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Perspectives of Library Automation in Developing Countries: A Review

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Abstract **- Today libraries are moving from traditional ways towards Automation, which is the result of the need for modern information society. Automated libraries can immediately adopt various innovations in technology and provide the services very effectively, rapidly, efficiently, adequately and economically. The recent trend in automation of library has made significant growth in development and upgrading of the library. In India, Information Technology is being successfully introduced in all types of libraries and information centres. This article reviews the literature on the library automation. The literature includes journal articles, reports, monographs etc., published inside and outside India, discussing about Library Automation, Library Technical Process, Library Networking, Information Systems, Library Co-operations, Cataloguing, Integrated Library Systems, Library Services, Information processing, Academic Libraries, the need for library automation and the problems faced by library professionals.**
Keywords: **Libraries, Automation, Karnataka**

I. INTRODUCTION

Literature search plays a very important role in research activities, as it forms the very first step of research pursuit. A thorough review of related literature is essential in conduction a new research. The main function of review of literature is to determine both the theoretical and empirical work, which has been done before, that should assist in the delineation of the problems of the area. It provides a basis for the conceptual framework, insights into methods and procedures, suggests operational definitions of major concepts and also provides a basis for interpretations of findings. The study of the related literature implies locating, reading and evaluating reports of research as well as reports of casual observation and opinion that are related to the planned research project. In any worthwhile study, the researcher must have an adequate knowledge within the work that has already been done or going on in the area of his/her proposed research. The literature search must be conducted in a systematic way to achieve optimum results. Otherwise, the search may lead to the wastage of labor and time and poor retrieval of relevant information.

Since effective research is based on past knowledge, review of related literature helps to eliminate the duplication of what has been done and provide useful hypotheses and helpful suggestions for significant investigation. It is a valuable guide to defining a problem, recognizing the significance; suggesting and premising data gathering devices, appropriate study of design and source of data. This also helps to sharpen the understanding of the existing knowledge in the problem and provide background for the research project. Hence, the review of related literature forms an inevitable part of any research study.

It may be noted that in the area of Automation of Libraries, many library and information science professionals have made significant contributions to the area of research. These studies touch upon many peripheral areas of library and information science research such as automation, networking, information systems, library co-operations, and cataloguing. This chapter contains a review of relevant literature, which attempts to identify various aspects of library automation. The literature review findings have been organized into following categories:

1. History of Library Automation in India
2. Integrated Library management system
3. Resource Sharing and Networking
4. Feasibility of library automation modules
5. Academic libraries
6. Library automation at Government First Grade College Libraries

II.LIBRARY AUTOMATION

A well equipped and well-maintained library is the foundation of modern education structure. The library plays a vital role and it consists of knowing how and where to find information, the art of selecting and processing these documents which are of maximum use and how to deliver it to users who need it. Computer application in library and information field has made phenomenal progress in industrialized countries where hardware, software, and communication facilities are well developed. In view of technological advancement they are able to computerize their entire library and information system with great success.

Library automation is the part of in-house activities of any library, to apply the techniques to automate library activities through automation software or any other integrated library management software in the field of library and information science. In this context, the review of literature has been conducted using LISA, Google search, emerald database and other available resources in the field of library and

information science. The following key terms used for the purpose of preparation of the review chapter. Library automation, integrated library management systems, ICT, in-house activities, academic library, First Grade College libraries, etc.

Library automation in India is still in the early stages of development, and the discovery services market is yet to catch up, even though the library automation industry has considerably expanded alongside the information technology sector growth. Unfortunately, culture sector on a whole did not strengthen the cyber infrastructure, so the enhancements, financing, and development could be streamlined. Of late, the government spending on the knowledge infrastructure has been emphasized with few national initiatives taken up to develop consortia and networking of libraries to facilitate interdisciplinary and mutual information access, cutting across all the financial constraints as a developing nation India is encountered with. INFormation LIBrary NETwork (INFLIBNET) is a national inter-university centre for networking and resource sharing started in 1988. Under the aegis of INFLIBNET, National Library and Information Services Infrastructure for Scholarly Content (N-LIST), a total number of 5363 colleges have registered themselves with this programme including 4077 Govt. / Govt.-aided colleges covered under the section 12B of UGC Act as well as Non-Aided colleges, with a total registration of users 9,36,050 as on 23 November 2016 (INFLIBNET, 2016). The federal cyber infrastructure project National Knowledge Network is aimed to connect all the research and higher education institutions on a high-speed network for research and resources sharing started in 2008.

