CHAPTER 6

Findings, Conclusion & Suggestions

6.1 Findings

6.2 Suggestions by Respondents

6.3 Suggestions for further Research

FINDINGS, CONCLUSION & SUGGESTIONS

6.1 Findings

This research is to study the web browsing behavior of library user from IIT Delhi, Kanpur and Roorkee and thus understand information need of faculty members, research scholar and students. The study is the quantitative and qualitative analysis of statistics of three highly used IIT libraries - IIT Delhi, Kanpur and Roorkee.

The web browsing facility provides a wealth of information for user and it occupies an important place among various information sources. It is widely used by the users specifically for their study and research purpose and it play an active role in searching information. Study thus reveals the information need of different academic users.

Following methods were used:

- Literature survey
- Question/Interview
- Meeting with the library staff and users
- Survey approach used to collect the data

Data is been collected through Questionnaires and interview. 800 forms in each three IIT were distributed and 622, 596 and 636 forms were received back from the IIT Delhi, IIT
Kanpur and IIT Rorkee respectively. Sample for survey consist of 450 UG students, 498 PG students, 522 Research Scholar and 384 faculty form the three IIT. Three IIT were chosen to do a comparative study across the institution.

Data collected through questionnaires were analyzed creating tabulation, bar-charts and other statistical analysis. The summary, findings and recommendation are based on the analysis of web browsing and information seeking behavior of respondent from the three IIT, focusing on nature information needed as per academic and scholastic requirements, usage pattern, preferences, communication tools used and problem faced in use of internet services.

**User usage pattern, frequency and amount of time spent by user.**

It is clear from table no. 5.1.2 that 89.33% users from IIT have to use web browsing Daily, 8.33% responded to use web. Fortnightly and monthly users percentage is minimum 2.17% and 0.16 % respectively.

Study of table 5.1.4 shows that subject of web browsing is remains Specific in nature for 48.1% respondents. Subject of web browsing for general and other topics is 28% and 23.9% respectively.

Analysis of responses form table 5.1.5 shows that maximum 35.5% users have to give 2-4 hrs. for web browsing in IIT. As this response is same across three IIT this duration is can be taken as general requirement of users. 18% respondent reported to give 6-8 hrs. in institute library.

From the comparative study of table 5.1.3 and table 5.1.5 it was found that 0-1 hrs and 6-8 users where more active on their Institute library network. While 2-4 and 4-6 hrs. Users were more active personal or labs network. As this 2-4 and 4-6 hrs. Combined percentage of this group is 60% and which shows that still library services for web browsing are either not sufficient or popular among majority of users.

As table 5.1.7 Data analysis shows that cyber café is least used by respondents (15.33%) for web browsing. Maximum respondent (50.08%) do web browsing in their home. Other location as library and labs are also popular as 30.58% respondent reports to use it. As per
table 5.1.9 preference of user (42.16%) is to do web browsing in home whereas minimum (9.83%) preferred cyber café. Rest 48.01% prefers library and other services.

It is clear from table 5.1.13 that maximum respondents (40%) use web browsing for work purpose. 24% use it for social networking while 16% reported to use for mail purpose and Least 7% used for gaming.

**Awareness of e-resources.**

On the basis of data analysis shown in table no. 5.1.10 that overall maximum respondents (33%) reported to search e-journals. From analysis of table it is concluded that Research scholar and Faculty members browse more often e journals whereas under graduate and Post Graduate students browse more e books and websites.

As table 5.1.11 data analysis shows that (36.33%) respondents have accessed e-journal database more often. Only 13.16 respondents reported to use CD ROM database and it is lowest among all type of e-resources in use.

As table 5.1.18 shows that criteria for judging the information is Title (35.67%) and Description (34.5%) is more preferred by respondents that URLs and is least preferred (14.33%).

**The extent of awareness of web browsing.**

On the basis of data analysis shown in tale no.5.1.17 that Advanced Search is required for most 42.16% respondents while 34.67% is find basic search sufficient for their needs. Only 10.5% respondent used web directory search and it is thus least used. Most respondents across all IIT reported to be most of time using web search engine to get information they need. Web directory based and query is less common. As a result we see from Table 5.1.14 Google is still most relevant information source than Yahoo or bing which are web directory or combined search providers.

