CONCLUSION

The idea of taking up this study as a topic of research was conceived in 1994 when only 5 Indian Institutes of Technology were existing and all of them had been in the early stages of computerisation. Having worked as a professional in the central library of IIT, Bombay from 1979 to 1985 the vastness of library system prevailing in IITs was known. Also the problems faced by the staff of library and computer scientists in developing a software for library use in the early 1980’s was known. During the previous decade the libraries of different IITs had succeeded in automating the activities fully or partially and hence there was a curiosity to know about the computer systems developed. Also, during past ten years the movement of automating libraries was in its full swing.

The agencies like University Grants commission, Ministry of Human Resources Development and Councils for Research in various disciplines took initiative, released grants and issued instructions that computer may be used by the libraries coming under their purviews. It is being noticed that librarians of many small and medium sized libraries are facing problems in computerisation for the lack of awareness. Many of them do not know how to proceed for computerisation. What activities can be automated? What infrastructure is required? And which software be used? In some of the libraries computers have been purchased because grants were made available for the purpose, but the computers could not even be installed for some or other reasons. Under this project an attempt is being made to study the development of computer systems in different IITs’ libraries which may be useful for other libraries to seek guidance in developing their own system i.e. Hardware, Software and Humanware. Under Chapter-3 system design for different activities of libraries have been covered and detailed descriptions of files are given. In the same chapter small programs for automating different activities are illustrated and
supported by the flowchart diagrams. These may be useful for those medium and small sized libraries which can not afford to go for costly software packages like Libsys. Such libraries on the basis of developmental growth of automation at IIT Libraries, covered in chapter 4 and 3 of this project, shall be in a position to chalk out a feasible plan for automating their different activities. If the library wish to develop its own software it should be possible for them by taking help of software experts and taking guidance from chapter 3 and 4 of this study.

The hypothesis in present study are being tested whether they stand accepted or rejected. The following are the hypotheses of this study –

1. Automation of Libraries in India is in its cradle stage.

2. The seven IITs are the most advanced centres of study and research and have suitable infrastructure for Automation of Libraries i.e. adequate funds, well qualified staff and well developed computer systems.

3. All the Seven IITs have computerized their libraries for some or other activities but there is not much uniformity in them.

4. The different IIT libraries have a lot of variation in their system-design. This study may highlight the best system-design which could prove as a pioneer for the automation of other Scientific and Technical Libraries in India.

5. IIT Libraries being rich in resources have developed a Network for their use particularly in the field of Science and Technology. They can function well as nodal points for Information Storage and Retrieval.

6. The costs of computerisation, inspite of decrease in prices, are high but the benefits accrued from it are much more.
7. This study would enable to explore the feasibility of automating other large and medium sized libraries.

**Hypothesis – 1**

It is an outcome of observation that only a small fraction of total libraries in India have been automated. Out of the total libraries having computers less than half have computerized their activities and services. In chapter –1 it is stated that less than 10% libraries are computerized. It shows that the automation in Indian libraries is in its early stage.

**Hypothesis – 2**

The data relating to organisation of IIT libraries in chapter –2 of this study prove that these libraries are rich in resources. Table –1 shows that other than the library of IIT, Guwahati (Total collection around 1,00,000 vols) all the other IIT libraries have approx .4-5 lacs of volumes in their collection. Table –2 shows that the minimum number of users in the libraries under study is about 2,000 (Guwahati) minimum and approx. 10,000 (Mumbai) is maximum. Table –3 represented that number of staff i.e. ranging from 26 to 82. All these table and description of organisation and services prove that the libraries under study have a well developed infrastructure.

**Hypothesis – 3**

The description made under chapter-4 reveals that the library of IIT, Kanpur is fully computerized i.e. digital library, the library of IIT, Mumbai has computerized its all the housekeeping routines (except classification) and is providing information through LAN and other networks. IIT, Delhi and Chennai are in the
process of using Bar-code for circulation. IIT, Mumbai is making use of Bar-code for circulation for past 6 years while the IIT, Kanpur has its own software for circulation of books. This reveals the lack of uniformity in computerisation of libraries.