Chopra, Hans Raj (1980) discusses the need for the introduction of more mechanization in Indian university libraries. Describes the use of automatic revolving trays; electric typewriters; calculating machines; stylus pencils; the flex writer; photo charging machines; cutting and pressing machines; the shikanja (book clamp); and photocopiers. He notes the use of computer systems by Western university libraries, and sees the introduction of such systems in India as being a long way in the future [1].

Chopra, H R (1982) explain the changing need of society and progress in the field of science and technology, the old concept of librarianship has been changed. Now, the purpose of a library is to provide to clients specific and exhaustive information within the minimum possible time. Almost every library job performed in a library needs automation for prompt results. He discusses all types of library automation available in Western European countries outlining the growing necessity for automation in library and information work in India [2].

Raina and Raja (1997) has studied the automation programme of the Indian Institute of Management (IIML) Library and the selection of computer hardware and software for the library. In their study, they found that the introduction of various library housekeeping and information retrieval activities automated and ways in which the management of IIM was convinced of the need both to provide library computers to train the library staff in library automation activities [3].

Francis, A T (1998) explain the problems involved in the implementation of library automation and highlights the systems and infrastructure used for information management should have international standards and compatibility. He enumerates the important issues to be considered while selecting library software along with the names of the major library software available like commercial and open source software. He suggests the establishment of a constant mechanism to make the library professional aware of developments in the field, issuing of guidelines for standard library software, preparation of a list of standard software and evaluation of the software by a Software Evaluation Committee at the national level [4].

Oak, Veena *et al* (2005) describes the implementation of "e-Granthalaya" software in the State, City and District Central libraries in the State of Karnataka, by the National Information Centre, Bangalore. Developed in coordination with the directorate of public libraries in Karnataka, the package has also been implemented in several other States: Gujarat, Delhi, Lakshadweep, Chandigarh, West Bengal Orissa, etc. It provides bilingual (1 Indian language and English) and also multilingual (2 or more Indian languages and English) support for data storage and retrieval [5].

Thapa, Neelam, and Sahoo (2006) explain aims and objectives to understanding and analyzing the various problems faced during the process of automation and suggests ways to overcome these problems. It also aims at analyzing the benefits of automation. The methodology used is a questionnaire-based survey. The findings show that the lack of staff, lack of computer training of staff, hesitancy in learning the use of computers, software and hardware problems and lack of administrative support are the major hindrances to faster automation [6].

Bansode, *et al* (2008) highlighted the present status of library automation in the college libraries of Goa State, India. It explains the use of NEWGENLIB software (Consortium version) by college libraries and discusses barriers to library automation. In similar study carried out by Rao, Y Srinivasa et al (2009) Automation makes the library system, resources, and services more attractive and interactive, helping libraries to meet their users' expectations [7].

Naika, Manju (2009) in his study highlights the problems involved in library automation and explain the library professional staffs skills and utilizing their manpower to introduce library house-keeping operations effectively. And also highlights familiarizing techniques and strategies to adopt ICT application to automate libraries and retro-convert the records. It discusses the practical issues

involved in retro conversion work like methodologies and steps involved in each method. The solution presented here can be used as an effective tool for successful completion of library retrospective conversion [8].

Lohar and Naik (2009) explain the step-by-step process of library automation in Kannada University, Hampi. Kannada University specialized in Kannada studies and have specialized research centres. This study attempts to understand the need for the library automation, requirements of hardware, and Benefits of SOUL is given [9].

Rajput and Gautam (2010) carried out a study to know the status of library automation and problems in their implementation in special libraries of Indore city, Madhya Pradesh. It discusses automation, its need, and application in special libraries. The study explained the various problems faced by authorities and the staff during the process of automation. The tool adopted to conduct the study is a well-structured questionnaire. The staff hesitancy and lack of attitude towards automation and unsatisfactory library software problems are the major hindrances to speedy automation. It finally highlights the key suggestions for better implementation of library automation and to overcome the hurdles faced during pre and post automation [10].

