

**USE OF WEB RESOURCES BY RESEARCH
SCHOLARS IN SELECT INSTITUTES OF J&K
AND DELHI**

Thesis
Submitted to
The University of Kashmir



Degree of
Doctorate of Philosophy
In
Library and Information Science
BY

Tabasum Maqbool

Under the Supervision of
Prof. S.M. Shafi

**DEPARTMENT OF LIBRARY AND
INFORMATION SCIENCE**

University Of Kashmir

Srinagar – 190006

October, 2010

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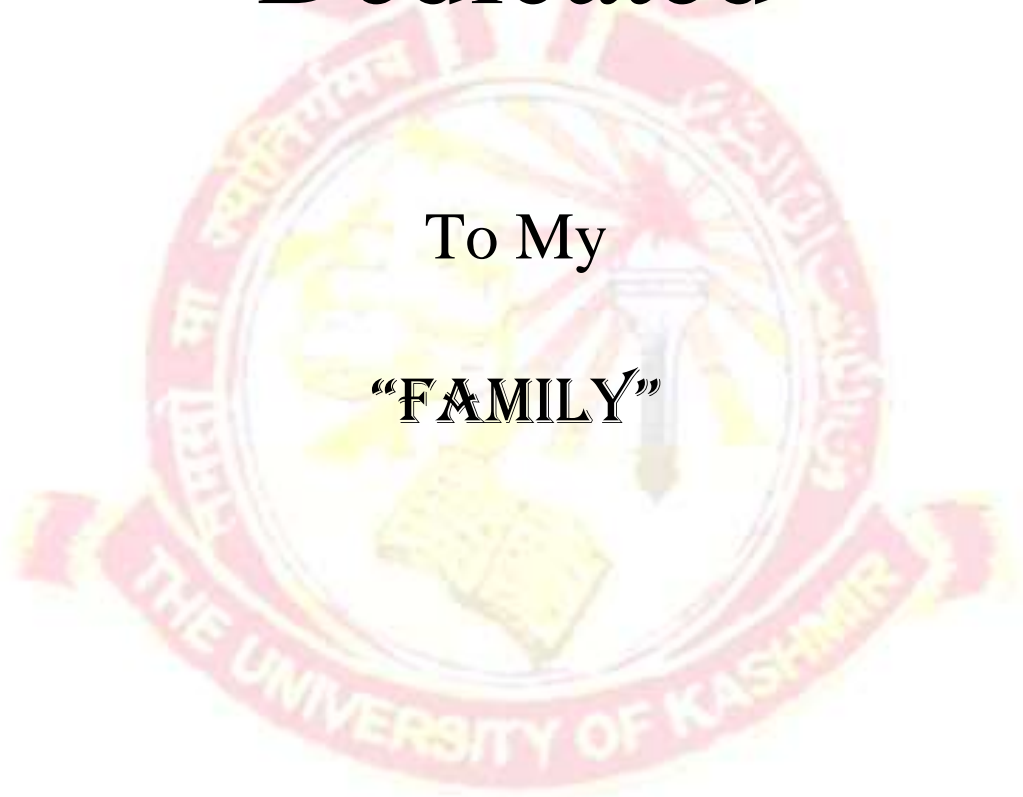
**Department of Library and Information Science
The University of Kashmir, Hazratbal, Srinagar, 190006**

October, 2010

Dedicated

To My

“FAMILY”



Department of Library and Information Science



UNIVERSITY OF KASHMIR
SRINAGAR (J&K)

CERTIFICATE

Certified that the work entitled *“Use of Web Resources by Research Scholars in Select Institutes of J&K and Delhi”* is the bonafide work of *“MsTabasum Maqbool”* conducted in Department of Library and Information Science, University of Kashmir, Srinagar under my guidance and supervision, Prepared exclusively in partial fulfilment of the requirement for the award of Doctorate of Philosophy in Library and Information Science.

Date: October, 2010

(Prof. S. M. Shafi)

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UNIVERSITY OF KASHMIR
SRINAGAR (J&K)

DECLARATION BY INVESTIGATOR

I declare that the Thesis entitled *“Use of Web Resources by Research Scholars in Select Institutes of J&K and Delhi”* is an original piece of work carried out by me for the award of the Degree of **DOCTOR OF PHILOSOPHY** at University of Kashmir in the Department of Library and Information Science.

The work embodied in this thesis has not been submitted for any other degree of this University or any other University.

(Tabasum
Maqbool)

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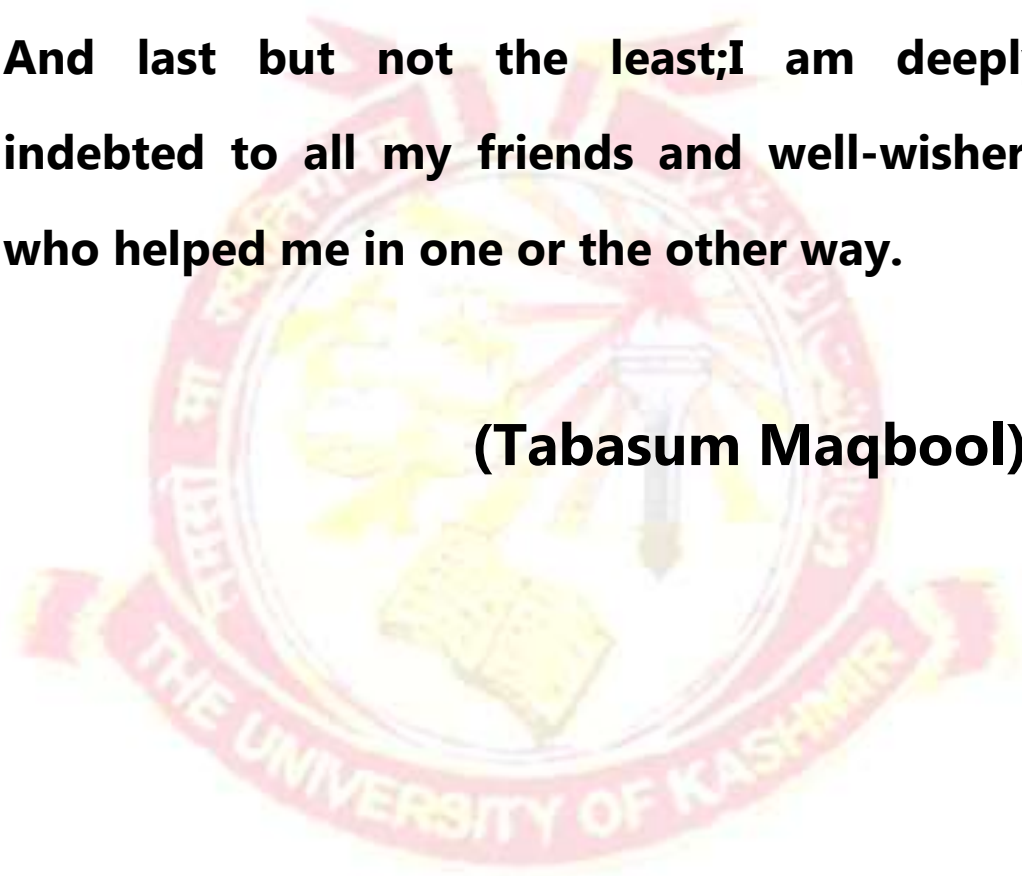
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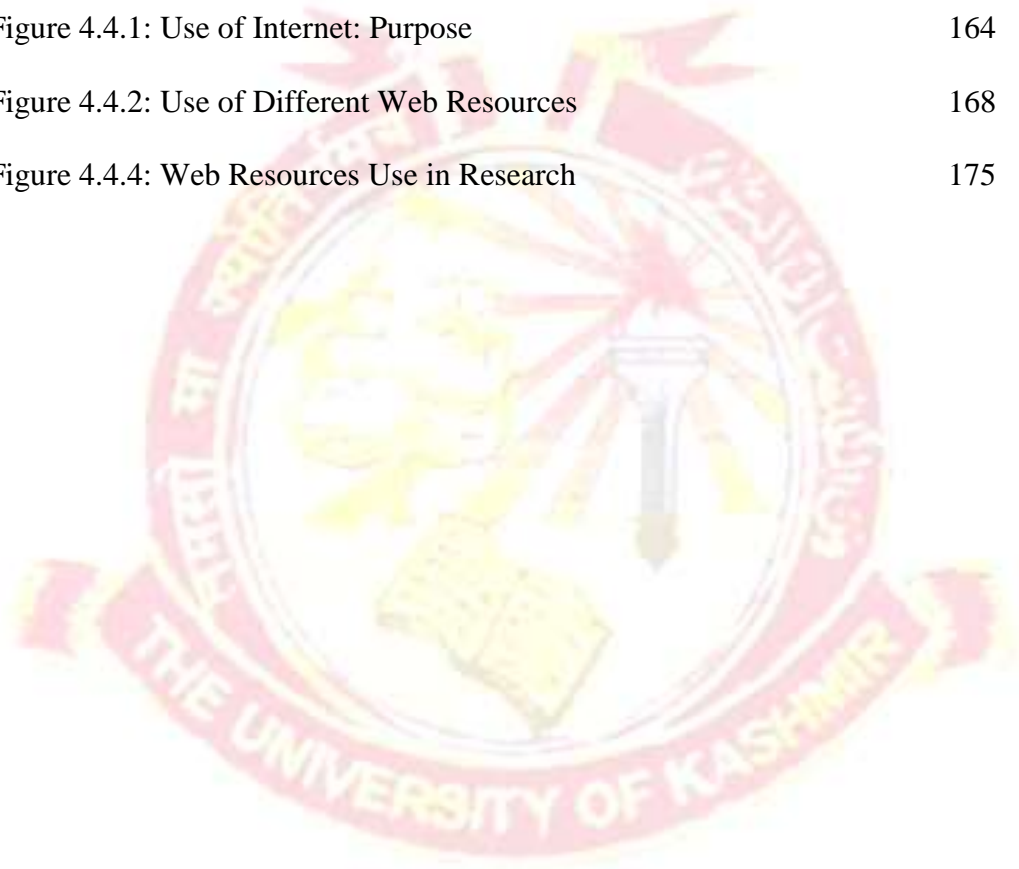
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List of Abbreviations

Abbreviations	Definition
IGIB	Institute of Genomics and Integrative Biology
NISTDS	National Institute of Science, Technology And Development Studies, New Delhi
ICSSR	Indian Council of Social Science Research
CWDS	Centre for Women's Development Studies
IEG	Institute for Economic Growth
ICMR	Indian council of Medical Science Research
NIMR	National Institute of Malaria Research
NIT	National Institute of Technology
SKUAST-K	Sher-i-Kashmir University of Agricultural Science & Technology, Kashmir
SKIMS	Sher-i-Kashmir Institute of Medical Sciences
IIIM - Jammu	Indian Institute of Integrative Medicine(IIIM), Jammu
JNU	Jawaharlal Nehru University
AIIMS	All India Institute of Medical Sciences

Summary

Web resources are fast becoming mainstay for sharing of intellectual output throughout the globe with little limitations and numerous benefits that surpasses all mediums of communication of scholarly content known to world so far.

The study has made a strenuous effort to know the awareness, use and acceptability of web resources among research community of select institutes in Jammu & Kashmir and Delhi.

The present study is spread over five chapters and three appendices discussing various facets of the theme.

The first chapter introduces the study and reveals various objectives, scope, terms used in the research topic and the methodology applied to reach the logical conclusion. Chapter II makes a comprehensive endeavour to delve deep and ferret out literature related to study and correlate with a view to evolve a broad strategy for smooth sailing of the present study. The subsequent chapter deciphers the evolution of web and different types of web resources (like Online Journals, E-books, ETDs, Wikis, Blogs and Databases) and focuses on some of the comprehensive and effective web resources known so far in detail.