Hypothesis – 4

It has been observed under chapter-4 of this study that the libraries of different IITs has lot of variation in selection of hardware, software and humanware. But there is one similarity in hardware that each of the libraries has atleast one mainframe with 15-25 terminals and 20-30 personal computers. In the selection of software the final choice of IIT, Delhi, Kharagpur and Guwahati is on LIBSYS, while IIT, Kanpur developed its own software under the name iit-KLAS, IIT, Mumbai developed its own software using Fox pro for some of its activities and bought ‘SLIM’ for serial control. IIT, Roorkee uses ‘Troodon’ software package. It is observed that in hardware ‘Compaq’ and ‘LIBSYS’ in software are the common choices. In the same chapter it is also found that there is variation in training of technical staff to work on computers.

Hypothesis – 5

It has been observed that the libraries of IIT, Kanpur, Delhi and Mumbai have developed LAN in their campus and have also got links to ‘Ernet’ and ‘Internet’. The libraries of IIT, Chennai, Kharagpur, Guwahati and Roorkee also have facility of Internet but lack the availability of LAN. Having lots of common in literature and information needs of users in the same disciplines the seven IITs may go for developing their combined network. Each of the Libraries may also function as nodal point in its region. As to this date these libraries do not have any such plan.
Hypothesis – 6

The study made under chapter-5 reveals that the initial cost of computerisation in libraries of IITs ranges between Rs. 15-22 lacs as non-recurring expenditure and approx. Rs. 2 lacs as recurring one which is definitely very high. The benefits calculated in context of IIT, Mumbai show the figure of about Rs. 5 lacs as recurring saving. Thus it is proved that computerisation is also beneficial in terms of memory besides the intangible benefits.

Chapter 1 is concerned with the policy and decision making of automation. It covers the forces behind automation, the activities ought to be automated and feasibility study of automation. Small libraries having a few thousand of books, poor resources, small number or users and one or two professional / semi-professional staff members, may not find computerisation useful and successful. It is expected that the information gathered here would help in knowing that whether the computerisation is suitable or not for a particular library and the individual librarians shall be able to take decision in this behalf by going through this chapter. Chapter-2 of this study describes the organisation of libraries of seven Indian Institutes of Technology. The vastness and variety of collection is evident for it is found that each library has 2 to 5 lacs of volumes in collection which includes books, current periodicals, bound volumes of periodicals, standards, patents, microfilms and microfiches, technical reports, audio/video cassettes, CD-ROMs and motion pictures. The quantum of work load can be estimated by the number of users and the number of volumes circulated (issued/returned) per day. The observation is that the number of users ranges between 5,000 to 10,000 in each of the six libraries except the library of IIT, Guwahati where number of users are about 2,000. The reason is that on one hand IIT, Guwahati got established in 1994 and is comparatively less developed in terms of number of students, teachers
and staff as well as number of disciplines of knowledge. Another factor behind less number of users is that industrialization is still in developing stage in North-Eastern region of India. Table 2.2 of this chapter reveals that the number of users are maximum in library of IIT, Mumbai (Bombay), next to this comes IIT, Chennai (Madras), then Kanpur, Delhi, and Kharagpur have almost same number of users and the library of IIT, Roorkee has below 5,000 users. Though this library is almost 150 years old but due to poor industrialization the number of visitors and corporate members is very less. Hence it may be concluded that the use of libraries has a direct relation to the industries in that region.