Birje *et al* (2011) explain that 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. However, when it comes to automation of the library of a traditional university in the backdrop of the rural ambience; and with the weak IT base both in terms of skilled human resource and services, the study narrates the various dimensions of the implementation of the Library Automation project in any university library in general and conventional university libraries in particular [11].

Babu and Krishnamurthy (2013) highlights library automation to resource discovery: a review of emerging challenges, they have analyses the paradigm shift of library automation to resource discovery by exploring the applications of resource discovery. The present status of India on adapting resource discovery applications discussed. In their study focused on issues of library automation, next generation technology, and resources discovery tools which are very important in the library automation techniques. An evaluative method to examine the status quo of India automation and resource discovery scenario is drawn with a related literature [12].

Yuvaraj, Mayank (2016) studied the cloud-based integrated library management solution (ILMS): Librarika. An evaluation checklist was designed from the review of existing ILMSs as well as literature review. The checklist was distributed to the library staff of the Central University of South Bihar. Findings of Librarika were found to be comparable with existing open-source ILMSs but lacked transparency of data. Librarika had all the features of the commonly available open-source [13].

A. History of Library Automation in India

In the 1960s, INSDOC and DRTC pioneered the use of computers in Indian libraries with the computer-aided production of Union List of Serials, Roaster of Scientific Translators and Indian Science Abstracts by the former and a computer-based document finding system by the latter.

The first Circulation Control Automation was carried out in 1970 by the library of National Aeronautical Laboratory at Bangalore on an ICL 1004 system. By 1971, about 10 libraries were using computers for procurement accounting, cataloguing, preparation of library addition list and preparation of union catalogue of periodicals. The same year, Bhabha Atomic Research Centre (BARC) started Nuclear Science Information Service by an arrangement with INIS. Also, in the same year, DRTC developed indigenous software called, DOCFINDER for locating documents.

Between 1971 and 1975 there was a slowing down of computerization efforts until 1976 when INSDOC in collaboration with IIT Madras started a Selective Dissemination of Information (SDI) of Chemical Information and DRTC developed a package for SD1 Services for Bharat Heavy Electricals Limited (BHEL) at Hyderabad.

International online information retrieval services began with the demonstration of the access of the Frescati Library in Rome from the Tata Institute of Fundamental Research (TIFR), Bombay in 1976.

Large scale promotion of computerization came in the 1980s with the Indian Library Association (ILA), IASLIC and AGlLA organizing conferences, workshops, and training programs in library automation.

The National Informatics Centre (NIC) developed an integrated online bibliographic database for library documents using CDC Cyber 170/120 mainframe computer system. Further, NIC introduced over its computer-communication network, NICNET, a terminal-based access to its library database. NIC further developed a system for the National Medical Library for providing medical retrieval services and a keyword based retrieval of articles in the Constitution of India for the Ministry of Law, Justice and Company Affairs. All these developments ensued between 1980 and 1985.

In the 1980s, the trend of medium/large scale training of library scientists in the tool of modemization was initiated by DRTC, INSDOC and NISSAT which was strengthened by the Library Science faculty in various universities.

Gowri, R (1986) explains that automation of library circulation at Indian Institute of Science, Bangalore. The objectives of the automated system are formulated after giving a thorough study of the major distinguishing features and the objectives of the existing system. There are 8 procedures incorporated in the system to achieve the objectives. The invoking of these procedures are done be keying commands of 18 characters. Once a procedure is invoked it expects a set of inputs, and these are accepted through the machine's conversation with the user. The questions asked by the system during the conversation are self-explanatory and it makes it easy and simple to use the system. Also, it describes the actual mode of the system to convert the records into automated format [14].

Bhargava, *et al* (1993) highlights the library automation software package (SANJAY) has been developed in the CD/ISIS V2.3 environment extensively using the Pascal interface to meet the requirements of a model library. Using SANJAY, a user can get instant access to information, responses to queries and reports from multiple databases. In their study highlights the characteristics of the library automation and its features in carrying library automation. It is an interactive, menu driven and user-friendly package which carries out routine functions of a library. The software is capable of inter-relating two or more databases for a single application like acquisition or circulation. It identifies some of the problems in the CDS/ISIS V2.3 package and presents the features of the SANJAY package that overcome these problems and discusses its implementation in a government college library [15].

