Compliance with specifications set forth in OR (operational Requirements)

• Adequacy of hardware configuration

• Availability of all desired software modules

• Functionality (workflows between functional processes) Capability for system expansion and upgrading

• Cost

• Training

• Documentation

• Supplier’s past performance

• Supplier’s financial and organizational credibility

Overall suitability of the system.

Balboa (1992) has mentioned the attributes of good library management software, which can be used as evaluation criteria. These attributes are as followed:

• Flexible data structure

• Simple to learn and use

• Powerful data management

• Rapid and powerful searches

• Flexible report generation

• Network compatible

• Importation of data from any source

• Reliable data security.

Rowley (1998, pp.83-86) has pointed out the specific factors that must be considered when choosing any specific kind of software package, such as library management system. First he has mentioned few general points i.e. other people’s experiences, cost, originator and supplier. In addition to general points, he has mentioned a number of technical features of software packages i.e. language, operating system, hardware, ease of use, and support: it may take various forms i.e. a) Documentation, b) Advice in setting up, c) Training, d) maintenance, e) User clubs.

Warwick, Shelly (2001,) While most librarians have learned to evaluate automation library software in the field, current library and information science
students often have the opportunity to learn this skill in the classroom. Explores some of the benefits and challenges of teaching evaluation methodologies, and discusses how students handle such assignments. Highlights how student problems can provide a lens for those working in the field.

Kochtanek (2004, pp.69-170) has mentioned these factors to evaluate a system:

- Cost-includes both the purchase price, as well as ongoing maintenance charges
- Software functionally
- Software ease of use
- Adaptability flexibility system sets up parameters so the software will follow the library’s policies
- Documentation typically includes user manuals for each module
- Hardware manufacturer the reputation of the company
- Scalability-ability of the system to easily expand
- System reliability- is there system availability (up-time) statistics to demonstrate the server’s reliability?
- System response time- what is the response time experienced by other customers? Does the vendor provide any benchmarking data?
- Training services-time spent on-site training staff
- Vendor support services-can a customer visit a Web site to report a problem or track the status of a previously reported problem? How often are new releases of the software distributed to customers?
- Purchase/Maintenance agreement guarantees
- Vendor’s past performance
- Vendor’s financial stability/profitability
- Overall suitability of the system (pp.69-170)

Arizona (n.d.) has provided a number of factors, which can be considered while evaluating the library software.

- Technical requirements
- Operating systems & hardware configuration
- Special versions & security
- User friendliness & documentation
- Limitations
- Database Vs non-database (RDMS)
• Input & maintenance of data
• Indexing of stored information
• Retrieval of stored information
• Output of data
• House keeping activities
• Ease of use
• Tried & tested features
• Good documentation
• Large user community
• Built-in routines
• Compatibility
• Vendor
• Performance
• Flexibility value
• Continuous support
• Obsolescence and upgrades
• Software guides & directories
• Reviews
• Benchmarks (No. of records)

Babalhavaeji, (2010, pp.25-39) review the literature related to quality assessment and performance evaluation in academic libraries, whether empirical or theoretical, and to extract key issues. The literature reveals that evaluating ITBS in academic libraries should be considered to a greater extent and thus, more evaluation studies on the basis of validated tools are needed. Research limitations/implications - The review does not claim to be comprehensive. Originality/value - The paper can serve as a research roadmap concerning quality assessment of ITBS in academic libraries for researchers, managers, academic authorities and users.

Noh, Younghee (2011, p.13) seeks to rediscover the most suitable efficiency evaluation variables (input and output variables) for digital libraries and to employ the data envelopment analysis (DEA) model to measure the resource utilization efficiency of university libraries. The paper identifies that there was a significant difference in efficiency, according to the presence of electronic resources in university libraries.
Standards Used In Library

Association of College and Research Libraries (1959) A working plan for devising standards for college libraries begins with the stated purpose of providing a means for assessing the adequacy of libraries serving liberal arts programs at the bachelors and masters degree level. A general statement of content and a commentary are provided for each of eight major standards: 1) objectives, 2) collections, 3) organization of materials, 4) staff, 5) delivery of service, 6) facilities, 7) administration, and 8) budget.

Totten, Herman L (1959,p.29) review the literature on college library standards was conducted in order to tabulate the elements found in the latest statements of accrediting agencies and library organizations. These studies considered requirements for libraries made by 21 accrediting organizations in such areas as law, business, health, etc. The elements most often checked on both charts were: resources, staff, finances, services, facilities, and administration.