It is clear from table no. 5.1.21 that unsatisfaction level is higher from Undergraduate and Postgraduate students comparative to research scholar and Faculty members. It shows there is greater need to help this group to get the information they need. As per table 5.1.6 most of
the web browsing session is for class assignment and research for all IIT users except Faculty members who have to give lesser time to this but then they devote more time to research and communication. Entertainment and communication also is enabled to a good extent through web browsing.

**Nature of information required**

Data analysis shows that there is a great variation in the web browsing behavior of IIT Delhi, Kanpur and Roorkee library users. Data analysis of table 5.1.6 shows most of the UG students of IIT Roorkee depend on Web browsing to complete their class assignments while students of IIT Kanpur and IIT Delhi are more dependent on offline modes to complete assignments. It also shows greater adoption of online facilities among IIT Roorkee library user. UG students tend to seek General information more often than others. Information need of this group is least for research.

PG respondent’s web browsing session are majorly utilized for class assignment and research where IIT Delhi PG students are exception by least using web browsing for research (14%). Within this group least usage of web browsing is for downloading software and News/current affairs, as a result we find in comparison to UG students PG students are more dependent on web browsing for their research information needs.

Study also shows that across all three institutions, UG students used web browsing mostly to complete class assignments and least used for research.

It is found that Research scholar maximum web browsing session is for Research where Roorkee leads (40%) followed by IIT Kanpur and minimum 30% from IIT Delhi. Among this group least browsing session is for current affairs. Information in table also shows that research scholar web browsing session is mostly used for research.

It is found form response of faculty members that their most Web browsing session is for research and least is for software download. Reason for their behavior is high requirement for teacher to remain updated as per current improvement in technology and science in the world.
Nature of information from table 5.1.1 shows that though highest percentage (30.67%) of user seek research information they equally need current (24.1%), every day (23.3%) and general information (21.58%) also. UG students tend to seek lesser research information and Faculty members tend to seek least Everyday information.

**Use of Communication tools, email and web browsing preferences**

Data analysis from table no. 5.1.19, found that 34.8% of respondent from all category rated World Wide Web usage highest and it shows their greater dependence for information on the web. 29.67 percent found Email as most indispensable tool for them. 10.3% of the respondent found chat discussion as preferred mode of communication. UG and PG students and Research scholar gave more importance to chat discussion whereas Faculty gave more importance to steaming video in response to indispensable communication technology. Streaming video is rated by respondents as least (12%) indispensable technology.

As table 5.1.14 shows that Google search (67.7%) is most important. As per table 8.1.16 Chrome is been found to be largely prefer 63.16%. Followed by Mozilla (14.33%), Opera (9.5%), MS Explorer (8.83%) and others (4.18%).

As table no. 5.1.16 data analysis found that appealing features of the search engines to the user’s maximum ease of use (26.8%), followed by Speed (21.85%), relevance (11.67%) and reliability (11%) and minimum preferred feature that could be compromised is durability (3.35%) and familiarity (5.67%).

**Preferred information from Web Browsing**

Data analysis of table 5.1.6 reveals that maximum 26% respondent use web browsing facility to complete Research work. PG students, Research scholar and Faculty members are most active in research and UG is least active in research.

Second highest preference of respondent is about class assignment. Preferred information from web browsing is related to Class assignment is maximum (46%) for UG students from IIT Roorkee. Lowest number of respondent preferred web browsing for downloading software (10.67%). As nowadays Applications run online on browser itself, without
requirement to download them.

**Problem faced by user in use of internet service**

On the basis of data analysis shown in table no. 5.1.20 shows, user faces all the problems listed in Questionnaire but most (19.75%) of the UG students, PG students Research scholar and members of faculty reported to many junk sites as main source of problem for them while searching for information they need.

IIT Kanpur UG students reported highest (30%) problem with too many junk sites but other group of IIT Kanpur suffered from this problem to a lesser extent. This could be attributed to the more general nature information this group tend to seek as discussed in above section.

Another major problem faced by UG and PG students and Research Scholar is not getting the information they seek on internet (15.5%). IIT Roorkee UG students (26%) responded to face this problem while IIT Delhi student face this problem least (10%).

Form Study is found that (16.67%) research scholar faces difficulty with efficiency to organize the information they gather. Sites with too many useless graphics were reported as problem by 11.41% users.