Jose, A (1997) describes the usefulness of LYBSYS, the fully integrated multi-user library automation system produced by LYBSYS Corporation, India and designed to run on a wide spectrum of hardware and software platforms. In his study summarizes its advantages of the software: simplicity in use; wide user base; regional applicability; networking capabilities; local support; and the presence of continuing research to produce search capabilities in improved versions [16].

Madhusudhan, Margam (2010) examined the use and implementation of RFID technology at the Indian Law Institute Library and National Social Science Documentation Centre Library, New Delhi. A survey was conducted at the two libraries, using a structured questionnaire comprising 20 questions. It was found that after implementation of RFID in both the libraries the check-in and check-out time is reduced to less than 20 seconds per item, and use of the libraries has also increased. Neither library had calculated the saving of staff time by performing multiple check-out and check-in of items. High cost is the most significant challenge faced after implementation of RFID technology [17].

B. Integrated Library Management System

An integrated library system (ILS), also known as a library management system (LMS), is an enterprise resource planning system for a library, used to track items owned, orders made, bills paid, and patrons who have borrowed. An Integrated Library Management System (ILMS) is an automated package of library services that contains several functions. These functional usually include circulation, acquisitions and cataloguing etc

Rao and Ford (1993) explain the primary considerations when choosing software for automating library operations in India, including the availability of the required software. It also describes automation modules which involve various activities of library automation which tells about integrated packages [18].

Singh, A (1998) explain the concept of library automation in India in the context of multimedia systems (CD-ROMs, images, audio-visual materials) and issues of compatibility with software packages designed for these applications. He considers software selection, modular approaches, bar code technology, additional features for automation and compatibility with multimedia. It can be implemented in a similar way in the academic institutes [19].

Sandha, D P *et al* (1998) pointed out that the CDS/ISIS package has helped many library and information professionals in India to create in-house databases. The majority of libraries and information centres in India use this package in comparison to other software. There are nearly 1400 licensed users of CDS/ISIS at present. CDS/ISIS is more popular among academic and research libraries than private industry. It helps newcomers to learn various concepts and approaches to design in-house databases [20].

Ningappa N Arabagonda (2012) in his article presented at National conference on Integrated Library management system briefs about the software packages which is the order of the day, in choosing economically and viable, to search effective tools for the learning and resource support. He highlights integrated library management system, its types, advantages and disadvantages and its application in libraries [21].

Keshava *et al* (2012) explain library is regarded as the brain of any institute. Many institutes understand the importance of the library to the growth of the institute and their esteem users. LMS support the general requirements of the library like acquisition, cataloguing, and circulation [22].

P G Tadasada (2012) narrates the advent of the internet and other ICT tools have enhanced the e-learning and pedagogical learning. There is a demand by a cross-section of the profession, that Integrated Library Management Systems (ILMS) should be more than what they are today. In fact, the ILMS should integrate the 'Research Support System' and 'Learning Management System' to extend the service effectively. An effort is made in this theme paper to discuss the features of Learning Management System. It explores some of the issues associated with Learning

Management System. It defines Learning Management System, lists its features and discusses the challenges of integration and finally describes the modules of an LMS [23].

I H Jahagirdar (2012) describe library software selection as one of the important tools while implementing library automation. The Software consists of all features regarded as the brain of any package; LMS support the general requirement of the library like acquisition, cataloguing and circulation [24].

Krishnamurthy and Meeramani (2012) argued that the library automation ways in which information technology developments have changed the academic library over the last few decades and speculates about further changes to come in an effort to expose the major themes, this article discussing many important issues such as open source technology, policy, and other wishes [25].

Bachhav, Nitin B (2016) examines the status of library automation and major constraints faced by libraries while automating. The study found that college libraries are still in the state of infancy with regard to automation and all of the libraries use local commercial software for automation. The study concludes with recommendations that would enhance and ensure effective and efficient use of the ICTs (Information and communication Technology) enabling libraries to provide their clients better services [26].

Ansari, Mehtab *et al* (2017) highlighted the status and application of an automated cataloguing system in Central University libraries in North India. Data has been collected using questionnaires. Interview and observation techniques have also been used to bring objectivity in the present study. Results show that varying levels of progress have been made with respect to implementation of a cataloguing system [27].