Harvey, John F (1971,p. 33) mentioned the standards for iranian senior college libraries. A four year or senior college may provide a liberal arts education or preparation for a particular profession, like nutrition or banking, the library which has reached a particular standard should not be completely satisfied with its accomplishment but should continue to improve until it can give outstanding service in that area and can reach the standards in other areas, also. It should be clear that the purpose of these standards is to improve iranian libraries, not to standardize them.

Hirsch, Felix (1972, pp.159-355) emphasis that, Major facets of the american situation are described by authorities and progress in england and canada is presented by experts. The emphasis of the issue is on standards for various types of libraries. Standards in library technology are reviewed, as are efforts for international standards. Individual chapters are devoted to: standards for public, state, and university libraries; college library and two-year college library standards; standards for media programs in schools; special libraries; library service in institutions stitions (correctional and health); library technology; canadian and british library standards; and efforts for international standardization for libraries.

Brown, Helen M (1972, pp.204-218) discussed the historical background, needs for revision, recent activity, and future directions of college library standards.Standards for college libraries.(2000) Focuses on the establishment of
college library standards in the United States by the Association of College & Research Libraries (ACRL). Points of comparison used in planning the standards; Stages involved in the planning, assessment and outcomes assessment of the program; Questions and issues considered by the ACRL in the standards program. INSET: Applying the new standards for college libraries. Title:

Fidzani and Oladokun (2001, pp,243-248) was recommended that, to assess the state of libraries in Institutes of Health Sciences in Botswana. It was recommended that the Ministry of Education, the Ministry of Health and the University of Botswana, to which the Institutes of Health Sciences are affiliated, should work together to facilitate improvement on library collection, library services, staffing, and library facilities. Information Studies (2001) in this era of global resource sharing and exchanging of bibliographic records from one system to another, is a widely prevalent practice. Instead of using a single standard to create bibliographic machine catalogue record, there has emerged more than twenty cataloguing codes and are being used as standards. This has caused variations in record formats and created problems in sharing of resources among the institutes locally and globally and transfer of data from one system to another. To avoid this problem keeping in mind that countries such as India and those in South-east Asia are using the CCF as a standard for creating bibliographic records, this paper describes ways for converting bibliographic records into UNIMARC and MARC21. In addition, it describes what problems may be encountered during the exchange of records and how they may be overcome.

Bowman, J.H. (2006, pp.34 – 48) to compare Anglo-American cataloguing codes and practices for description over the past 150 years and assess the contribution that they made to International Standard Bibliographic Description (ISBD). Practical implications – In revising AACR2 it is important to be able to see how we have reached where we are now, and in particular to avoid repetition of past mistakes. In an increasingly international publishing environment it is vital to solve the problem of multiple places of publication. Originality/value – This subject has never been tackled in this way before, and the findings are timely for the ongoing revision of AACR2.

Changing Role of Professionals/ Manpower:

Tickton, Sidney (1966,pp.33-44) search that, Ten methods taken from industry and business could be applied to help overcome library manpower problems. (i) create
a new level of enthusiasm among people in the field by increasing salaries, (ii) increase productivity by appropriate job subdivision redefining responsibilities so that more teaching and training can be undertaken. (iii) provide in-service training to upgrade sub-professionals. (iv) make more use of underutilized segments of society, e.g. Use womanpower in school libraries or as student counselors in libraries. (v) concentrate professional training on people expected to remain in the profession for a long time. (vi) take advantages of automation and mechanization. (vii) look into the possibilities of new construction design and better space utilization. (viii) unify catalogues, extend interinstitutional cooperation and divide up subject matter acquisition. (ix) parlay the use of federal money. (x) use local qualified people to help advise you, e.g. Your local trustees. Manpower problems will not be solved by surveys or statistics but by action.

Havens, Shirley (1967, pp.2713-2719) reports on, the papers and discussions at the 86th annual conference of the ala, which were related to the theme 'crisis in library manpower. The following morning eileen thorton summarized the reports. The proposals are detailed at length. Neat three librarians considered the applications of the recommendations within their specific spheres of activity; dorothy anderson (library recruiter) ; page ackerman (library administrator) and foster mohrhardt (incoming ala president). At the close of this section the author gives editorial comment on the potential success of these discussions.