Research scholar and Faculty Respondents also reported higher Percentage of problem with getting errors from pages that they use comparison to other groups. Least number of respondents (8.91%) faced Pages with bad HTML error.

**Satisfaction from the information retrieved through web.**

As table no. 5.1.21 shows that 47.7% respondent reported to be satisfied while 29.5 % reported to be totally satisfied with the information the retrieved from web. 10 % reported ambiguity and only 5% respondent reported they could not retrieve information they needed. Analysis shows PG student and research scholar are more unsatisfied with the information retrieved through web in comparison to UG students and faculty.
Satisfaction from library services

It is clear from table no. 5.1.12 that 35% respondent rated library services as good and 25.17 rated library services as very good. 6% respondent reported library services as poor. Study shows that UG students are not that much satisfied with library services as are Faculty members. This fact points out that resources available to UG students are not sufficient. It is also found that IIT Roorkee library users overall satisfaction is highest and IIT Delhi is lowest as per table data.

As table 5.1.26 shows that 59% users reported to be satisfied, while 33.3% said they expect more improvement and 7.7% users reported to be not satisfied. Faculty members seem to be most satisfied and none from this group reported to be not satisfied with library services. Undergraduate students from IIT Delhi (20%) maximum reported to be not satisfied.

From the above findings

It is found that users accepted that web browsing is not without problems. These difficulties and problems depend largely on technical infrastructure and library usage strategies adopted and followed by the organization management and users. Now a day on web, a lot of e resources available for the users, still it is found that UG students in particular face problems while using such resources so library management need to make some strategies for students whereby the user more aware and informed about such resources. Example could be better usage of institute bulletin boards to popularize latest content available on these e-resources and thus trying to generate interest of the students and promote them to use these e-resources. The main technical problem with the web browsing is that most of users feel that it to many junk sites and then not being able to find the information they are looking for, also features so that they could efficiently organize the information they gather and enhancement/upgrade of browser/software’s installed on machine on regular basis so that user do not face slow loading problems in sites with too many useless graphics as now a days latest browser are capable of lighting down the pages if network is slow and thus help in loading of pages.
Study has shown that most users have to use web browsing regularly. The respondents most of time seek for specific information related to their subject areas hence it is very essential that libraries and its management should remain updated with change in needs of students. It is required that students get 24/7 access to web in library and also proper guidance to use of material related to their subjects particular for UG students.

Management should plan for enablement sessions for the students at the very beginning when students join the Institute and explain to student’s features and usage to web browsing in current scenario and how it will help them. This could be further followed by few more enablement sessions for specific tools and websites which library management feels students should be aware of for their current academic needs.

It is evident that library management is more focused on maintain library but explaining and guiding the students is left out job and management is not visualizing its importance for user. Sessions to educate students about library decorum and also current facilities should be must.

It is required that library network should have enough bandwidth and resources so as to give acceptable speed and reliability to users.

Library user social networking institute level website should be there where students could give share suggestions, experiences rating to contents and students could get online guidance from library management for their queries.

Institute level social networking group should be further strengthened. In similar line with alumni connect programs, there should be online faculty connect platform for faculty members also where in sharing of knowledge among teachers and students could grow further.

6.2 Suggestions by Respondents

Following are suggestions given by respondents.
IIT DELHI

Undergraduate Students

a - Increase the duration for using LAN in hostels

b – Increase the WIFI –field in campus

c- In library PCs data saved gets deleted in soon as you log out. Save times, if I have to leave for an emergency purpose, I need to Pc download my data better speed.

d- Improve the data line

e- Here should be a system for sharing allotted usage of internet proxy

f- Improve academic sites

g- Improve Wi-Fi network

h- Academic site performance must be improved speed be increased to 100MBPS

I - Higher bandwidth 12.5 MBPS

J- Wi-Fi stored be installed in routers too, Better connectivity

Postgraduate Students

- More on line tutorials

- More routers for fast connections

- Should be unlimited per student speed up the wifi connection increase the proxy quota

- Remove data utilization limit

- Increase number of PCs
Research Scholar

- Wifi connectivity should be improved
- To increase the PCs for the users
- To access more Journals and e-books

Faculty

- To improve the speed of Internet
- Replace the old system
- Provide more resources