C. Resource Sharing and Networking

Jeevan and Majumdar (1999) highlights in the national conference the feasibility of library automation especially in the usefulness of OPAC and it is continuously exploring new information technology tools and techniques and the online public access catalogue (OPAC) is computerized and can be accessed from the Campus via the LAN/ERNET Wide Area Network, Internet or World Wide Web. A CD-ROM network facilitating access to the earlier stand-alone databases could also, in time, be accessed via the Internet. He outlines the basic steps in designing a Web server for library applications, summarizes the local developments suitable for Indian libraries [28].

Biswas, S (2002) describes experiences in library automation in India and the difficulties in Indian libraries while implementing library automation to exercise the capabilities of software features and its modalities to upgrade library services including skills of library staff to possess automating services including circulation, OPAC, retrieval system and search capabilities [29].

Bhatt, R K(2006) found that libraries and information centers with their diminishing static financial allocations have to consider new ways to consolidate global resources amongst them in order to maximize their limited financial resources. Fortunately, availability of powerful computers at affordable cost, spread of telecommunication networks to remote areas, advent of the internet, increasing interest in creating digital content etc. are now helping the library and information professionals to give answer to the challenges occurring due to the explosion of information and knowledge, increasing cost of library materials, changing formats of reading materials, shrinking of library budgets and the increasing demands of users for information and knowledge. Keeping in view these factors, discusses the concept of resource sharing and the role of library consortia as an effective collaborative approach to face the challenges of the modern librarianship [30].

Rajendiran *et al* (2007) focused on various services to capturing bibliographic information from collections of Web OPAC (Online Public Access Catalogue) and online bibliographic databases for library cataloguing. The bibliographic record for the document(s) to be acquired or catalogued is searched in the Web OPAC or online bibliographic databases that provide machine-readable or tagged records. It highlights the LibSys 5 (Release 5.0) - Library Automation Software, module for bibliographic data import was executed, and the cataloguing data for the 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 [31].

Mehtab Alam and Ansari, Amita (2008) studied 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). Applicability and utility of OPACs in five libraries in New Delhi, namely the Indian Institute of Technology; Jawaharlal Nehru University Library; Dr. Zakir Husain Library, Jamia Millia Islamia; National Information System for Communication and Information Resources (NISCAIR); and the Defence Science Information and Documentation Centre (DESIDOC). The study finds that the OPAC system has changed the traditional concept of access to library resources. It allows simple as well as complex searches. Document access is still one of the most important approaches of users to visit the library, and a study of the effectiveness of an OPAC is useful in this respect [32].

Rajput, Prabhat Singh *et al* (2008) present overviews of implementation of automation in Devi Ahilya University library has 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 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. He examines

the utilization and satisfaction of users about OPAC and highlights the suggestions made by the users for the further improvement [33].

Mulla, and Chandrashekara (2009) conducted a survey to determine the effective use of online public access catalogue (OPAC) at the libraries of engineering colleges in Karnataka. The major constraints for the use of OPAC at the libraries of engineering colleges were found to be 1) Lack of awareness between user communities 2) OPAC is not user-friendly software 3) Information technology (IT) competency between user communities was lacklustre. Thus, the study clearly highlighted the need for an education program module for users to promote the effective usage of OPAC [34].

Selvaganapathi and Surianarayanan (2013) conducted the survey from the faculties of Dr. Sivanthi Aditanar College of Engineering, Tiruchendur, Tamil Nadu, India. Faculties belonging to this college find various improvements required in library automated resources, networking services and also in the aspect of library facilities. This study evaluates how the Library automation and Networking facilities can be used by faculties to improve efficiency and productivity in academic activities [35].

D. Feasibility of library automation modules

Bajaj, R P and Lal, B (1986) envision that technical services of the various modules and its importance in the implementation part, during the library housekeeping activities while the records are transferred into a master file. It discusses the master member, master circulation and inventory files required for automation of the system. They emphasis the data structure of each file, the procedure for updating these files such as addition/deletion of records, and reservation of books in demand. Also, they explain how information like books overdue from members, computation of overdue charges, generation of reminders, is generated from these files [36].

Rao and Ford (1993) explain the primary considerations when choosing software for automating library operations in India, including the availability of the required software. It also describes automation modules which involve various activities of library automation which tells about the integrated packages [37].

Husain *et al*. (2007) explain the importance 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. In India, library automation process started in the last decade of the previous century. It 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 [38].