Brown, Helen M (1969,pp.75-84) described as, College library administrators will need to be alert for the point at which a computerized operation could profitably replace personnel on their staff. Another force of consequence to the personnel needs of college libraries is the involvement of the federal government in support of libraries. There is also a growing urgency for granting academic status to college and university librarians. Also, much work traditionally considered professional can be done well by non-professionals.Katter, Robert and Wallace, Everett M (1969) describes the results of a project to conduct research on, and to develop instructional materials for use in, on-the-job training of professional and non-professional library personnel in scientific and technical libraries. It is concluded that the developed instruction meets its design objective and provides effective means to enhancing skills in the three areas concerned.
Cavan M. Mc Carthy (1983, pp.149-158) searched that, A study of the major automated libraries and bibliographic information systems in Brazil showed that the most important problems were, in ranked order, lack of experienced personnel, lack of financial resources, lack of official guidelines and government policy, and lack of networks and cooperation. There was a lack of national planning, in what was often considered a peripheral area, and the central organs of library and information science were weak. Information was transferred between institutions in an almost random manner. Most automation was done in isolation, and there was no exchange of bibliographic data between libraries. The author proposes a series of small-scale initiatory projects to spread practical experience around the country.

Stella J. (1986, pp. 159-162) has assumed that, Education and training are the keys to survival in an ever-changing world where some permanency and stability is sought. The identification of specific educational needs for coping with new technology is a necessity. Library and information workers must seek education and training which will enable them to exploit the new technologies and cope with change and innovation. Constraints on the introduction of new technology into the developing countries, using Nigeria as an example, are discussed. While material resources are a major requirement for successful automation, these alone will not guarantee success, for which competent, capable and proficient staff are a prerequisite.

Khalid Mahmood, Muhammad Ajmal Khan (2008) concludes that, if some committed professionals present themselves for voluntary endeavors and plan to develop their nation without any material resources, they can play a significant role in the promotion of ICT in the libraries of a developing country.

Jana and Panigrahi (2010, pp.12-20) identifies the causes of poor motivation towards work and suggests motivating parameters for non-government college librarians in West Bengal. The study is carried out on the basis of a survey conducted among 200 non-government college librarians. Finds that many prevalent factors like status, salary, service conditions, recruitment and promotional policy and managerial relations, etc. are responsible for poor motivation. Suggests that authorities should have in place various motivating factors in order to have motivated non-government college librarians who can provide their best services.

Lyon, Becky (2011, pp.231-241) addresses how NLM joins forces with organizations and partners such as the Medical Library Association With new challenges facing academic health sciences libraries in the 21st century, the profession
needs to develop a workforce capable of integrating more directly into the campus organization, the research enterprise, and the clinical setting. This article addresses how NLM joins forces with organizations and partners such as the Medical Library Association, the American Library Association, the Association of Academic Health Sciences Libraries, and the Association of Research Libraries to sponsor recruitment programs, midcareer leadership training, and scholarships for library school students to achieve a diverse workforce.

**Research in LIS**

Kershner, Lois (1979, p.4) search that, The amount of change resulting from the implementation of the bibliographic automation of large library operations using a time-sharing system (ballots) is analyzed, in terms of 1) physical room arrangement, 2) work procedure, and 3) organizational structure. Libraries using ballots more than 12 months perceived more change in organizational structure than those using the system for a shorter period. Appended are the questionnaire, lists of study population, library statistics, and response data by library Grover, R and Glazier, J (1986) delineates various levels of theory with implications for research in library and information science. Based upon a review of literature on theory building and research methods in the social sciences, a model is proposed which displays a taxonomy of theory in hierarchical f

Wallace, Danny (2007) discusses the link between practice and research in academic library and research in the twenty-first century. Accordingly, librarianship as a field of professional practice began to reach maturity in the last half of the nineteenth century wherein emergent best practices were tested, informally normalized and codified. In addition, research in library and information science trailed the development and codification of practice in librarianship by several decades. However, the early twenty-first century is simultaneously a time of recognition and a time of uncertainty for the library and information professions.

Katz, J. (1989, pp.96-110) searched that, Three major causative factors for the current state of library and information science research are identified: (1) too much of what has been called research falls under the heading of consulting or demonstration projects; (2) too few academic and professional colleagues have the inclination or training needed for research; and (3) not enough resources are available to support research conducted on anything more than an opportunistic basis. It is
concluded that ALA is in a unique position to advance to research infrastructure of the LIS field, and that by not doing so, it serves to seriously impede its development. McClure, C R.(1989) discusses the importance of research for library management. As a means to increase the impact of research, a number of propositions are suggested. These propositions identify possible strategies for both researchers and library managers to better create and use research. Conceptual and practical issues also are discussed that affect the utilization of library research, and the article concludes by stressing that the utilization of research will improve only with a conscious effort on the part of both library managers and library / information science.