Chapter IV is the crux of the study which analyses the collected data pertaining to different parameters (like web awareness, use,

identification of web resources, degree of satisfaction and impact of web resources on libraries) in detail and interprets them by various dimensions. The study also made strenuous efforts to correlate findings with related literature to reach logical inferences. Furthermore, study also applied the chi square test on the collected data to observe the pattern of web resources use among the research scholars of different institutes.

The last chapter presents the findings, tests the hypotheses and discusses various suggestions on the basis of conclusions reached. Besides, it brings to fore the various upcoming areas in web resource use and need for future study in these areas.

The thesis also includes three appendices containing two questionnaires employed in the study and a comprehensive bibliography of information sources consulted during the study.

INTRODUCTION

Information is most important commodity and most of it is now being delivered digitally. With the emergence of information communication technology (ICT) the ways to generate, collect and access information have drastically changed over time. The ICT has given us many tools to access the information and most favourite is the Web. The World Wide Web or simply Web, a product of the continuous research for innovative ways of sharing information resources, allows user to access information stored elsewhere. It is currently the most advanced, useful and powerful information system, constantly influencing the development of new modes of scholarly communication; with potential for delivering goods quite vast and to overcome successfully the geographical limitations associated with the traditional media. Further, the distribution time between product publication and its delivery has been drastically reduced. Web has become a virtual library for every subject in electronic era by providing information generated by different research centres and individuals all over the world. Numerous resources, available on the Web, can be browsed for sharing and accessing information simultaneously by any number of users. The web resources support multimedia information and possess different searching capabilities. These are important features for researchers who always need precise but exhaustive information.

Web resources available are of different types like e-journal, e-books, ETDs, online newspapers, wikis, blogs, manuals, databases etc. E-journals are an important primary source of scholarly information largely fee based. A sizeable number of free open access journals have also emerged which is evident from directory of open access journals (DOAJ) listing 5112 journals in different fields of knowledge (DOAJ, 2010).

The digitization of books and their availability on the web has also become a popular phenomenon of providing books by a click of a mouse e.g. Google has provided a new service known as Google book search under which it is providing

access to digitized books of 28 libraries. It scans all or portions of their collections and makes those texts easily available on web. The book search interface is now available in 35 languages. Over 10,000 publishers and authors from more than 100 countries are participating in the book search partner Programme. **(Google Book Search, 2010)**

Theses and conference proceedings which were earlier confined to the libraries are now available online. Now hundreds of repositories are hosting these materials. Repositories have been developed by universities and research institutes around the globe which unlock ETD's for use by researchers without any barriers. The famous among them are Virginia Polytechnic Institute, University of Southampton, Australian Digital Thesis Programme and Networked Digital Library of Theses and Dissertation. NDLTD **(2010)** under a single platform provides access to over a one million theses in different fields from all over the globe. In India Vidyanidhi **(2010)** alone provides access to 5000 full-text doctoral theses in various subjects of Science and Social Science.

The emergence of different web resources has accelerated the pace of research and development. The scholars can now access variety of resources at the click of the mouse. Web resources have resulted in great educational progress to help users to find and use online information regardless of where the users or information itself is physically located. The demand for, and use of, web resources is growing rapidly, particularly among research scholars because these have resulted in smooth flow of information which helps them to keep a track of developments in their own fields.

In this milieu, it is necessary to know the impact of web resources on research community and make an endeavour to understand their level of awareness, use and satisfaction with these resources. The proper understanding of use and awareness of these emerging information resources shall help stakeholders to devise future plan of action for better and exhaustive use of the resources by the users in general and research community in particular.

1.1 STATEMENT OF THE PROBLEM

The web made new forms of scholarly publications useful for scholars throughout the globe. It has an impact on the conduct of research in all academic and research institutions. Thus a need arises to explore the awareness, use and utilization of web resources and assess its impact on conduct of research and consequently the impact and preparedness of libraries to face the challenges posed by it. It has also given rise to new tools for information management in library & information resource centres. The whole canvas of this development from emergence, use and impact forms the core of the problem for the present study and research.

1.1.1 VARIABLES IN THE PROBLEM: DEFINITION

Web Resources: Web is an interactive service of internet which gives users access to a vast array of documents linked to each other by means of hypertext or hypermedia links. The various types of documents available in web are known as web resources. The present study limits them to different resources used for education and research accessible in the form of online books, online journals, Electronic Theses and Dissertations (ETDs), databases, wikis and blogs etc.

Select: Selection literally means to choose a small number of things, or to choose by making careful decisions. Bearing the fact in view that a large number of universities exist and research institutes are run by CSIR, ICSSR and ICMR established in states of J&K and Delhi. It is not possible to study the users and libraries of all these institutions in the study. Therefore, to make the study manageable a limited number of institutes are selected with the help of stratified random sampling.

Impact: The impact is the powerful or dramatic effect (both positive/ negative) that something or somebody has on a product or a process. Hence, here the effect of web resources is assessed on the user community and libraries.

Preparedness: Preparedness is the quality or state of being ready. The present study attempts to gauge the level of preparedness of select universities and research libraries in order to cope up with the user information demands in terms of better ICT infra-structure, sufficient budgetary allocations for web resources, different innovative operations and services etc. offered by them.

Use: Use is to put something into action or service for achieving desired goal. The study makes an attempt to identify the use of various types of web resources and services by the research scholars of different institutes in two states.

Awareness: awareness is the knowledge or understanding of a subject, issue, or situation. In this study the investigator attempts to discern the awareness level of different web resources among research scholars.

Identification: Identification is the process of discovering or mining objects that one is in need of. The study here made an effort to know different means and tools by which various types of new web resources are being looked for or discovered by research scholars.

Satisfaction: Satisfaction is the feeling of pleasure or contentedness that one gets when he/she achieve or obtain something that he/she want. The study made an endeavour to understand the level or degree of satisfaction of researchers with different types of web resources and their features.

1.2 SCOPE

The scope of the study is limited to use of web resources by research scholars of select universities and research institute associated with CSIR, ICSSR, ICMR in J&K and Delhi. A total of Fifteen (15) institutions are selected for the study, out of them three from CSIR family (IGIB, IIM and NISTDS), two from ICSSR (CWDS and IEG), and one of ICMR (NIMR). The other institutions included are six universities, one premier State and two national level institutes. The institutes chosen were selected on the basis of stratified random sampling. The mechanism of selection is discussed under heading **selection of institutes**.

The study is further confined its scope under following parameters:

- a) Identification of web resources & services
- b) Awareness level of web resources
- c) Use of web resources
- d) Degree of satisfaction with web resources and their
- e) Impact and preparedness of libraries

1.3 OBJECTIVES

The objectives set for the study are:

1. To identify web resources used by research scholars of select research institutions.
2. To identify awareness of various web services used by research scholars for exploring relevant information.
3. To assess use of web resource by scholars in pursuance of their research projects.
4. To gauge satisfaction of research scholars regarding the content, delivery and adequacy of information in web resources.
5. To study the impact and preparedness of libraries to face the challenges posed by web resources in terms of infrastructure availability, selection of web resources, budgetary allocations and services to meet the expectations of users.

1.4 HYPOTHESES

In the present research study four *null hypotheses* (H_0) are formulated with *alternative hypotheses* (H_1) (based on research findings obtained from earlier studies).

Hypothesis I

H_0 = Email like other internet services is used equally by research scholars of different institutes.

H_1 = Email is most popular service among research scholars of different institutes.

Hypothesis II

H_0 = Scholars of different institutes do not identify URLs of new web resources mainly by search engines.

H_1 = Scholars of different institutes identify URLs of new web resources mainly by search engines.

Hypothesis III

H_0 = Use of print & web resources among research community is similar in different institutes.

H_1 = Use of print & web resources among research community is not similar in different institutes

Hypothesis IV

H_0 = Scholars of different institutes perceive that web resources and traditional resources are equally comprehensive.

H_1 = Scholars of different institutes perceive that web resources are more comprehensive than traditional resources.

1.5 METHODOLOGY

In order to achieve the set objectives the methodology employed for the present work consists of following stages and phases.

1.5.1 Review of Literature

In order to pursue research on scientific and logical basis a thorough review of relevant literature was made. The literature was retrieved both from print sources of information as well as online primary literature. The literature helped to understand the problem in detail, besides finding gaps in the study to help to evolve a better methodology to proceed further on scientific lines.

1.5.2 Questionnaires

The literature retrieved in turn helped in designing two comprehensive questionnaires for the present study. The two structured questionnaires thus evolved for achieving the set objectives are:

1.5.2.1 Questionnaire for Scholars

A questionnaire addressed to scholars was designed to gauge their awareness level, identification, use and level of satisfaction with the web resources (**Appendix - I**).

1.5.2.2 Questionnaire for Libraries

Another questionnaire addressed to libraries was framed in order to know the impact and preparedness of libraries to face the challenges posed in terms of infrastructure availability, selection of web resources, budgetary allocation and proactive services to meet the expectations of users (**Appendix - II**).

1.5.2.3 Pilot Questionnaire

The questionnaires designed for scholars and libraries were tested for possible shortcomings. This was done by distributing it among few scholars and libraries to check the accuracy and effectiveness of the questionnaires. Accordingly

necessary modifications were made to the questionnaires to make them more accurate and effective.

1.5.3 Selection of Institutes

In view of the fact that the educational and research institutions of the two states are geographically spread on a large area it is not possible to undertake study of all the institutes for time and financial constraints. Therefore, select institutes (at least 33%) from each stratum were taken into study depending upon the size of the stratum. To achieve this, stratified random sampling was employed for selection of institutes.

The research and academic institutes of two states were first divided into different strata depending upon the type and parent body of the institution in each state. Subsequently, the random values obtained (using “RAND” (Shift+RAND) function of scientific calculator) by dividing the total number of institutions in each stratum & the remainder of each division was taken as sample i.e. institutes selected according to their serial number assigned after arranging them in alphabetical order.

1.5.3.1 Delhi

The higher educational and research institutes in Delhi consist of different strata under CSIR, ICMR, ICSSR, Universities and National Level Professional Educational Institutes. The following tables show in detail the number of institution under each stratum and sample size of institutes selected along with the values obtained through stratified random sampling to evolve a list of select institutes in Delhi.

A) CSIR Institutes in Delhi

Total Number Of CSIR Institutes In Delhi	Sample Size	%age Yield	Round Figure
6	33.33%	1.99	2

Random Values Obtained	Institutes Selected (by Reminder Technique)
365	5
573	3

B) ICMR institutes in Delhi

Total Number Of ICMR Institutes in Delhi	Sample Size	%age Yield	Round Figure
3	33.33%	1	1

Random Values Obtained	Institutes Selected (by Reminder Technique)
728	2

C) ICSSR Institutes in Delhi

Total Number Of ICSSR Institutes in Delhi	Sample Size	%age Yield	Round Figure
5	33.33%	1.66	2

Random Values Obtained	Institutes Selected (by Reminder Technique)
734	4
953	3

D) Universities in Delhi

Total Number Of Universities in Delhi	Sample Size	%age Yield	Round Figure
6	50%	3	3

Random Values Obtained	Institutes Selected (by Reminder Technique)
272	2
550	4
981	3

E) National Level Professional Educational Institutes in Delhi

Total Number Of National Institutes in Delhi	Sample Size	%age Yield	Round Figure
2	50%	1	1

Random Values Obtained	Institutes Selected (by Reminder Technique)
651	1

Strata of Higher Education and Research Institutes in Delhi

Each stratum has been arranged in alphabetical order showing selected Institutes through Stratified Random Sampling

A) CSIR

- 1 Central Road Research Institute, New Delhi
- 2 CSIR HQRS, New Delhi
- 3 Institute of Genomics and Integrative Biology, Delhi **Selected**
- 4 National Institute of Science Communication And Information Resources, New Delhi
- 5 National Institute of Science, Technology And Development Studies, New Delhi **Selected**
- 6 National Physical Laboratory, New Delhi

B) ICMR

1. Institute of Pathology (IOP)
2. National Institute of Malaria Research (NIMR) **Selected**
3. National Institute of Medical Statistics (NIMS)

C) ICSSR

1. Centre for Policy Research
2. Centre for the Study of Developing Societies
3. Centre for Women's Development Studies, Delhi **Selected**
4. Institute for Economic Growth **Selected**
5. Institute for Studies in Industrial Development

D) Universities

1. Guru Gobind Singh Indraprastha University
2. Jamia Hamdard **Selected**
3. Jamia Millia Islamia **Selected**
4. Jawaharlal Nehru University **Selected**

5. National Open University- IGNOU
6. University of Delhi, Delhi

E) National Level Professional Educational Institutes

1. All India Institute of Medical Sciences **Selected**
2. Indian Institute of Technology, Delhi

However, there are few more national level professional educational institutes viz National Institute of Design, National Institute of Fashion Technology and National School of Drama in Delhi which were not included in selection process for not carrying any research programme.

