This investigation was started with intention to find out the impact of internet on library and information services with special reference to IITs. To achieve the objectives, the whole problem was divided into two parts- (1) to know the available library infrastructures in IITs for which questionnaire method was followed to collect the relevant information and (2) to collect the publication and citation raw data to study the changes in output, information seeking behaviour; communication patterns etc for which Web of Science and Scopus databases were used. The vast quantities of collected data not only help to know about the library infrastructures of IITs but it also give in details of impact of internet on library and information services, information seeking behaviour, citation pattern, mode of communication etc.

About Availability of Library Infrastructures

The role of library can’t be denied in any academic institution. If an institute is doing well, there is no doubt about its having a good library to support it. Keeping the objectives of study in mind, the services of IITs libraries were evaluated and following results were obtained.

1) The study reveals that almost all IITs are spending less than one fourth of their budget amount on printed books and the major share of remaining amount goes to journals (print & electronic) and e-books.

2) IITKGP and IITB users are heavily depending on their central library where as Delhi, Kanpur and Madras are having their departmental libraries to share the load of the central library.
3) Among the seven IITs, IIT Madras is having better collection than the others where as IITG looks still very young baby but picking up gradually.

4) Collection of patents and subscription of large number of international journals, both print and electronic as well as audio visual materials and microfilm /microfiches makes IITs libraries different than the universities.

5) The Internet has fulfilled the dream of union catalogue and helps a lot in resource sharing through web OPAC, file transfer and downloading facilities.

6) Quite no. of printed journals has been dropped after introducing the internet services and their online versions were taken. Collection of good no. of E-books and consortia databases, both full text & bibliographical are the assets of the IITs library.

7) The users’ dependency on technically qualified staff has increased.

8) All seven IITs libraries are fully computerized and their in house library operations are managed through computers. Their libraries are connected through campus network and Web OPAC services are also provided to the users.

9) The internet based services were proved very much useful and got appreciations from the users where as the traditional services, such as access to library, generating reminders, recent edition list, database searching (off line), content page access, SDI, CAS and literature survey etc. were also very much influenced and enhanced as an impact of the internet.

10) The library image, working efficiency of staff, mode of resource sharing and mode of communication, library policies and rules were got influenced by internet as felt by the IITs’ librarians.
11) The bibliographical and full text databases which were earlier subscribed individually, now it has been made possible to get them on much cheaper rate through AICTE consortia, such as IEL (a full text database) is available on more than 90% discount to the INDEST members and the same is true with the other full text and bibliographical databases (see appendix-2). Thus, it helps the librarian to manage the library within the limited budget.

Thus internet has become an indispensable source of information in recent years and it has impact on some of the major areas of library operations such as library administration, collection development, cataloguing, inter library loan, document delivery service, serial control, reference service, CAS, SDI and many more.

**About Publication and Citation Data**

While studying the publication and citation data it was also observed that internet is having direct impact upon the scientific output, citation, communication and information seeking behavior.

1) All the IITs (except IITG) are listed in 35 most productive institutions of India, 10 of them are of National Importance, 14 universities, and 11 research institutes. The top 35 institutes put together contributed more than 47% of the total cumulative research output by India during 1996-2006. The publication share of these 35 institutes in the total output by India show decline from 50.34% during 1996-1998 to 47.70% during 2004-06.

2) The average publication growth rate of these thirty five institutions during 1996-98 to 2004-06 was 62.71%, only 18 out of 35 institutes shown publication growth rate higher than the 35 institution average. The average citation per paper (ACPP) of these institutions was 2.52. Only 12 out of 35 institutions have shown citation performance above 2.52 and **IIT Kanpur** is
one of them with 2.82. Rests of them are 9 national institutes and two universities. The average h-index of these 35 institutions was 43.26. Only 16 out of 35 have shown h-index higher than the average. **IIT Kanpur (57), Bombay (50), Delhi (50), Madras (49), and Kharagpur (48)** figured in the 35 institutions list.

3) All IITs put together got 6558 and 22792 papers published before (1985-89) and after (2003-07) internet era respectively as seen from the Web of Science. There may be several reasons of high productivity of IITs after the internet era but one of them is availability of current information through net.

4) Scientist got more freedom to select the journals for communicating their research findings (in both print and on-line).

5) The poor citation records of Indian publications had been always a question mark and discussed a lot, nationally and internationally both. The same thing has been displayed about the IITs also. 24% of pre internet era papers in spite of getting longer citation period got zero citation, 46% between 1-5 times, 14% between 6-10 times, 10% between 11-19 times and 6% equal to more than 20 times while post internet era papers in spite of very short period have received better citation as displayed in Table no. 6.4 a-g and 6.5.

6) The unavailability of current information and their referencing is an old problem of Third World countries. The study reveals that due to availability of the current scientific literatures, some changes in the citation behaviour have been noticed. During the pre internet era, IITs scientist cited 42% references having 0-5 years of age, 24%, 6-10 years of age and 33% more than 10 years old. In contrast, during the post internet era, 57% references were of 0-5 years’ age, and 20% were of 6-10 years and only 21% were more than 10 years old. It reflects a clear cut changes in citation behavior of the users due to access of current literatures made available through internet.
7) The subject wise break up study reveals that in the field of Physics & Astronomy, Environmental Science, Mathematics, Chemistry, Earth and Planetary Science, Materials Science, Computer Science and Energy IITs occupy in between 1-10 positions where as in the field of Biochemistry, Immunology and Microbio-logy IITs also do fairly good work, although they are not the subject of their direct interest. In the field of Engineering as a whole, IISc, Bangalore occupy the 1st rank followed by IITD (2nd Rank); IITM (3rd Rank); IITKGP (4th rank); IITB (5th rank); IITK (6th rank), IITR (7th rank) and IITG (13th rank) (see Table no. 6.7).

8) The IITs scientist got their 86% pre internet and 93% of post internet papers published in foreign journals. Out of 93%, 34% papers were published in US journals where as 25% in UK and 15% in the Netherlands. *Journal of Applied Physics (USA), Journal of Applied Polymer Discipline (USA), Current Science (IND) Material Science and Engineering (--- ), and Indian Journal of Pure and Applied Physics(IND) are the premier journal preferred by IITs scientists. The other prominent journals are Tetrahedral Letters (GBR), Industrial and Engineering Chemistry Research (USA), Journal of Material Science (USA), Journal of Nano Science and Nanotechnology (USA), Journal of material Processing (CHE).*

**Testing of Hypothesis**

At the beginning of the problem, three hypotheses were taken and all three were got accommodated in questionnaire form. The received response is in the favour of hypotheses and they were accepted.
Suggestions

Based upon the study, the following suggestions are recommended:

1) All IITs should update their web sites regularly and library related information, such as budget, users’ details, infrastructures, collection breakup, list of publication etc should be given on the web site.

2) IITs should also share and actively participate with other than INDEST consortia, such as INFLIBNET, DELNET etc.

3) IITs should have common library software from the users’ point of view.

4) IITs should start a manpower development programme to train the library professionals of other technical institutions about the exploitation of digital resources.

5) The FRID technology should be implemented in all the IITs libraries.

6) IITs scientist should publish their research findings in Indian journals, to improve the quality of Indian journals and S&T as a whole.