Elliott, P (1988) describes the historical development and coverage of CURRENT RESEARCH, an international quarterly published by the British Library Association. The publication provides a current awareness service on research and development work-in-progress in library and information science, archives, and other information fields. Kruger, J A (1992) an investigate the completed academic research projects in Library and Information Science at master's and doctoral levels at South African universities from 1983 to 1990. The number of completed research projects, various universities involved, number of men and women involved in these projects, and language medium of the research reports were analyzed. Trends are indicated.

Hannabuss, S (1995) emphasis on research in library and information studies. Political factors have also been at work from the perceived need new entrants to the profession have of the desirability of a master's degree, demonstrating mastery of at least fundamental researching skills, to the momentum in higher education to provide a wide range of challenging courses which purport to ensure competitive advantage for their graduates in the market-place. Newman, Wilda (2004) reports on the Library Theory and Research (LTR) Section of the International Federation of Library Associations and Institutions (IFLA) held in Buenos Aires, Argentina. LTR contribution to the LTR program; Contributions from the Education and Research Division to the subject of barriers to literacy; Novel approaches to library research in Argentina; Research tools for library and information science. Shenton, Andrew (2005) In contrast to the considerable coverage of research methods and report writing, The paper concludes with consideration of the qualities and skills that the published author may be expected to demonstrate and isolates instances in which they are applied. Kim, and Jeong (2006) identifies the state and characteristics of theoretical research in library and information science journals by examining the
number and the quality of theory incidents. The overall proportion of theoretical articles has increased. They showed a tendency to converge into a few subfields, such as information seeking and use or information retrieval. However, the declining share of theory development articles in recent journal issues and the overall low level of theory incidents are urging LIS researchers to the importance of continuous and creative research in LIS.

Denise and Crumley (2006, p. 5) attempting to incorporate research into decision making raises several questions about the research that currently exists in librarianship, areas that are most in need of research, obstacles to conducting research, and possible solutions for nurturing a professional environment in which conducting and using research becomes an accepted and expected part of our practice. This paper points out gaps in our research knowledge, and areas that need to be explored via research in library and information studies. It is hoped that this paper will encourage librarians to think about how they can incorporate research into their daily practice. Fidel, Raya (2008) stated the mixed methods research (MMR)—which integrates qualitative and quantitative methods in one study to improve the study's quality—is not common in library and information science (LIS) and has not been discussed in its literature. However, the recognition of MMR by name or as a research method was absent from these articles and from the methodological literature in LIS. The various strengths of MMR suggest that being cognizant of its possible use in LIS would benefit researchers in the field. Bowler & Andrew (2008) design-based research is a methodology emerging from the field of education that may hold potential for research in library and information science (LIS). The method is also of interest to professionals concerned with “evidence-based practice.” This article will first explain and describe the method as it has been used in the allied field of education. Issues related to definition and methodology will be explored, as well as some of the solutions that have been proposed. The method will then be related to LIS, using the bonded design work of Large, Nesset, Beheshti, and Bowler [Large, A., Nesset, V., Beheshti, J., & Bowler, L. (2006a). Bonded design: a methodology for designing with children. In S. Kurniawan & P. Saphiris (Eds.), Advances in Universal Web Design and Evaluation: Research, Trends and Opportunities. London: Idea Group., Large, A., Nesset, V., Beheshti, J., & Bowler, L. (2006b). “Bonded design”: a novel approach to intergenerational information technology design. Library and Information Science Research, 28, 64–82c] as a case study to demonstrate the applicability of design-based
research to LIS inquiry. Clare Thornley, (2009d) This paper reviews the discussion of central dilemmas within IS and IR, through literature review and conceptual analysis. It assesses the extent to which they remain intractable problems or whether improved solutions have been developed and discusses the implications of these ongoing challenges. This paper re-visits an important theme in IS and IR and provides an updated perspective on some central issues.

Mukherjee, Bhaskar (2010) highlights the quantitative performance of scholarly LIS research in Asian countries based on articles published during 2001-2007 in journals indexed by the Social Science Citation Index of Web of Knowledge. The research performance analysis indicates that articles written by authors from South Korea received the highest number of citations, followed by Taiwan. Although the quantity of articles published by authors of Taiwan and South Korea is higher than Singapore and Israel, the articles contributed by authors from these latter two blocks appear in higher-impact journals. These findings show the increasing contribution made by Asian scholars to the international LIS literature, and the quality of that research.