1.5.3.2 Jammu & Kashmir

The higher educational and research institutes in Jammu & Kashmir belongs to strata under CSIR, ICSSR, Universities, National and State Level Professional Educational and research Institutes. The following tables enumerate in detail the number of institution under each stratum and sample size of institutes selected along with the values obtained through stratified random sampling with subsequent result of select institutes.

A) CSIR Institutes in Jammu & Kashmir

Total Number Of CSIR Institutes In J&K	Sample Size	%age Yield	Round Figure
2	50%	1	1

Random Values Obtained	Institutes Selected (by Reminder Technique)
491	1

B) Universities in Jammu & Kashmir

Total Number Of Universities In J&K	Sample Size	%age Yield	Round Figure
7	50%	3.5	3

Random Values Obtained	Institutes Selected (by Reminder Technique)
239	1
884	2
475	6

Besides, there are two premier national and state level professional educational and health institutes in Jammu & Kashmir both of which have been selected for the study i.e. NIT and SKIMS.

Strata of Higher Education & Research Institutes in Jammu & Kashmir

Each stratum has been arranged in alphabetical order showing selected Institutes through Stratified Random Sampling

A) CSIR

1. Indian Institute of Integrative Medicine(IIM), Jammu **Selected**
2. Regional Research Laboratory, Srinagar.

There is no ICSSR and ICMR run institution in Jammu & Kashmir

B) Universities

1. Jammu University **Selected**
2. Kashmir University **Selected**
3. Private - Baba Ghulam Shah Badshah University, Jammu
4. Private - Islamic University of Science & Technology, Kashmir
5. Private- Mata Vaishno Devi University, Jammu
6. Sher-i-kashmir University of Agricultural Science & Technology - Srinagar, Kashmir **Selected**

7. Sher-i-kashmir University of Agricultural Science & Technology -
Jammu

C) National Institute

1. NIT, Srinagar **Selected**

D) Premier State Health Institute

2. SKIMS **Selected**

1.5.4 Sampling

In order to have a thorough understanding of use of web resources in different academic and research institutions of two states under study (viz. Jammu & Kashmir and Delhi) disproportionate stratified random sampling was employed, that allows selection of equal number of respondents from uniform groups. The strata are not sampled according to the population sizes, but higher proportions are selected from some groups and not others. The population was distributed among 15 strata (institutes).

Among the select universities of two states 60 respondents were selected from each university, irrespective of total number of researchers registered. While as, only 20 researchers were selected from each research and premier state & national level educational institutions located in two states. The proportion of researchers chosen in select institutions varies from 11.76% to 80%. The lowest percentage of researchers selected is from JNU forming 11.76% of total 510 enrolled researchers, while the highest percentage of researchers selected is from IEG – Delhi, 80% of 25 registered researchers.

Among universities the highest percentage of researchers selected for the study are from SKUASTK (23.34%) and Jamia Millia Islamia (19.35%), while lowest is from JNU (11.76%) and Kashmir University (12.98%).

In research institutions the highest percentage of researchers selected for the study are from IEG – Delhi (80%) and lowest by AIIMS (17.39%).

The total population of the study is 2670 and out of which 540 are selected for the survey which make the overall sample of 20.22%. Table 1.5.4 gives a picture and comprehensive information about the sampling.

Table 1.5.4: Institution-wise Selection of Researchers

Name of Institution	Total No. of Researchers	No. of Researcher selected	Percentage
Kashmir University	462	60	12.98
Jammu University	396	60	15.15
SKUAST-K	257	60	23.34
NIT, Srinagar	71	20	28.16
SKIMS	31	20	64.51
IIIM Jammu	53	20	37.73
JNU	510	60	11.76
Jamia Hamdard	318	60	18.86
Jamia Millia Islamia	310	60	19.35
AIIMS	115	20	17.39
I G I B-Delhi	30	20	66.66
NISTDS -New Delhi	34	20	58.82
NIMR-Delhi	30	20	66.66
CWDS - Delhi	28	20	71.42
IEG - Delhi	25	20	80.00
Total	2670	540	20.22

Besides, all libraries of select institutes were analysed for their preparedness to face the challenges posed web resources.

1.5.5 Analysis of Data

The data collected is analysed and supported with tables and charts wherever necessary. Wherever required, the data is correlated with the findings of available literature to throw light on meaningful findings and inferences. Besides, Chi square test was conducted on data for cross checking “observed pattern” with “expected pattern” among the research scholars of select institutions. An **alpha level** of $p < 0.05$ was fixed for significance.

1.5.5.1 Chi Square Test (Provide Chi Table)

Chi square test is a **non-parametric** test which can be used as a test of **goodness of fit** and as a test of **independence**. If the calculated value of X^2 is less than the table value at a certain level or if the P-value is greater than 0.05 of significance, the fit is considered to be good which means that divergence between the observed and expected frequencies is attributed to the fluctuation of sampling. But if the calculated value of X^2 is greater than its table value or if the P-value is less 0.05, the fit is not considered to be a good one.

So if the calculated P-value is greater than 0.05 level of significance for a given degrees of freedom (*df*), we conclude that relation exists between the attributes, but if calculated P-value is less than 0.05 level of significance, it means that no relation exists between the attributes.

Minitab

In order to make this manageable a well-known statistical software Minitab was employed for conducting Chi square test.

1.5.6 Testing of Hypotheses

In order to test hypotheses chi square test was applied. The parameters of the test have already been discussed above under heading **chi square test**.

1.6 ORGANISATION OF THE STUDY

The Study is mainly descriptive in nature so as to understand how research scholars use web resources. The study made an endeavour to comprehend awareness, use and degree of satisfaction of scholars with the web resources. In addition, the study also gauged the preparedness of libraries to handle and manage web resources. The data was collected from **heterogeneous** population of research scholars conducting research in diverse fields of knowledge. To construct a convincing line of approach in the thesis, the chapterisation scheme is as follows.

CHAPTER –I INTRODUCTION

Chapter –I contains the statement of the problem, various objectives. It also explains scope and detailed methodology followed in research work.

CHAPTER –II REVIEW OF LITERATURE

It deals with the survey of relevant literature in the related area of research from wide range of primary sources.

CHAPTER –III WEB RESOURCES

The chapter is an endeavour to discuss history and evolution of Web and in-depth genesis of various web resources with exhaustive illustrations.

CHAPTER –IV ANALYSIS OF DATA

In this chapter various aspects of Web like identification of resources, awareness, use and degree of satisfaction with web resources among scholars is analysed in detail. The analysed data is represented with the help of tables. Wherever necessary, data is correlated with the findings of available literature to throw light

on meaningful findings and inferences. Furthermore, chi square test has been employed on data with the help of Minitab statistical package

The impact of web resources on libraries has also been analysed on various parameters like selection, infrastructure, finances and services.

CHAPTER –V FINDINGS AND CONCLUSION

The chapter contains the main findings of the study in a brief and lucid fashion along with the conclusions based on main findings.

APPENDICES

The thesis contains following appendices

Appendix I: Questionnaire for Girl Students

Appendix II: Questionnaire for Parents/Guardians

Appendix III: Schools Selected

Appendix IV: Bibliography

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REVIEW OF LITERATURE

Tim Berners-Lee's invention of the Web has made a huge impact on the way that a vast number of administrative, teaching and research activities are conducted. The online communication via email and discussion lists and access to the internet for scholarly information can be achieved twenty-four hours a day. Web-based resources have become a definite part of educational processes at all levels and a number of studies have been conducted into use of web resources and internet services by teachers, students and scholars all over the world. The present study made a strenuous effort to delve deep and sift through available literature pertaining to the objectives of the study. The reviewed literature divulges that various studies have been conducted to know and understand the use of internet, web resources and degree of satisfaction with the resources available through hypermedia. The following studies are found relevant to present investigation which have used questionnaire tool for collection of data to reveal various inferences.

A Study conducted by **Stoan (1991)** finds that the internet resources are not widely used by academic researchers due to unawareness and illiteracy about the resources and technology. In contrast **Valentines (1993)** reveals that majority of students turn to electronic resources for their research needs as they believe it saves their time and effort to a great extent. The change of perception in a short period of time is due to popularity gained by internet among

academics particularly students. Substantiating above findings **Bucknall and Mangrum (1992)** observes that the major driving force for high use of internet resources by students is that they want to complete their research with minimum time and effort and for many of them the electronic resources are the convenient medium to achieve the goal. Taking this inference further **Seiden, Szymborski and Norelli (n. p)** concludes that students favour electronic resources primarily for their convenience and efficiency and indicates a strong preference for full-text access to information. In a study **Atkinson III and Figueroa (1997)** are also of the same view, while conducting a study on web use, by business students report that majority favour electronic resources over print materials, primarily for their convenience, ease of use, and speed. In fact, many of these students assume that electronic resources would provide answers quickly. **Malone and Videon (1997)** also corroborates that students most frequently cite “ease of use” as their reason for selection of web/electronic resources over print materials. Students are enamoured of subscription-based library databases for their convenience and “ease of use” as compared with the library’s paper indexes and other print materials. Summing up this debate **Sisson and Pontau (1997)** finds that in the three year period from 1994 to 1997, visits to the physical library decreased, while internet accessibility in academic libraries rose from 77% to almost 100%. This increasing tendency toward using electronic resources and information technology has occurred due to the convenience provided by the web resources.

FROM 1998 ONWARDS

Since 1998 growth and development of web has seen geometrical progression both in number of services, information resources and users. Therefore, it would be appropriate to analyse the related literature separately. A study organised by **MacDonald and Dunkelberger (1998)** reveal that students first

turn to Search bank more frequently than any other source. When beginning their research, these students also tend to limit their search in the database to just those articles that are available full-text. The study further deciphers that the development of more comprehensive, relevant, and easily searchable subject directories and search engines (e.g. Yahoo, Google) and the ubiquity of the Web have resulted in a generation of students who now perceive the web as the most familiar, convenient and expedient source of information. Endorsing above findings a study organised in Israel finds that about 50% of social scientists prefer online databases over print sources (**Shoham, 1998**) and 64% of Canadian social scientists who use government statistics prefer to access them electronically (**Nilsen, 1998**). While in a study of incoming students at *St. Olaf College*, majority of students use Web periodical indexes (**Geffert and Christensen 1998**). A study on the internet and web use among 2250 teachers from public and private schools in the U.S. conducted by **Becker (1998)** reveals that 68% of the teachers use Internet to find information resources available on web for preparing their lessons. All these studies clearly indicate heavy reliance of users on web resources and user base for such resources is increasing with day in and day out. **Tolppanen (1999)** substantiates above findings when he deduces that one-half of the English students turn to the web first for information. The study further reports that a 92.5% of students believe that the information they find on the web is accurate and are satisfied with the contents. Concurring the similar inferences **Ren (1999)** reveals that 45% of the undergraduates use the web resources daily and are extremely satisfied with the contents available.