IIT KANPUR

Undergraduate

- Provide access to more e-Journals
- Maintain online intranet database of thesis, seminars and dissertations
- Add more proxy address
- Blocking unusual sites
- Wi-Fi facility should be improved
- Lifting of restriction on certain issues.
- Proxy support should be extended to connections.
- Increase bandwidth
- Updating of software
Postgraduate

- More speed should be available
- Server should be increased
- Add more e-books and Journals

Research Scholar

- Requires more speed for download
- Nature News
- To add more tutorial classes

Faculty

- Increase speed of Internet
- Blocking Unusual sites

IIT ROORKEE

Undergraduate Students

- Upload more information on web
- Keep up to date all database
- Provide better e-mail service
- Improve speed
- Available of more bandwidth
- No sites should be banned
Postgraduate Students

- Better speed and connection
- Avoid too many junk sites
- Useless graphics in sites
- Installation of new server
- Increase of band width

Research Scholar

- Improve the internet speed
- More wi - fi devices
- Increase the collection of e- Journals
- More speed option for both LAN & Wi - fi
- Unlimited download
- Remove the Junk sites

Faculty

- Speed can further be improved
- Replace the old systems
- Increase the internet capacity in order to increase the speed & download
IIT KANPUR

Undergraduate

- Internet Speed should be fast
- Internet Speed should be fast
- Effective connectivity
- To add more PCs
- Upload latest software

IIT ROORKEE

Undergraduate

- Internet speed should be proper at every time.

- Web browsing is quite easy in this library, but sometimes, its speed decreases due to overload, so this should be improved so that overwork does not effect speed of internet connection

IIT DELHI

Postgraduate

- Occasionally internet speed is very poor. So we cannot download paper or browse a site properly if may be due to more load as no of students in library increase, so important is internet speed will be great.

- Internet facility is very good, but some time wifi creates problem many sometime less speed and unable to connect at once otherwise web facilities is above satisfaction level.
IIT KANPUR

Postgraduate Students

- Wifi needs to be improved
- Sometimes, it takes too long to view some pages.
- Speed of net browsing should be increased, Access of books should be increased
- During downloading video, many irrelevant sites referred by search engines I requiring sign up, are junk sites, so also same video, requiring software download, if so some method to prevent it. Knowing in brief before opening a site what’s inside it.

IIT ROORKEE

Postgraduate Students

- Speed of internet is very slow and all computers is not working properly, so these computer should be change. All software should be installed in each computer.
- Numbers of computers in the library should be increase.
- So many junk sites available
- Speed is slow should be improved
- Many sites regarding job openings open this form in only internet xplore, so they should be open on other browse.

IIT DELHI

Research Scholar

- Wifi connectivity should be improved
- E- Books in PDF format with read only access by authorized proxy username and
password.

- Internet speed in the library is very poor & need to be improved. More wifi devices use required in the overall campus.

- Searching feature should be improve, so that desired material/ article can be obtained quickly

- Speed must be fast

- More article/ Journals/Books subscription should be there.

- Issue with speed, sometimes, it takes too long to view some pages

- Facing serious problems because of adds-on, even I am disabling this, those I will appear again & again.

- Upload file size has to be improved in gmail.com

IIT KANPUR

Research Scholar

- We need better Wifi connectivity in library. As number of wired net connections are limited, we spend most of our time in library for our thesis it will be helpful if we could use wifi on our systems properly while we use in library using wifi

- The Wifi connectivity of internet should be improved, Internet in the library is very slow. It takes too long to open website’s page.

IIT ROORKEE

Research Scholar

- We need to improve the faster wifi at library, please introduce the UMS (University management system, which helpful for uploading the attend ones through online and sharing the new research ideas from the foreign and central university professors.
• The number of computers available in the library is not sufficient. It needs to increase the number for more of students to use it.

• To improve the web management and library database.

• Include the subscription of more number of journals, research, and magazines such as JAP, JOLPE etc.

• Please remove/block the junk websites.

• Improve the internet downloading speed.

• Online access of e-books.

• Information about the workshop, conferences, and seminar talk for better research environment.

IIT DELHI Faculty

• Access to more journals/online libraries.

• Ability of content management systems.

• Safety should be prime job during accessing & mailing any site as well as during its use.

• Web speed should be fast.

IIT ROORKEE Faculty

• There should be a download limit for each student attached to his unique ID, for this user must be given unique ID through which they access browsing inside the campus.