Sweeper, Darren and Smith (2010) stated that, Using data from the 2003 US National Survey of College Graduates, a longitudinal survey administered by the US Bureau of Census for the National Science Foundation, this study examines earnings in the library and information science labor market and assesses the impact of gender and race on the earnings attainment process. This is followed by a discussion of the methodology used to analyze the data and test the model, and the results, discussion including recommendations for further research, and conclusions.

Rana, (2011, pp.667-680) presents the comprehensive review of research works in the library and information science (LIS) discipline in India during 1957–2009 in order to identify trends and patterns in doctoral research, both at the national level and within the Department of Library and Information Science, Panjab University, Chandigarh (PU). Diversity of themes and use of scientific methods in research, as a marked feature of doctoral dissertations at PU in recent years, prompted one of the researchers to formulate as many as twenty hypotheses for empirical testing. Interestingly, six of the ten theses awarded between 2000 and 2003 in the department contained themes either focusing on Iran or comparing Iran with India. This was indicative of the department’s popularity with foreign students, especially Iranians. Another interesting feature was that two of the teachers in the department
supervised more than a half of the total Ph. D. theses awarded up to 2009. Saint and Moens (2011) presents a roadmap of current promising research tracks in question answering with a focus on knowledge acquisition and reasoning. We show that many current techniques developed in the frame of text mining and natural language processing are ready to be integrated in question answering search systems. Their integration opens new avenues of research for factual answer finding and for advanced question answering. Advanced question answering refers to a situation where an understanding of the meaning of the question and the information source together with techniques for answer fusion and generation are needed. Cobo (2011) Science mapping aims to build bibliometric maps that describe how specific disciplines, scientific domains, or research fields are conceptually, intellectually, and socially structured. Different techniques and software tools have been proposed to carry out science mapping analysis. The aim of this article is to review, analyze, and compare some of these software tools, taking into account aspects such as the bibliometric techniques available and the different kinds of analysis. Park and Caimei (2011) Analysis of a survey of the types and extent of tools and techniques related to semi-automatic metadata generation applied in real-world library settings indicates that practical applications in libraries seem to be at an incipient stage. This indicates that more research is needed on the development of automatic metadata generation for semantic metadata in usable and practical settings.

Development in OPAC:

Rajendrian and Parihar (2007, p.2) presents a method for capturing bibliographic information from collections of Web OPAC (Online Public Access Catalogue) and online bibliographic databases for library cataloguing. The LibSys 5 (Release 5.0) - Library Automation Software, module for bibliographic data import was executed, and the cataloguing data for document(s) has been captured. By adopting this method, libraries can create error free, standardized catalogue also saves the time of cataloguer, and reduces the costs.

Ansari, Mehtab (2008, pp.111-129) to establish the opinion of users with respect to the awareness and utilization of, as well as their satisfaction level with, the use of the online public access catalogue (OPAC). The paper focuses on many aspects of OPACs, particularly those in India. Librarians, especially those from developing
nations, may choose their library automation software packages keeping in view the user's expectation with respect to OPACs.

Mulla & Chandrashekara (2009, pp.321-332) research the effective use of Web Online Public Access Catalogue (Web-OPAC) in engineering college libraries in Karnataka. The main objective of the study was to examine the primary data is obtained from the cross section of user community through questionnaires. The study revealed that the tool is useful and at the same time respondents felt that there must be user orientation needed for the Web-OPAC, to help in retrieving the required documents. Examines the utilization and satisfaction of users about Web-OPAC and highlights the suggestions made by the users for the further improvement.

Kumar Shiv and Vohra, Ranjana (2011, pp.519-528) to investigate the use of Online Public Access Catalogue by the users at Guru Nanak Dev University Library, Amritsar (Punjab). A sample of 112 users was taken from various categories of users covering different disciplines such as Basic Sciences, Applied Sciences, Social Sciences and Humanities. The study suggests that the users should be made familiar with the use and operation of the OPAC by providing special training.

2.4 Conclusions

Library software is the most important tools for automating the library routines. The situation revealed by the review of relevant literature, predicts the non-availability of no. of standard library software system in India. In developed countries many directories and other tools are available, which can be consulted for the evaluation of the library software, Indian librarians face a some difficulty, if they have a evaluate the library software, best suitable and easily available for their library. After reviewing the literature regarding the evaluation of the library software it is found that no software package can meet all the requirements of a given library system. Inevitably, some compromises will be needed in workflows, input, output and report formats. Customization takes lot of time, by doing that other problems could arise. Therefore while evaluating the library software it is important to prioritize the requirements and make sure that the chosen software meets most, if not all the high priority requirements.
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