In a separate study **KooganurmathandJange (1999)** reports, that a majority of the users use the internet for communication, followed by the access to various kinds of web resources. More than 70% of the users use web resources like online journals and e-books for higher studies and only 39% use listserves/discussion forums for discussions with peer groups. While **Mahajan and Patil (1999)** states diverse purpose of using web, where research workers

use it for literature search, students use it to know curriculum based information, whereas teachers utilize it to find supporting information to write articles. The study is limited to *Pune University*. In a study, **Zhang (1999)** surveyed 114 U.S. doctoral students at *Texas A & M University* in Commerce, Texas. He comments that the students welcome the adoption and use of the World Wide Web for research and concludes that students perceive the web positively in four of five measured innovation attributes: as providing good relative advantage and high compatibility for research work, and positive trialability and observability. Complexity is the only attribute with a negative correlation. Further **Bavakutty and Salih (1999)** in their findings show that 60% to 85% students, research scholars, and teachers use web resources for the purpose of study, research and teaching respectively. The duo organised the study in *Calicut University*.

Few studies by **Christensen and Bailey (1998)**, **Bao (1998)**, **Seiden, Szymborski and Norelli (n.p)**, **Esposito and Gardner (1999)** reveal that respondents have different opinions on web resources like **Christensen and Bailey (1998)** conclude that although electronic information is becoming increasingly accessible to university students, their experience with this type of access is not necessarily satisfying. They find that university students consider the library easier to use than the Internet and their Internet searches are usually ineffective, difficult and time-consuming. Corroborating with the view **Bao (1998)** find that 15% of faculty and students experience low satisfaction with web resources, of these 44% do not find full-text and 49% do not get the information they need. Sharing the same opinion, **Seiden, Szymborski and Norelli (n.p)**, **Esposito and Gardner (1999)** comment that students do not comprehend this new digital environment. They neither understand the content of the web nor distinguish between a website and a bibliographic database accessed via the Internet.

Diaz et al (2000)organised a study to determine the percentage of patients enrolled in a primary care practice who use the web for health information and to describe the types of information sought. The study observed that 53.5% respondents use the web for medical information and majority of web users are more educated and have higher incomes, thereby relating web use with education and economic background of the users. Furthermore, 60%respondents feel that the information on the web is the "same as" or "better than" information from their doctors,which is a healthy sign and can motivate more and more users to web.Confirming above finds **Taylor, Alman and Manchester(2001)** conducted a study to characterize use of the web by patients and their families referred to general genetics clinics. The study finds that 47% of respondents search the web (for GRI) prior to their clinic visit. The patients and families themselves initiate the majority of such efforts; only 5% respondents are referred to a site by a physician. The study further observes that 46% respondents use the web to get information in layperson's terms, 12% use to get information about treatment and 12% make use to get information about genetic research. The study deduces that web use among patients referred to general genetics clinics and their family members appears to be widespread.While **Borzekowski, DinaandRickert (2001)**conducted somewhat similar study, theyexamined adolescents use and attitude toward accessing health information through the web.The study finds that half (49%) of the respondents use the various web resources to get health information. Adolescents find information to be of high value, reliable, and relevant.

Subsequently, a study at *S V University Tirupathi*, conducted by **Chandran (2000)**to gauge the academic use of web shows that majority of the respondents among teachers, students use the web and e-mail services. The purposes of using World Wide Web include communication and information gathering. The sources used to collect information on internet include websites, journals, magazines and newspapers. At the *Guru Nanak Dev University, Amritsar*,**AmritpalKaur (2000)** conducted a survey regarding the use of

internet facility by faculty and students, substantiates the findings of Chandran reporting that all respondents use internet for sending e-mail and 82% utilize various web resources like e-journals, e-books and ETD's. More than 60% of the respondents use web resources for primary information and 38% for secondary. The results of the study further show that more than 80% of the respondents feel that in comparison to traditional documents, web resources are time saving, easy to use, more informative, more useful and more preferred. In a related study **Zakari (2000)** studied 571 Saudi graduate students in the U.S. where results suggest that Saudi graduate students are motivated to use the web by belief that it offers many academic benefits to their graduate studies like access to online journals, databases, e-books. While as **Allehaibi (2001)** studied web diffusion and the pattern of use among the faculty in Saudi universities. He observes that the majority of the respondents (74.6 %) are using different web resources like library OPAC's, online journals and databases and 25.4 % of the faculty are reluctant to use it. In a similar study conducted on international graduate students at *Florida State University (FSU)* in *Tallahassee* suggests that the students prefer web resources such as the online catalogue, e-journals, and e-books. The top three factors regarding use are 1) availability of the source, 2) quality of the data and 3) ease of use. (**Abdullah, 2000**). **Carlson (2001)** in his study observed that majority of University students is using a variety of web resources in addition to the university library to seek information for their academic needs. He deduces that the web resources may soon become the main information source for most information seekers. Confirming the large scale web use by users particularly students **Chang and Perng (2001)** observe that students make extensive use of the internet in the recent past, mostly Web-based databases, online journals, and search engines. They conducted investigation in *Tatung University* in Taipei (Taiwan). A similar type of study is conducted in the University of *Sharjah (UAE)*, by **BuMa'rafi (2001)** shows that academicians use the web mainly for e-mail, contact with colleagues, accessing library catalogues and online journals. In a comprehensive national survey of 275,811

U.S. college students at 469 universities, 83% of some 41,000 respondents confirm that they use the web resource for research and assignments (**Schau, 2001**). While **Al-Harbi (2002)** conducted a study at *Florida State University* (FSU) concludes that university students prefer web resources for academic needs, due to perceived advantages as immediate gratification in obtaining information, convenience, ease of use, independence, and privacy. In a separate study **Harley (2003)** provides an overview of a two-year study that mapped the universe of digital resources available to undergraduate educators in the Humanities and Social Sciences. The results suggest that faculty use a vast array of online materials from both educational and “non-educational” sources, but many do not use digital resources for a host of reasons including the lack of direct relevance to their preferred pedagogical approaches, and insufficient time and classroom resources. Falling in line with the above deductions **Bar-Ilan, Peritza and Wolman (2003)** observes that the use of web sources is already widespread among the respondents and more than 50% find the web resources indispensable. While as, **de Vicente, Crawford and Clink (2004), Falk (2003)** conducted separate studies and find high usage of web resources (65 - 80%). Some of the reasons attributed to the high usage are the freely available access, the ease of use, and its currency. On the other hand, web resources like online databases are not equally accessed by clients. At the Universities of Zimbabwe and Zululand **Mugwisi, and Ocholla (2003)** examined the use of web by academics and librarians with specific reference to the use of resources for research and teaching. The results indicate that e-mail is used mostly for work and personal use, while telnet and online journals are used predominantly for research purposes. In a similar study, **Kanaujia and Satyanarayana (2003)** reveal that 36.6% users consult e-journals regularly on the web, 40.4% use for consulting technical reports, 24.8% to find online databases and 10.4% for telnet service. Some reasons attributed to low accessibility of online databases includes lack of awareness to web resources, lack of time to access and too many passwords to remember. Studies on usage of other web resources such as library OPACs, e-books and subject gateway

projects reveal differences in use. The study was conducted to gauge level of awareness and demand of web based learning environment among Science & Technology information seekers in Lucknow (India). In Ghana, **Adika (2003)** carried out a study and concludes that web is mainly used for communication (80%), research (44.9%), updating their knowledge (38.5%), and teaching (34.6%). While **Momani (2003)** evaluated the nature, extent and satisfaction with the use of the web by the applied Science and Technology faculty in *Jordan*. He deduces that the web resources are widely used with emphasis on research and communication and is perceived as a very useful resource. The respondents are mostly satisfied with the current status of the web. **Waldman (2003)** confirms the high usage of the web resources like online journals and library's OPAC by students and faculty, while **Falk (2003)** specifically reports the rapid growth and use of e-books in school, colleges and universities. A comprehensive study of web use by the faculty and students at the *University of Ouagadougou*, Burkina Faso, finds that web use is wide spread for research and communication and is primarily influenced by seven factors: *personal satisfaction, information accessibility, enhanced learning, cost effectiveness, technology infrastructure and equipment, financial challenges, and skill challenges (Poda, 2003)*. While, confirming the enhanced learning is a factor in better use of web resources **Dong (2003)** finds that users with higher educational degrees find web resources more useful than less-educated users. He examined the use of web resources and the evaluation of their usefulness from the perspectives of Chinese students and academics at *Peking University, ISTIC*, and at the Information Institute of Science and Technology of Zhe Jiang Province. At *Egerton University* in Kenya, **Nyamboga, Ongonda and Raymond (2004)** organised a study on web use by faculty, students and library staff infer that e-mail, search engines, online journals and e-books are the most used tools and resources. Corroborating the above findings **Ashcroft and Watts (2004)** deduce that the e-books turn out to be one of the most popular web resources, due to easier access, speed of publication, space-saving and lower costs. While users demand integrated access to all web

resources on subject bases to ease of surfing and searching (Cohen and Calsada 2003). At the *Medical University of Isfahan* (MUI), Iran Asemi (2005) carried out a survey on the search habits and use of internet by students. The results show that the researchers of MUI are getting quality information through the internet. Fifty-five per cent of respondents search for scientific information through the internet, because the university library has provided access to various databases and online journals for all students and staff. They use the internet in different ways, such as accessing to online journals, downloading software or text, chatting, discussion, E-mail services and for finding related references. It further discloses that the web is generally used for research. The analysis reveals that 54 percent of users always find useful information on the web. Thirty-one percent of respondents believe that quality information is available on the web. In a related study Birdar and Sampathkumar (2005) finds that 74% use web resources to full extent for research and teaching and 38.6% are using it only to browse e-journals. They carried out a survey in six universities of Karnataka (India) encompassing all the research scholars and faculty members in the department of physics. Bar-Ilan and Fink (2005) also concludes that more than 80% of the respondents frequently use and prefer an electronic format, irrespective of their rank or age. He further comments that most previous studies had concluded an inverse relationship between e-journal usage and age, but now users of all ages switch to the online journals not only in terms of usage but of preference as well. In a separate study Edwin and Markwei (2005) gauged the extent of awareness and use of the web and its resources by academic staff and postgraduate students of the *University of Ghana*. The study concludes that both staff and students are fully aware of the web and most of its services. Academic staff in general uses the web resources more than students. The study established that e-mail is highly used by both staff and students followed by e-journals and databases. Both staff and students find the web a very useful resource. On a similar pattern Al-Ansari (2006) investigated the use of web resources among the faculty members of four colleges of *Kuwait University*. It

observes that a large majority (82%) are using the internet to e-mail, search and webresources mainly for communication, research and publication. In India's biggest open university, *Indira Gandhi National Open University* **Kanungo (2007)** carried out a survey on the use of internet and web resources among IGNOU staff. The study finds that 95% use internet for email and 82.62% use it to collect research based information sources. The study also observes that 58% use web resources for fact finding and 52.17% use it for publication of an article as well. Likewise, **Mohammad Nazim (2008)** conducted a survey in Aligarh Muslim University (AMU) to determine the extent to which internet users are aware and make use of the web resources and services. The study concludes that 70.86% users make use of online journals, 35.31% databases and 29.88% reference documents. The online journals and databases are the preferred information sources among the internet users.

In a slightly different from above studies **Raza and Upadhyay (2006)** examined the usage of specifically "online journals" by the researchers at Aligarh Muslim University. The study concludes that use of online journals is widespread among research scholars not only for research purposes but also to update their own knowledge. Using same pedagogy and user group **Voorbij and Ongering (2006)** carried out a study on the use of online journals among Dutch researchers. It concludes that online journals have become indispensable for scientists and social scientists as 73% use them extensively, and have a profound effect on information behaviour, varying from methods of becoming aware of relevant articles to benefits on research. **Borrego, Anglada, Barrios and Comellas (2007)** conducted a survey on the use of online journals by the academic staff of the universities belonging to the *Consortium of Academic Libraries of Catalonia* (CBUC). The results show that a high proportion of teaching and research staff are aware of the collection of online journals and that there is an increasing preference for them. **Nikam and Promodini (2007)** conclude that majority of academics (i.e. 61.5%) are somewhat aware and 18% moderately aware, while 16% are not aware with the online journals and

databases. The study is carried among faculty members of Science & Technology, *University of Mysore*. **Vibert et al (2007)** in a study explored the bibliographic and documentary information-seeking behaviour of high-level research scientists in the context of ever-developing online bibliographic and documentary information (BDI) resources. The study concludes that French Neuroscientists often use online BDI resources instead of indexes and other print resources for bibliographic and documentary searches.