• User with LAN tend to download more, overall speed decreases students with wifi suffer, hence these should be uniformity either complete LAN or complete wifi.

• High speed internet should be available.
- Increase the online security of browsing users Default scan by antivirus & protection of PC.

- Speed up the internet improves productivity.

**SUGGESTIONS BY THE RESEARCHER**

While evaluating the information retrieved through web browsing these three aspects are essential: interface design, system performance and collection coverage. Consideration of these three elements and training the user on these aspects will lead user to be able to find latest and relevant information.

Also Library Professional will be able to take initiative to improve the web browsing processing among library users. These imitative could be in terms of formal and informal training for user specific to information sources skills. Librarian should maintain a record of subject websites that are useful to research students and could make sure that every user is able to access this list by using methods like mails to all registered library users, using bulletin board, or publishing online dashboard for users.

To avoid difficulty accessing web browsing at peak hours the timing of the web browsing should be extending round the clock.

Web browsing facility like as bandwidth should be increased if user reports slow download times.

It essential that software on library system is latest and so a periodic software update for all the system should be scheduled. Most of time even browsers are not updated so a centralized software management for all library system should be monitored.

Need for formal training for web browsing techniques, need for high bandwidths for speedy data transmission.

Library staff should come forward to give web browsing facility studies on the scenario.

Web browsing users are required to know its latest trend and development for effective
satisfaction of information needs.

Institute management should make policies to web browsing for the entire user, like as time availability for students thereby they use the web browsing for their required information.

Web browsing for only entertainment should be locked so that users should not unnecessary site on systems.

There is a need to under study on information seeking behavior of users on the web as well as information use on the internet by the library users.

TESTING OF HYPOTHESIS

The objectives of this research study and the hypothesis presented in the previous pages, it studied pragmatically and strategically, it will be found that the findings links up with the objective of the research and the associated hypotheses.

The hypotheses of the present study are being tested where they stand accepted / proved or not. The following hypotheses are intended to be tested

H1 There is a significant difference in the web browsing behavior among library users

H2 The users have considerable awareness about library facilities

H3 Library users are satisfied with internet facility

H4 Users get quality information through web browsing

H5 The information needs and reading habit of users vary because of their different level.

HYPOTHESES 1

It is evident from table no. 5.1.1, table no.5.1.3, table no.5.1.4, table no.5.1.5, table no.5.1.6, table no. 5.1.11, table no. 5.1.12, table no. 5.1.18, table no. 5.1.21, and table no.5.1.23 the most of the user significant difference their web browsing behavior among library users of all three IIT.
So the hypotheses no. 1 is proved true.

**HYPOTHESES 2**

It is clear from table no. 5.1.5 and table no. 5.1.13 the maximum users have considerable awareness about library facilities. Thus the hypotheses no. 2 too proved true.

**HYPOTHESES 3**

It is evident from table no. 5.1.22 and table no. 5.1.27 the most of the user of all three IIT i.e. IIT Delhi, Kanpur and Roorkee maximum respondents are satisfied with internet facility. Therefore the hypotheses no. 3 too proved true.

**HYPOTHESE 4**

It is evident from table no. 5.1.4 and table no. 5.1.11 the most of respondents get quality information through web browsing.

So the hypotheses no. 4 is proved true.

**HYPOTHESES 5**

It is clear from table no. 5.1.1, table no.5.1.4, table no.5.1.11, table no.5.1.19 and table no. 5.1.20 that the maximum respondents of all three IIT information needs and reading habits of users vary because of their different level.

So the hypotheses no. 5 is too proved true.

**AREA FOR FURTHER RESEARCH**

Present research is limited to scope in terms of user group, institutions, faculty, Research Scholar, Postgraduate and undergraduate student, in present study data reflect so many facts as mentioned above even though so many aspects is not included due to time constraint and limited resources that will be taken in phase wise further study in future.

The Web browsing behavior of different level of users, subject wise, web browsing pattern and their comparative study along with appropriate networking model and related aspect will
be incorporated for the education field of other IITs.

- Information use pattern on the web by the library user
- Information seeking behavior on the web
- Number of IIT can be increased for the web browsing behavior study
- Information literacy skills of the library user
- User friendliness and effectiveness of search engines