In chapter 3 system design for Automation is being covered. The considerations and steps involved in system designing have been narrated in the beginning, then general criteria for the selection of system, i.e. selection of Hardware, selection of software have been taken. Next to this the functions of specific activities as well as the files, directories, data elements and flow-charts are described. It has been concluded that instead of Batch mode on-line data entry and searching has to be preferred, on-line processing is found less complicated, more useful and results into speedy processing. Under chapter 4 the systems available in the seven IIT libraries are studied. It has been analysed that there is a lot of variation in hardware installed, software used and humanware deployed for automating the activities of different IIT Libraries. The libraries of IITs have atleast one mainframe plus varied number of PCs. IIT Kanpur has one Compaq Proliant and 25 PCs of Zenith and Wipro; IIT Delhi has 1 Compaq, 5 IBM and 5 PCL plus 37 PCs with 4 servers exclusively for library; Library of IIT, Chennai has 1 mainframe with 24 terminals and 20 PCs; IIT, Mumbai library has 1 Maxman Pentium mainframe with 22 terminals and 17 PCs; Library of IIT, Kharagpur has HCL-HP, PCL and Meteer-III with 16 terminals and 12 PCs; IIT, Guwahati library possesses IBM, HCL and Compaq and 13 PCs; and library of IIT, Roorkee has 21 Pentium with number of terminals. It can be concluded that to manage the work of
large library systems as that of IIT libraries besides one mainframe computer with number of terminals several PCs are also needed. It is also found that Compaq is owned by libraries of IIT, Kanpur, Delhi and Guwahati and it can be concluded that compaq is most suited hardware for large libraries. The software used by the libraries of IITs also have lot of variations. The library of IIT, Kanpur developed a fully integrated package entitled “iiit KLAS”. This package is developed on ORACLE RDBMS 7.0 Version. It has various modules such as “Lekhya” for acquisition, ‘Suchi’ for cataloguing, ‘Patrika’ for serial control and circulation etc. It is functioning efficiently for last over 7 years. The library of IIT, Delhi first developed its own program package ‘LIS’ in C++ language for housekeeping routines and used micro CDS/ISIS for Information Storage and Retrieval. In 1998 they bought ‘LIBSYS’ and since then using it successfully for all the activities of this library. ‘LIBSYS’ is installed on Windows NT Server. The library of IIT, Mumbai also developed their software packages, using ‘FoxPro’, under the names ‘Pustak’ and ‘Purti’. For serial control when experiments for developing its own software were found unsatisfactory then in 1990 a software package named, ‘SLIM’ was bought and used successfully. The library of IIT, Roorkee uses “Troodon, a software developed on Window. The libraries of IIT, Kharagpur and Guwahati are working on ‘LIBSYS’. Thus it can be safety concluded that out of several program packages ‘LIBSYS’ is most suitable in large libraries.

The study of humanware under chapter 4 reveals that the library of IIT, Kanpur got his all 33 professionals trained to work on computers. In the library of IIT Delhi 27 out of 36 technical staff had been trained to work on computers. The library of IIT, Mumbai has got its total technical staff trained to work with computers and is obliged to put its 39 staff members to operate the computers. The library of IIT, Kharagpur trained 35 out of its 53 staff members to work with computers. This study reveals that the libraries of seven IITs have trained almost
whole of their professional staff and about 60% of the staff are working on computers.

Cost-benefit analysis was a task tough to perform because the data desired to assess the benefits, in particular, was never calculated by the respondents. As such calculating benefits in a non-productive organisation like libraries is a tedious task. The benefits are both tangible and intangible and intangible benefits could not be calculated in terms of money instead they have to be assessed by the satisfaction of users and staff. The costs can be assessed upto great extent. The cost of hardware installed, maintenance charges, money involved on training of staff, cost of software, recurring charges like telephone and electricity bills all can be calculated. Though, most of the questions relating to cost-benefit analysis have been responded but the answers were not upto the mark. The responses from IIT, Mumbai library can be called to be the most relevant one and so the data provided by this library was used as the basis. It was calculated that on a cost of Rs. 17,39,000/- there is a recurring benefit of Rs. 6,00,000 per year. Besides these tangible benefits number of intangible benefits were also observed. The library of IIT, Chennai, though failed to give the exact figures on costs of computerisation but the approx. assessment comes to Rs. 15,00,000. The benefits on the basis of saving of staff the tangible benefits, are calculated to Rs. 3,00,000 per annum. The library of IIT, Kharagpur could not provide any data relating to tangible costs or benefits, but the intangible benefits are there. IIT, Delhi library reported the costs as Rs. 18,00,000 but it failed to give any figures of savings on staff or time. However, the details of new services introduced after computerisation without additional staff makes it evident that there is a saving of atleast 25% on staff. This comes to around Rs. 4,00,000 saving per annum. IIT, Guwahati library reported the costs involved to Rs. 10,000,00 and the benefits, recurring and intangible, obtained by about 50% savings on staff is nearly Rs. 3,00,000 per annum.
It can be concluded that while the costs of computerisation range from 15 to 22 lacs as non-recurring and about Rs. 2 lacs as recurring, the tangible recurring benefits range 3 to 5 lacs per annum. Besides the tangible benefits, the savings of mental fatigue to the users and staff, economy of time in providing excellent and efficient services and sense of satisfaction among the library staff and users are the intangible benefits.

At the end it can be concluded that the libraries having large collection, say above 50,000 volumes, and well trained staff should go invariably for computerisation. If financial constraints do not put a hurdle then LIBSYS software should be bought, otherwise they can develop their own a program package ‘SOUL developed and made available by INFLIBNET can also be purchased and used. Initially the benefits of computerisation may not be realised but the costs involved in automation would be paid back in manifolds in the course of time.