Hence, the studies reveal high and accelerating use of web resources throughout the globe with varying parameters of awareness, nature of use and views on its impact and effectiveness.

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WEB RESOURCES

3.1 WORLD WIDE WEB

The past two decades have triggered enormous and far-reaching changes in the way information is created, exchanged and used with sophisticated technology -World Wide Web (WWW)(henceforth the Web). It is an enormous and ubiquitous universe of information from umpteen sources accessible in an easy way. The invention of the Web has made, access rather than ownership a key consideration of the information resources. Due to the technology, information, which used to be a property of an individual, a nation or a region, has become a river, now crossing all the borders.

The most exhilarating aspect of the Web has accelerated its growth by providing an easy access and use of graphical interface. Users are attracted to the Web because it is interactive, easy to use, and combines graphics, text, sound and animation into a rich communication medium. The Web gives access to a vast array of documents that are connected to each other by means of hypertext or hypermedia links i.e. electronic connections that link related pieces of information in order to allow a user easy access to them. It is a graphical internet service that provides a network of interactive documents and the software to access them.

The origin for the idea of hypertext can be traced back to historic work of **Bush, Vannevar(1945)** entitled “*As We May Think*”, wherein he proposed “*Memex*” machine as a “device in which an individual stores his books, records and communications and is mechanized so that it may be consulted with enormous speed and flexibility. It is an enlarged intimate supplement to his memory”. This description, which was written about 30 years before the

invention of personal computers and 50 years before the birth of web, lays out the notion of the modern link.

The *Memex* was to be a storage and retrieval device using microfilm storage. The machine would augment human memory by allowing the user to make links, or “associative trials,” between documents. Bush proposed the notion of the blocks of the text joined by links and introduced the term links, linkages, trials and web through his description of a new type of text. Bush believed that using this associative method of information gathering was not only practical in its own right, but was closer to the way the mind ordered information. Bush’s article greatly influenced the creators of what we know as “hypertext” and how we use the internet today (**Massachusetts Institute of Technology, 2002**). The concept of Bush was realised with the Dough Englebart’s “*NLS*” system which used digital computers and provided hypertext e-mail and documentation sharing, which later on was called “*Hypertext*” by Ted Nelson (**Berners-Lee, 1996**). Ted Nelson defined it as a “non-sequential writing”, and only later it became considered a medium limited to computers.

In 1980, taking a lead from Dough Englebart & Ted Nelson’s idea, the Tim Berners-Lee, an independent contractor at the European Organization for Nuclear Research (*CERN*), Switzerland, built *ENQUIRE*, as a personal database of people, software models and a mechanism to play with *hypertext*. Each new page of information in *ENQUIRE* had to be linked to an existing page and this was appreciated by authorities at CERN. (**Berners-Lee and Fischetti, 2000**).

Inspired by the success of *ENQUIRE*, Berners-Lee considered conceiving a system which allow physicists from around the world to share data, with no common machines and no common presentation software. He wrote a proposal in March 1989 for “*a large hypertext database with typed links*”. But it generated little interest. Mike Sendall, the then head of *CERN*, encouraged Berners-Lee to begin implementing his proposed system on a newly acquired *NeXT* workstation. After successful implementation he considered several names to the technology, but settled on “*World Wide Web*” (**Berners-Lee and Fischetti, 2000**). The Web system assigned a common system of

written addresses and hypertext links to all information. Hypertext is the organisation of information units into connections that a user can make and the association is called a link.

The Web gained tremendous appreciation throughout world among professional circles. By 1993 the world started to exploit the Web. In October, 1993 there were around 200 known HTTP servers. The major online services added millions of new users to the Web in 1995, quickly making it a popular technology among people. The year 1995 was the breakout year for the internet, when the connection of the large, online service populations to the Web made it known throughout the world. After a lot of popularity of the Web in university and corporate environments, millions of new home users obtained access to the Web when *CompuServe*, *American Online*, and *Prodigy* provided gateways to the internet. This immigration of a user population that was larger than the entire internet community up to that point had wonderfully positive effects on the vibrancy and growth of the medium, increasing the population, content and pace of technological development (Okin, 2005).

The development and breath-taking services of web has amazed one and all. People from all over the world have described the Web in their own knowledge and understanding. Some of the very stimulating definitions are discussed below.

Crumlish (1998) defines the Web more technically as a huge collection of interconnected hypertext documents. However, Berners-Lee (1996) puts the Web as an interactive world of shared information through which people could communicate with each other and with machines. Taking the string further, Madan and Siddiqi (2002) describe the WWW more lucidly as “The ‘electronic digital diary’ that provides us with a lots of information available on the Internet. Yuhai Tu (2000) defines the WWW as the network of web pages (the nodes) joined together by hyperlinks, whereas the Internet is the physical communication network

linked together by routers. On the same lines ITLESL (2003) have defined the WWW as a collection of linked documents, or pages, stored on millions of computers, and spread over entire internet. While as Willard (2001) calls the WWW as a set of technologies that allow information on the internet to be linked together through the use of links, or connections, in documents. But Castro (2000) puts it as “Gutenberg Press of the time”.

Besides above authorities' number of well-known information sources have defined the Web in their own way. Merriam Webster Dictionary defines **Web (2009, a)** as

“a part of internet designed to allow easy navigation of the network through the use of graphical user interface and hyperlinks between different addresses”

Encyclopaedia Britannica describes the **Web (2010)** as

“information retrieval service of the Internet... that gives users access to a vast array of documents that are connected to each other by means of hypertext or hypermedia links—i.e., hyperlinks which link related pieces of information in order to allow a user easy access to them”.

While as Microsoft published Encyclopaedia Encarta illustrates the **Web (2009, b)** in following words

“Computer-based network of information resources that combines text and multimedia. The information on the World Wide Web can be accessed and searched through the Internet, a global computer network”.

And **Oxford English dictionary(2009, c)** calls it

“Extensive information system on the internet providing facilities for documents to be connected to other documents by hypertext links”.

Thus it can be safely concluded that the Web is a unique service of internet through which information is interwoven by hyperlinks and provides access to range of information sources and services. It has become most popular service of the internet, used interchangeably with each other.

3.2 WEB RESOURCES

Web technologies have changed the whole scenario of information access right from their origin. Before the inception of the Web, access to the information was either through the traditional means of visiting a library or browsing a document or accessing it in an offline manner. But the web publishing made the access to documents easy. The importance of the web resources in day-to-day life continues to grow. An increasing number of institutes associated with education research, business and entertainment all over the world are opting for web resources over traditional formats. With the initiatives like consortia systems, archives, databases etc. the importance of web resources in distance learning, higher education and research programmes are getting more popular. Web resources are becoming more powerful than they were in 1990's and are developing at a very fast rate in the various subjects.

3.2.1 Features

Web resources possess following features.

- a) Web resources are a collection of digital resources with different links.
- b) These are located on thousands and millions of host computers called “Web Servers” across the internet.

- c) These are in a specific format like HTML (Hypertext MarkupLanguage), DHTML (Dynamic Hypertext Markup Language), XML (Extended Markup Language), PDF (Portable Document Format) etc.
- d) Web resources can be retrieved by using various Search tools like Subject Indexes, Search Engines, Subject Gateways, Meta Search Engines, etc.
- e) Web resources are both static and dynamic.
- f) A few checks on Authority or Validity of resources are also available (through subject gateways).
- g) Each resource available via WWW has a unique identification URL (Uniform Resource Locator) which identifies a particular resource.
- h) A single resource can be accessed by an umpteen number of user simultaneously from different locations of the globe.
- i) Web resources are available on 24X7 basis from anywhere.

3.2.2 Factors for the Growth

The well-known factors responsible for the growth of web resources are:

- a) The users and publishers are getting attracted towards web resources for their access and simultaneous escalating cost of print resources.
- b) Information explosion has led both publisher and users to web resources for easy management and dissemination.
- c) Web resources are easier and faster for consultation than accessing print media, like 24x7 availability anywhere.
- d) Multiple files stored on different destinations (servers) can be searched and sifted through a single access point and it has saved much physical space which otherwise can be big hindrance.
- e) Web resources are easy to update besides providing multimedia capabilities to the content.

3.2.3 Types

The Web provides diverse channels of production and expression of information. All these resources are gaining momentum and becoming popular. The well established and popular web resources are:

- Online Journals.
- Online Books.
- ETDs.
- Wikis
- Blogs.
- Databases

An attempt has been made to throw some light on the major web resources enumerated above follows:

3.2.3.1 Online Journals

The journal is fundamental to scholarly communication. The first scholarly journal “*Journal des Scavans*”, was published as a new medium of communication in January 1665, and was soon followed by “*The Philosophical Transactions of Royal Society*”. For more than three centuries, the journals have played a pivotal role in the creation and transformation of knowledge by serving as a primary medium of scholarly communication and have remained essentially unchanged in form and function over their life time.

The dramatic explosion of web has resulted in creating alternative electronic forms of the conventional paper journals. This new form of computer based communication helped in transforming the scholarly communication system and the result of this explosion was electronic journals or online journals.

According to **Tenopir(2003)** the first e-journal appeared during 1970’s. But these were not accessible to a large number of users. With the development of technology, especially the Web, their non-experimental phase started during 1990’s. In 1992 the first peer-reviewed electronic, full text e-journal that

included graphics, “*The Online Journal of Current Clinical Trials*” began publication. This new paradigm made a shift in Scholarly communication. With the increase in the use of the Web and PC’s, the number of online journals rapidly grew. Until 1995, this number was rather low, but then it started to rise, as was observed by Hitchcock et al (**as cited in Mounissamy&Swaroop, 2005**).

The mid 1990s witnessed a great revolutionary trend in the number of online journals. Various educational institutions, libraries and publishers began to provide online journals to their users as they quenched the thirst of the users and also soothed the budgetary expenses of the subscribing institutions thus giving a sigh of relief to them.

A survey conducted by **Zhang and Haslam (2005)** reveal that 35% of the aggregate are the born electronic journals, while 59% of the total journals are print only and remaining 6% are available in print and electronic format simultaneously. With every passing year the impact of electronic journals is awesome in all fields of knowledge and considered as a win-win situation for both publishers and users.

Access rather than ownership has become a key consideration of the resources available on the Web. Journals nowadays are fast transforming themselves from printed to online versions. They are gaining popularity due to ease of access and ease in browsing. The provision of online journals is accelerating. A number of online journals are promised in the years to come that will add to the wealth of web resources. Everyday a number of new online journals are added to web. **Ulrich’s periodical directory(2009)** reflects nearly 45,000 serials available exclusively online.

Scholarly research in the form of online journals is the leader among other resources on the Web. Judged in the wake of phenomenal growth of the Web, online journals are showing a growing influence on the Web among all periodical publications. These, in the scientific world, are an attempt to harness the powers of the computer and networking. The Web in particular and the internet in general have opened new vistas and opportunities to extend the reach of messages via novel and exciting channels and modes of

communication. Online journals have become the mode of choice for academic publication. They have followed such a trend of their publication and presentation that they are bound to gather even more pace in coming years. In the long run, online journals will no doubt become the major form of scientific publication available on web. An online journal is any journal which is available in an electronic or computerized format on the internet. Some more definitions are listed herein:

Smith (2005) comments on online journal as

“Any journal available electronically, includes online version of conventional print journal available for subscription from publishers or aggregators”.

Mounissamy and Swaroop (2005) has given a clear cut definition of online journals as

“Periodical literatures that are made available as individual titles via electronic medium, typically WWW”.