P G Tadasada (2012) narrates advent of the internet and other ICT tools have enhanced the e-learning and pedagogical learning. There is a demand by a cross section of the profession that Integrated Library Management Systems (ILMS) should be more than what they are today. In fact, the ILMS should integrate the 'Research Support System' and 'Learning Management System' to extend the service effectively. An effort is made in this paper to discuss the features of Learning Management System. It explores some of the issues associated with Learning Management System. It defines Learning Management System, lists its features and discusses the challenges of integration and finally describes the modules of an LMS [39].

E. Academic libraries

Krishnamurthy M (2012) highlights modern academic library is a conglomeration of printed books and journals as well as electronic resources, where both forms of the documents can be stored/archived, retrieved/accessed and delivered/downloaded as and when required. The diversified hunt for information and knowledge, the innumerable books and other printed materials together with endless and ever-increasing scholarly e-resources made the traditional management of library and information centres a difficult target to accomplish. In order to overcome this challenge, newer technologies are being adopted of which, Library automation, networking, the internet, the creation of Bibliographic tools are few examples. Change is the order of the day the world over and therefore, only those will service who have learned the techniques to adapt to a changing and dynamic scenario. In the light of different open source library management software available for providing better access to information resources to the users, librarians need to make use of the same to meet the varied information needs of the users [40].

Krishnamurthy and Meeramani (2012) argued that the library automation ways in which information technology developments have changed the academic library over the last few decades and speculates about further changes to come in an effort to expose the major themes, this article discussing many important issues such as open source technology, policy, and other wishes [41].

Selvi, G T (1999) reviewed the nature of the Internet and the World Wide Web, the services provided and the likely impact of the Internet on academic libraries. It focuses on the kinds of educational information sources available on the Internet as books, research papers, bibliographies and databases, dictionaries and encyclopaedias, maps, electronic periodicals, library catalogues, library reference materials and teaching and learning materials [42].

F. Library automation at Government First Grade College Libraries

The libraries of Government First Grade Colleges in the state need to be automated for effective use of library

facilities by college faculties and students. Computerization not only eases out the job of librarians who single-handedly manage library activities without assistant librarians, it also helps the library in providing better services to college faculties and students. It is also mandatory for any college for undergoing NAAC accreditation/ re-accreditation.

The Department of Collegiate Education, in association with NIC, Bangalore Centre, has successfully automated libraries in two government Colleges on a pilot basis. The e-Granthalaya software developed by NIC was used in the pilot implementation and the software is found to serve the purpose in all respects and the features available are good enough to automate college libraries.

Being a Government of India enterprise, the NIC offers e-Granthalaya software and all its further versions free of cost for government organizations including Government First Grade Colleges. NIC also extends support for software implementation and offers training for college librarians. Hence it is decided that all Government First Grade Colleges must uniformly use e-Granthalaya software for library automation and not proprietary commercial software available in the market.

For the first Phase of automation, 135 Colleges have been identified and the required barcode printers and barcode scanners have been procured as per Higher Education department's technical advisory panel (TAP) recommendations [40].
To proceed further with the process of automation the following steps, recommended by TAP, need to be taken up.

1. Bar-coding of books and creating library book database at colleges suitable for e-Granthalaya software by outsourcing agencies through e-Tender.
2. Conducting two days' workshop for librarians on library automation using e-Granthalaya software including the following aspects.

    a. Familiarization of e-Granthalaya software
    b. Installation and maintenance of e-Granthalaya software
    c. Data entry and maintenance/ management of database
    d. OPAC and Stock verification using e-Granthalaya software
    e. Use of barcode printers and barcode scanners

Identify a librarian in the department who is well versed in the process of library automation using e-Granthalaya software and entrust the task of overseeing the process.

III. CONCLUSION

After examining through various studies on library automation, computerization, integrated library management system and resource sharing and networking; it is found from the study that library automation and related discipline has contributed to the national economy and the betterment of the library professionals of developing countries particularly India by reducing the workload and to provide better and quick service to the library users. The present review study, which covers significant studies on library automation conducted all over the world certainly helped to narrow and to more clearly delineate the research plan, in conducting research on library automation in Indian environment. Similarly, these reviews also helped in determining the degree of library automation in Library and Information Science field that have already been undertaken.

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