Mahapatra and Chakrabarti (2000) have described of online journals as

“Any serials produced, published, and distributed nationally and internationally via electronic networks such as “Bitnet and the Internet”.

Therefore, from the above definitions it is concluded that online journals are either borne digital or digitized versions of print journals accessed through internet/the Web.

3.2.3.1.1 Features of Online Journals

Some important features of the online journals which make them more popular as compared to their printed counterparts are:

- **Accessibility:** An online version of the journal is accessible at the moment of publishing, hence overcoming time and geographical

barrier.

- **Ubiquitous:** These are accessible anywhere in the world, at any time, by any number of people as long as the connectivity of internet is available.
- **Multimedia:** Online journals have the multimedia capability. They provide text with scrolling text, dancing videos, and touching musical notes thus making them more user loving.
- **Search Facility:** Strong search facility is one of the best provisions of online journals.
- **Hyperlinks:** Links (hyperlinks) provided to references and citations are one of the most important features of online journals.
- **Search Support:** These support different searching capabilities popular known as simple and advanced search which in turn employ different search techniques, thus making retrieval more efficient.
- **Storage:** They save physical storage space. The problem of physical libraries to store more and more collection due information explosion is a big issue, but web resources have solved this issue.
- **Physical Processing:** These do not require physical processing (receiving and binding).

3.2.3.1.2 Major Online Journal Databases

Some of the renowned online journal databases evolved over the years are discussed briefly below.

Project Muse

<http://muse.jhu.edu/>

Project MUSE is an online database of current and back issues of peer-reviewed Humanities and Social Sciences journals. It was founded in 1993 by Todd Kelley and Susan Lewis and is a project of the Johns Hopkins University Press and the Milton S. Eisenhower Library. It had support from

the Mellon Foundation and the National Endowment for the Humanities (Keen, 2007). Currently, MUSE(2009) provides full-text access to current content from over 400 titles representing nearly 100 not-for-profit publishers. To supplement current issues, MUSE subscribers also have free access to over a decade of back-files for selected titles (as on 31st May, 2009). MUSE is a not-for-profit collaboration between the participating publishers and MSEL, with the goal of disseminating quality scholarship via a sustainable model that meets the needs of both libraries and publishers.

JSTOR

<http://www.jstor.org/>

JSTOR(2009) emerged from a project to provide an acceptable archive of older issues of scholarly journals, thereby easing the growing problems faced by libraries of maintaining stack space for their large back-files of printed journals. JSTOR was established as a not-for-profit organisation funded by the Andrew W. Mellon Foundation in the US in 1995 but is now an independent, self-sustaining non-profit organisation. The database contains journal titles across the disciplines, with particular strengths in the Humanities (including literatures, languages, history, philosophy, art history, area and ethnic studies, music and performing arts), Business/Finance, Economics, Sociology, Ecology and Botany, Mathematics, and General Sciences. The complete range includes approximately 924 journal titles and over 221,000 individual journal issues, totalling over 29 million pages of text.

There are now more than 4,300 institutions supporting JSTOR and accessing all or portions of the archive. The user statistics of JSTOR clearly indicates that with the increase in the number of online Journals more and more users are attracted towards it. Usage has grown exponentially over the years. In 1997, the first year the archive was available, there were 1.25 million significant accesses; by 2007, total significant accesses from all participating institutions exceeded 500 million. The publisher sales service, of JSTOR which was launched in December 2006 have over 125 of JSTOR's participating publishers who make the articles from more than 300 journals

available for purchase. Figure 1 brings to light the growth in the total number of accesses between 2003 – 2007 (Spinella, 2008).

EBSCOhost

<http://www.ebscohost.com/>

EBSCOhost (2009) Electronic Journals Service (EJS) is a gateway to thousands of e-journals containing millions of articles from hundreds of different publishers. A total of 1506 publishers contribute to the EBSCO service. (as on 01 June 2009). The number of publishers offering online journals continues to expand rapidly as does the number of online journals. In February 1997, EBSCO'S database of title listings obtained 850 peer reviewed online journals. The number of online journals available through EBSCO has grown exponentially. The database contains more than 3,500 online journals across various disciplines as on June 2009.

Elsevier

<http://www.elsevier.com/>

Elsevier, the world's largest publisher of medical and scientific literature, forms part of the Reed Elsevier group. It publishes about 250,000 articles per year in 2000 journals. Its archives contain 7 million past publications. Besides journals, Elsevier products and services include: VirtualE, ScienceDirect, Scopus, Scirus, EMBASE, Engineering Village, Compendex and Cell.

Springer Science

<http://www.springer-sbm.de/>

Springer Science is a worldwide publishing company focusing on books, e-books and peer-reviewed journals in STM (science, technical and medical publishing). It has more than 33,000 titles available as e-books in 13 subject collections. Within STM, Springer is the largest book publisher, and second-largest journal publisher worldwide after Elsevier, with over 60 publishing houses, 1,900 journals, and 5,500 new books published every year.

Emerald

<http://www.emeraldinsight.com/>

Emerald was formed in 1967 as Management Consultants Bradford (MCB) by a group of academics dissatisfied by the publishing outlets of the time. By 1981 the company was publishing 15 journals and by 1990 it was publishing 65 journals. MCB was renamed Emerald in 2001. Currently Emerald group is publishing 200 online journals and a wide range of serials, series and books in the field of management and Library and information studies.

3.2.3.2 Online Books

The history of online books traces back to 1945, with the idea of Memex, a design envisaged by Vannevar Bush, and continues to present day with the electronic reader such as rocket e-book and electronic book reader applications, such as Acrobat reader and Microsoft reader. The Memex was to be a storage and retrieval device using microfilm storage. The machine would augment human memory by allowing the users to make links, or “associative trails”, between documents. (**Massachusetts Institute of Technology, 2002**). Dream of Bush was nurtured by Michael Hart with the inception of Project Gutenberg. A project dedicated to converting public domain books and documents into ASCII files which over the years inspired number of other such projects in different parts of the world. The next stage in evolution of e-book industry was the creation of CD-ROM that allowed easy access and storage of electronic information. These early efforts led to the current crop of online books, readers and online book applications.

Since the inception of the online books, a number of projects started by various educational institutes like libraries, universities, colleges etc. resulted in the access of online books on the Web via directories, databases, archives, subject gateways, etc. The functional differences in how a book is made available online are profound, with varying levels of ease of reading, copying, repackaging, extracting, storing, and using as an archival copy. Some formats are a threat to current publishing paradigms; others (like page images) are

digital representations of the current paradigm.

Online books are generally presumed to represent the leading edge of innovation in the presentation and dissemination of information. After all, online books use the latest Internet technology to disseminate ideas which for centuries have been available in print. They can reach potentially enormous academic and lay audiences in a fraction of the time and at a fraction of the cost of printed books.

Some confusion persists about what the term Online or e- Book refers to. Any definition of terms would be slightly problematic until technology and practice settle down long enough for language to catch up. To get a better understanding of online books, some of the researchers and authorities who worked in this direction are quoted in proceeding lines.

Thomson (2009) portray online books as

“a complete book that is made available through the Internet. Online books are different to regular e-books because they are available directly on Internet, as opposed to a download”

In view of **Crowston and Williams(2000)**

“An online book is a sequential list of chapters, each linked to the next, ... with a table of contents pointing to each chapter; and a hyper-document has a pattern of densely interlinked pages”.

According to **Das and Mazumdar (2005)** online book is

“a non-serial monographic resources to be accessed by a computer ... remotely”.

From the above definitions one conclude that online books are those books where the text is in digital form of words and images to be accessed through internet and viewed on a desktop/notebook/dedicated portable device or read

on all types of computers. The technology now has made it possible to read whole book to the user thus making online books one of the strong medium for the future publishing industry.

3.2.3.2.1 Features of Online Books

Online books are gaining momentum with widely accepted features. The below mentioned features make them popular among masses:

- a) They are accessible anywhere 24X7.
- b) Now a day's users not only view images, graphics and multimedia, even entire book is narrated to the user.
- c) Purchasing of foreign books is time consuming but in online format it is accessed quickly.
- d) They cost less than the average conventional books one buys from bookstores.
- e) Online books catch the interest of the modern youth and help children to develop a love of reading due to multimedia capabilities.

3.2.3.2.2 Major Online Book Projects

A number of projects have been launched for the books to make them available online on the Web. An exponential growth of online books has made them more favourite among the internet users. Some of the distinguished online book projects are discussed in the following lines.

The Project Gutenberg

<http://www.gutenberg.org>

The Project Gutenberg (2009) the first and largest online library of free electronic books started in 1971 when Michael Hart was a student at the University of Illinois (USA). He set up Project Gutenberg with the goal of

making available for free, and electronically, the largest possible number of books whose copyright had expired. This ground-breaking project became both the first Internet information site and the world's first digitized library. Michael himself typed in the first hundred books. When the Internet became widely-used, in the mid-1990s, the project got a boost and an international dimension. Michael still typed and scanned in books, but now coordinated the work of dozens and then hundreds of volunteers in many countries.

The increase in the online books available through Project Gutenberg is clearly seen as the number of electronic books rose from 1,000 (in August 1997) to 2,000 (in May 1999), 3,000 (in December 2000) and 4,000 (in October 2001). Project Gutenberg had 5,000 books online in April 2002 and reached 10,000 in October 2003, with the support of 1,000 volunteers around the world making 350 new books available every month. As on May, 2009 there are 28,000 free books available in the Project Gutenberg. Users have shown great interest in this project as the number of books downloaded monthly has crossed 2 million mark.

The Million Book Project

<http://www.ulib.org/>

The Million Book Project (2009) (or the Universal Digital Library), led by Carnegie Mellon University School of Computer Science and University Libraries, digitized more than a million books. Working with government and research partners in India and China, the project is scanning books in many languages, using OCR to enable full text searching, and providing free-to-read access to the books on the Web. As on May 2009, they have completed the scanning of 1.5 million books in 20 languages: 970,000 in Chinese; 360,000 in English; 50,000 in Telugu; and 40,000 in Arabic. Most of the books are in the public domain, while permission has been acquired to include over 60,000 copyrighted books (roughly 53,000 in English and 7,000 in Indian languages) accessible online.

Ebrary

<http://www.ebrary.com>

Ebrary(2009) was founded by Christopher Warnock and Kevin Sayar. The vision is to build bridges between islands of information and facilitating the migration of valuable, authoritative information to the Internet through libraries. The core aim of Ebrary is to evolve symbiotic relationship between libraries, publishers, booksellers and consumers. At present, Ebrary offers access to more than 40,000 full-text books and other documents from over 180 of the world's leading academic, trade and professional publishers. Currently more than 1000 libraries throughout the world subscribe to Ebrary.

The Open Content Alliance

<http://www.opencontentalliance.org/>

The Open Content Alliance OCA (2009) was founded in 2005 is a consortium of organizations contributing to a permanent, publicly accessible archive of digitized texts. It is collaborative project of Yahoo!, the Internet Archive, the University of California, the University of Toronto and others. The OCA is, in part, a response to Google Book Search. OCA digitizes copyrighted works only after asking and receiving permission from the copyright holder ("opt-in"). While Google Book Search digitizes copyrighted works unless explicitly told not to do so ("opt-out"). So far OCA has digitised scanning of over 750,000 books, 300,000 of which are now part of the Internet Archive's online collection.

Questia

<http://www.questia.com/>

Questia(2009), the one of largest online library provides access to online collection of books, journal articles, magazines and newspaper articles. It provides access to around 10,000 books from around 300 renowned publishers. One can search each and every word of all of the books and journal articles in the collection. Users can read every title cover to cover. Undergraduate, high school, graduate students, and internet users of all ages

have found Questia to be an invaluable online resource.

Google Book Search

<http://books.google.com/googlebooks/>

Google didn't lack behind in the online book market. It launched its online books programme in 2004 by the name of "Google Print", now known as "Google Book Search" with an attempt to scan the contents of the books available in famous libraries of the world. It quickly grabbed the attention of the user community from all over the world initially five major university libraries of the world namely University of Michigan, Harvard University, Stanford University, the New York Public Library and Oxford University, became part of the programme which is now expanded to 28 library partners. Besides, the book search interface is now available in 35 languages. Over 10,000 publishers and authors from more than 100 countries are participating in the book search partner program. (**Google Book Search, 2009**)

Bookshare

<http://www.bookshare.org/>

Bookshare is an online accessible digital library for print disabled readers. Bookshare has over 50,000 books as on July 2009 in its collection, contributed by volunteers (who scan and upload the books to the site) and by major publishers (who send digital versions of their books to the collection). Bookshare has more than 60,000 users as on July 2009. It is a project run by Benetech, which is a non-profit organisation based in Palo Alto, California, USA.

Internet Archive (IA)

<http://www.archive.org/>

The Internet Archive (IA) is a non-profit organization dedicated to building and maintaining a free and openly accessible online digital library, including an archive of the Web, software, movies, books, and audio recordings. To ensure the stability and endurance of the Internet Archive, its collection is

mirrored at the Bibliotheca Alexandrina in Egypt, so far the only library in the world with a mirror.

The IA makes its collection available at no cost to researchers, historians, scholars, and the general public. It is a member of the American Library Association and is officially recognised by the State of California as a library.

The texts collection includes digitized books from various libraries around the world as well as many special collections. As of September 2009, the Internet Archive operated 18 scanning centres in five countries, digitizing about 1,000 books a day, financially supported by libraries and foundations.

Between about 2006 and 2008 Microsoft Corporation had a special relationship with Internet Archive texts through its Live Search Books project, scanning over 300,000 books which were contributed to the collection, as well as financial support and scanning equipment.

Rare Book Room

<http://www.rarebookroom.org/>

Rare Book Room is an educational website for the repository of digitally scanned rare books made freely available to the public. Starting around 1996 the California based company Octavo began scanning rare and important books from libraries around the world. These scans were done at extremely high resolution using high-quality equipment, with some pages at over 200MB each. These are sold by Octavo as commercial products on CD-ROM. In 2006 the "Rare Book Room" website was created which contains the complete collection in medium to medium-high resolution freely available to the public through a web browser or as a PDF file. As on 2009 over 700 books are reported to be scanned.

The online books are revolutionizing the publishing industry through the rapid proliferation of digital reading material in the market place. Online books are the most important developments in the world of literature since Gutenberg Press. They have become a key driver for the information that used to be a part of the traditional books in print formats having a number of limitations. These help in disseminating the ideas that have been available

only in print. They can reach potentially enormous academic and general audiences in a fraction of the time and at a fraction of the cost compared to that of printed books.

3.2.3.3 Electronic Theses and Dissertations (ETDs)

A university's quality is linked to its library, but now a university's quality is equally linked to its digital library of theses and dissertations, which are easily accessible over the Web. According to Gail McMillan, Director of Virginia Tech's Digital Library and Archives, ETDs are becoming extremely popular and are much more accessible than traditional theses and dissertations(Moxley, 2001).

These have come out the attic and have become an institutional asset and providing faster and better information transfer. These empower students with richer messages through multimedia tools. Further, help to share through effective sharing of information.

The initiative of building ETDs dataset was taken by Virginia Tech, and it is the founding institution for the Networked Digital Library of Theses and Dissertations (NDLTD). The first real activity directed toward ETDs was a meeting convened by Nick Altair of University of Michigan Institute (UMI) in Ann Arbor, Michigan during the fall of 1987 involving participants from Virginia Tech, ArborText, SoftQuad and University of Michigan. In 1992 Virginia Tech joined with the Coalition for Networked Information, the Council of Graduate Schools, and University of Michigan Institute, to invite ten other universities to select three representatives each, from their library, graduate school/program, and computing/information technology groups. This meeting in Washington, D.C. demonstrated the strong interest in and feasibility of ETD activities among US and Canadian universities. In 1993, the South-eastern Universities Research Association (SURA) and South-eastern Library Network (Solinet) decided to include ETD efforts in regional electronic library plans. Virginia Tech hosted another meeting involving multiple universities in Blacksburg, VA in 1994 to develop specific plans regarding ETD projects(Moxley, 2001). On the technical side, the decision

was made that whenever feasible, students should prepare ETDs using appropriate multimedia standards in addition to both a descriptive (e.g., SGML) and rendered (e.g., PDF) form for the main work (**Virginia Tech, 2009**).

In 1996, the pace of ETD activities sped up. South-eastern Universities Research Association (SURA) funded a project led by Virginia Tech to spread the concept around the South-eastern United States. Starting in September 1996, the US Department of Education funded a three-year effort to spread the concept around the USA. The pilot project that had proceeded at Virginia Tech led to a mandatory requirement for all theses and dissertations submitted after 1996 to be submitted (only) in electronic form. International interest spread the concept to Canada, UK, Germany, and other countries. To coordinate all these efforts, the free voluntary federation called NDLTD (Networked Digital Library of Theses and Dissertations) was established and quickly began to expand (**Zhang, Lee and You, 2001**).

3.2.3.3.1 Features of ETDs

The ETD provides a technologically advanced medium for expressing your ideas. It has number of benefit over its print predecessor. Some of them are:

a) Access to Research

ETDs have made it easy for the researchers to know what has been investigated within the institution and over the globe with little geographical limitations.

b) Cost Effective

ETDs are produced at a very low cost especially in case of born digital and take no physical shelf space, besides offer comprehensive cataloguing of content at a very low cost.

c) Better presentation

The ETDs are not restricted to text and tables alone but can

include different multimedia components like audio, video, graphics etc. This provides more dynamic presentation of data easy to comprehend. It also makes it possible to link other related ETDs on the same topic by means of hyperlinks, not possible with print format. These are not restricted to a single format of electronic exchange, but can be changed to different formats with little effort, thus making them vibrant resources for users.

3.2.3.3.2 Major ETD Initiatives

The education and research institutions around the globe are coming up with their own ETD repositories and share this valuable asset. In order to achieve this goal umpteen institutions have already created ETD databases. Some of the very famous and rich ETD network sites and databases are briefly discussed below.

NDLTD

<http://www.ndltd.org>

NDLTD(Networked Digital Library of Theses and Dissertation) is one of the best services to have access to the world's primary information online and including born digital ETD's. The Networked Digital Library of Theses and Dissertations (NDLTD) is an international organization dedicated to promoting the adoption, creation, use, dissemination and preservation of electronic analogues to the traditional paper-based theses and dissertations. NDLTD was established through a research project of Virginia Tech in 1997, with Principal Investigators Dr.Edward A. Fox, (The Father of ETD Movement) Department of Computer Science; Dr.John L. Eaton, Graduate School and Gail McMillan, Digital Library and Archives(Mac Coll, 2002).Digital Libraries of theses and dissertations help to promote the distribution of student research, enhance graduate education, improve information and network technology in universities, and advance digital library technology (Fox, 1999; Kippit *al.*, as cited in Zhang, Lee, & You, 2001). More and more universities are beginning to embrace the idea of

creating and maintaining a repository of electronic theses and dissertations (ETDs). The Networked Digital Library of Theses and Dissertations (NDLTD) coordinate international efforts related to ETDs and have more than 230 members, including universities, consortia and research institutions from the USA and many other countries.

The NDLTD over the last 13 years has worked tirelessly to improve access to research by supporting and encouraging the development of ETD initiatives at institutions around the world.

Australian Digital Thesis Programme (ADT)

<http://adt.caul.edu.au>

Australian Digital Thesis Programme was started all over Australia on 31st July 2000. All Australian universities were invited to join the program. The Program is being coordinated nationally by the Council of Australian University Librarians (CAUL). The aim is to establish a distributed database of digital versions of theses produced by the postgraduate research students at Australian universities. The theses are available worldwide via the Web. The ideal behind the program is to provide access to, and promote Australian research to the international community. The initial project was funded by an Australian Research Council (ARC), Research Infrastructure Equipment and Facilities (RIEF) scheme grant. The ADT concept was an initiative of 7 Australian universities in association with the Council of Australian University Librarians (CAUL). As on August 1, 2009 the total number of digital theses was 11,293 while total number of theses in all formats is 145,131.

Theses Canada

<http://www.collectionscanada.gc.ca/thesescanada/index-e.html>

The Theses Canada programme aims to acquire and preserve a comprehensive collection of Canadian theses at Library and Archives Canada (LAC), to provide access to this valuable research within Canada and throughout the world. At National Library of Canada, the Canadian Theses on

Microfiche Service was actually launched in 1965 at the request of the deans of Canadian graduate schools. The idea was to store theses on magnetic tapes and microfiches. But there was moderate enthusiasm among academic institutions during 1970s and 1980s with the advent of web and it also took pace and presently more than 60 universities of Canada are part of the programme.

As of 2009 there are approximately 300,000 theses and dissertations on microform in Library and Archives Canada's collection. Of these approximately 50,000 are also available electronically.

Murdoch University Digital Theses Programme

<http://www.lib.murdoch.edu.au/adt/>

Murdoch University Digital Theses Programme is a participant in the Australasian Digital Theses Program which is building a distributed database of digital versions of theses produced by Higher Degree by research students at the participating institutions. The theses will be available worldwide via the Web. The aim behind the program is to provide access to, and promote Australian research to the international community.

Murdoch Higher degree by Research students are required to deposit an electronic copy of their thesis with the Library. This copy is converted to PDF format and can then be included in Murdoch's Digital Thesis Database. It is a participant in the Australasian Digital Theses Program.

In addition, there are many other individual universities, consortia, and institutions that have initiated their ETD projects independently. Some of the well-known endeavours are University of Waterloo Electronic Theses and Dissertations Programme and Theses Alive programme of Edinburgh University Library.

Indian Scenario

Vidyanidhi

<http://www.vidyanidhi.org.in>

In India ETD revolution is in its budding stage. The initiative taken by University of Mysore has helped in building a strong platform where researchers and other higher education communities could gain access to the works that were once considered highly confidential and unrestricted. University of Mysore has developed an organizational model and a technical mechanism for creation, submission, archiving and accessing of Indian Theses known by the name of “Vidyanidhi” with a mission of archiving the theses and dissertations. It is a multilingual database and one can access Kannada theses in Kannada and Hindi theses in Hindi. It is working with a mission of expanding its database in other Indian languages also. As on September 05, 2009 Vidyanidhi have 15,000 records in Hindi and 600 records in Kannada.

Vidyanidhi began as a pilot project in the year 2000 with support from NISSAT and DSIR (Government of India) and demonstrated the feasibility of e-Theses programme in India. With support from the Ford Foundation and also from Microsoft India, Vidyanidhi is evolved as a National Initiative. The Ford Foundation support is specifically for focusing on doctoral theses in Social and Human Sciences. The Microsoft support is for the implementation of Unicode for Indian Languages. Vidyanidhi is a member of the Networked Digital Library of Theses and Dissertations (NDLTD), a global initiative for the preparation of ETDs.

The main mission of the programme is to preserve the heritage of India through partnership with various Indian Universities. The research output from Indian Universities will have a global audience and the research work will have a worldwide exposure and recognition. It works with a mission of providing the access to the research findings independent of time and place. Being a prime runner of ETDs in India, Vidyanidhi is working with a mission of giving a boost to the doctoral research. Presently more than 300

universities in India are part of the programme. The portal provide access to 5000 full-text doctoral theses and more than 1,00,000 metadata of Indian theses.

In the next few years it's expected that majority of universities and research institution world over will switch over to ETD's and put them online for the benefit of researchers. This will be a big boon to the research and development globally. It will overcome the time lag and geographical barriers which once were considered big hurdles in research and development. Secondly it will boost and motivate research students to come up with out of box ideas and opinions which they can easily share with research associates world over thus by lifting over-all intellectual competency.

3.2.3.4 Wikis

Wiki has brought fruition to the earliest hopes for the internet. That is, a democratic, accessible community of users responsible for its own content, supported by an open model of knowledge creation and communication. Wikis in particular embodies the highest attainable information sharing dream of an organization where a group of its members is voluntarily and unselfishly collaborating and creating knowledge and working towards a common goal to benefit the organization. This has implications on the management, culture, technology and knowledge base of the organizations and will also inadvertently change the dynamics of organization communication.

It was Ward Cunningham in 1994 who in order to facilitate communication between software developers, and also to experiment with the new hypertext capabilities, created the first wiki, as a supplement to the *Portland Pattern Repository*, a website containing documentation about design patterns, a particular approach to object-oriented programming, which he called "WikiWikiWeb" (using the Hawaiian word "wiki" meaning "quick"). Cunningham went public with the first wiki in early 1995, inviting a selected group of programmers to participate in the experiment. Wiki met with immediate success, and quickly spawned "wiki clones," alternative versions

of the wiki software. The use of wiki websites was rapidly adopted by communities of free software developers, but at first remained confined to these specialised groups (**Ebersbach et al., 2006**). In the meantime the *WikiWikiWeb* evolved rapidly as features were added to the software and as the growing body of users developed a unique "*wiki culture*." By year 2000 the number of contributors to *Cunningham's* website had grown so large that conflicts developed between those who wanted to restrict the discussion to computer programming and those who wanted to discuss issues relating to the functioning of the wiki itself. The conflict was resolved by the creation the "SisterSites" *MeatballWiki* and *WhyClublet* as separate forums for discussion.

Yet, wikis remained largely unknown outside of circles of software developers until around 2001, when the success of the free content encyclopaedia *Wikipedia* introduced wikis to the general public. After 2001 the number of wiki websites and the varieties of wiki engines (software implementations) increased exponentially. There now exist thousands of wiki websites and hundreds of wiki engines. *Wikipedia's* popular success has meant that the concept of the wiki, as a collaborative tool that facilitates the production of a group work, is widely understood.

Thus *Wiki* is a collective website where a large number of participants are allowed to modify any page or create a new page using their Web browser. *Wiki* has introduced ground-breaking innovations at the level of technology for supporting collaborative web-authoring.

Like many simple concepts, "open editing" has some profound and subtle effects on *Wiki* usage. It allows all users to create and edit any page in a website and encourages democratic use of the Web and helps less IT-competent users to contribute content. Wikis are often used to create collaborative websites, to power community websites, and for note taking. A wiki provides an extremely fast and efficient way to collaborate and communicate knowledge among virtually anyone interested without the constraints of place or time. Wikis are, transforming the way corporate world works. Due to advent of wiki there is no longer need for countless conference calls, meetings and emails back-and-forth to resolve issues and understand requirements (**Krause, 2004**). Wikis are one example of what is coming to be

known as “Social Software” a type of software that makes it easy for groups of people to work together in a virtual environment.

Wikis being of recent origin and technology is still in evolving phase, yet various authorities and researchers have defined “Wiki” in their own right. Some of the well-known definitions are given below.

In words of Ward Cunningham, the father of the wiki, it is

“... . a freely-expandable collection of interlinked web “pages”, a hypertext system for storing and modifying information – a database, where each page is easily editable by any user ...” (Leuf and Cunningham, 2001).

While as **Chawner and Lewis(2004)** describe it

“A type of software that makes it easy for groups of people to work in a virtual environment”

According to Encyclopaedia Britannica, **wiki (2009)** is

“A website that allows the easy creation and editing of any number of interlinked Web pages, using a simplified markup language or a WYSIWYG text editor, within the browser”

Therefore, it can be concluded that the wiki is social or organizational web platform where every member or a person can use, contribute and improve the resources.

3.2.3.4.1 Salient features

Various salient features of “Wikis” are

- a) A unique characteristic of “wiki” technology is the ease with which pages can be created and updated.
- b) Most wikis provide the user with a set of navigation or utility tools such as the ability to edit a page; view recently changed pages; use a ‘history’ feature to view or roll back to a previous version of a page; ‘discuss’ offline changes or proposed changes to a page; use a ‘backlinks’ function (view all the pages that link to the page currently

displayed); search the wiki; and others” (Peterson, 2004).

- c) Most wikis provide a “sandbox” where user can test and experiment with the wiki syntax, editing conventions, and other features and functionalities.
- d) Some wiki implementations provide the ability to register users and restrict editing capabilities to a particular set of users (Peterson, 2004).

3.2.3.4.2 Reliability and validity

There is a continuous debate over the authenticity of wiki content. The recent studies by Wilkinson and Huberman (2007); Giles (2005) and Anthony *et al.* (2005) provide evidence that articles contained within Wikipedia are reliable and valid. Research conducted by Stvilia *et al.* (2005) shows that the Wikipedia community takes issues of quality seriously. While as counter argument given by John Seigenthaler, a journalist and a former official in the Kennedy administration, who determined that Wikipedia contained an inaccurate and defamatory biography article about him in 2005 (Ramasastry, 2005; Helm, 2005). Another extensively reported event in 2006 involved senatorial staffers altering factual information about political rivals.

Furthermore, unlike other reference sources, individual *Wikipedia* entries do not list authors' full or even real names, and authors do not post their credentials in terms of expertise in the field of their contributions. Without full disclosure of authorship, readers cannot verify the expertise of the author or even conduct further research on his/her credentials. Although anyone can participate in editing articles, the results are carefully reviewed and discussed in ways very similar to open-source programming projects (McGuinness *et al.*, 2006) that makes its contents reasonably authentic and reliable.

3.2.3.4.3 Major Wikis

Wiki technology is very popular among web users worldwide and seen spurt in the creation and maintenance of wikis in different fields of Knowledge. The study has discussed below few such sources as illustration.

Wikipedia

www.wikipedia.org

Wikipedia (2009) is a web-based, free-content, collaboratively-written encyclopaedia, with editions in nearly 200 different languages. Its content includes traditional encyclopaedia topics and content typically found in almanacs, gazetteers, and other reference works, as well as coverage of current events. As of June 2009, there were more than 200 Wikipedia language editions, with the five largest editions in English containing 2,916,958 articles. Wikipedia was recently recognized as the most visited online encyclopaedia and the second most visited “Education-Reference” web site overall, surpassed only by Dictionary.com.

The Wikipedia is maintained by The Wikimedia Foundation, a non-profit corporation, organized under the laws of Florida, USA that was officially announced on June 20, 2003 by Jimmy Wales. The goals of the foundation are to maintain and develop free-content, wiki-based projects and to provide the full contents of those projects to the public free of charge

Scholarpedia

http://www.scholarpedia.org/

Scholarpedia is an English-language online wiki-based encyclopaedia in which articles are written by invited expert authors and are subject to peer review (**Society of Applied Neuroscience, 2006**). The articles are available online without charge for non-commercial use, but may not be copied in bulk. Authors are given credit on the article page.

Only registered users can edit an article, and those edits are subject to approval by the curator of the article, who is typically the author. Users have a *scholar index* attribute which is incremented or decremented by various activities and which controls what capabilities the user has.

Scholarpedia is not a general encyclopaedia; it currently focuses on the fields of computational neuroscience, dynamical systems, computational intelligence, physics and astrophysics (MIT, 2007). In June 2009, Scholarpedia amounted to 500 peer-reviewed accepted articles and about 1400 articles at diverse stages of completion.

The project was created in February 2006 by Eugene M. Izhikevich, a researcher at the Neurosciences Institute, San Diego, California, who is also the editor-in-chief of the wiki.

Authors of the various articles in Scholarpedia are either invited by the editor-in-chief or other curators, or selected by a public election. This is to ensure that the articles are written by experts. In May 2009, the list of authors included four Fields medallists and sixteen Nobel Prize winners (Nature Physics, 2008).

Wikitravel

<http://wikitravel.org/>

Wikitravel is a web-based project to create a free, complete, up-to-date, and reliable worldwide travel guide. It is launched in July 2003 by Evan Prodromou and Michele Ann Jenkins, the site is based upon the wiki model, using the Creative Commons Attribution ShareAlike license. In 2006, Internet Brands bought the trademark and servers. Wikitravel received a Webby Award for Best Travel Website in 2007. That same year, Wikitravel's founders began Wikitravel Press, which publishes printed travel guides based on the Website's content. The first print guides were released on February 1, 2008.

Wikitravel is built through collaboration of people from around the globe. Articles can cover any level of geographic specificity, from continents to districts of a city. These are logically connected in a hierarchy, by specifying

that the location covered in one article "is in" the larger location described by another. Wikitravel is a multilingual project available in 18 languages, with each language-specific project developed independently

WikiAnswers

WikiAnswers.com

WikiAnswers is a website where knowledge is shared freely in the form of questions and answers. Anyone can ask a question and anyone from anywhere in the world can answer it. This sharing of knowledge in turn becomes part of a permanent information resource. It leverages wiki technology and fundamentals, allowing communal ownership and editing of content. Each question has a "living" answer, which is edited and improved over time by the user community. The wiki uses an Alternates System – where every answer can have dozens of different questions that "trigger" it. When a Contributor asks a question similar to an existing one, the system connects the question to it as an "alternate." This prevents duplicate entries in an effort to promote cohesive answers and a better user experience (**WikiAnswers 2009,a**). It is created in 2002 by Chris Whitten as FAQ Farm, the site and all corresponding domains were acquired by Answers Corporation in November 2006 to become the user-generated content (UGC) component of Answers.com. Following the acquisition, the product was re-named WikiAnswers. As of January 2009, it had over 9,000,000 questions; over 3,000,000 answers; 4,470 categories; over 2 million contributors; and over 500 volunteer Supervisors. According to comScore December 2008 data, WikiAnswers.com had 16.5 million unique visitors in the US and 26.7 million worldwide. (**WikiAnswers 2009,b**)

Knol

<http://knol.google.com/k/>

Knol ("unit of knowledge") is a Google project that aims to include user-written articles on a range of topics. The project was led by Udi Manber, Vice President of Engineering wing of Google. It was announced on December 13,

2007, and was opened to the public on July 23, 2008 with a few hundred articles mostly in the health and medical field.

Google Knol is designed to allow anyone to create a page on any topic, which others can comment on, rate, and contribute to if the primary author allows. So, Knol is open to include articles on 'all topics, from scientific concepts, to medical information, from geographical and historical, to entertainment, from product information, to how-to-fix-it instructions'. Its 'goal is to encourage people who know a particular subject to write an authoritative article about it. Currently contributors to 'knol' are by invitation only

Each knol article is written by a single author, and other users can edit it only with permission from the author. Knol include the opinions and points of view of the authors who put their reputation on the line'. Google does not serve as an editor in any way, and do not bless any content. All editorial responsibilities and control rests with the authors'. On January 16, 2009, Google announced that Knol had grown to 100,000 articles, and users from 197 countries and territories visit Knol on an average day.

Jurispedia

<http://www.jurispedia.org/>

Jurispedia is a wiki encyclopaedia of academic law, currently available in Arabic, Chinese, English, French, German, Spanish and Dutch. It was started in October of 2004, inspired in part by Wikipedia and the Encyclopaedia Libre (University of Seville).

The wiki was developed on the initiative of the Équipe de Recherche Informatique et Droit (Faculty of Law of the University of Montpellier I, France), the Faculty of law of the Can Tho University (Vietnam), the team of JURIS (Université du Québec à Montréal, Canada), the Institut für Rechtsinformatik of Saarland University (Germany), the Southern African Legal Information Institute and the Institut de Recherche et d'Études en Droit de l'Information et de la Communication (IREDIC) of the Paul Cézanne University.

Human Proteinpedia

<http://www.humanproteinpedia.org/>

Human Proteinpedia is a wiki portal for sharing and integration of human proteomic data. It allows research laboratories to contribute and maintain protein annotations. Human Protein Reference Database (HPRD) integrates data that is deposited in Human Proteinpedia along with the existing literature curated information at the context of an individual protein. In essence, researchers can add new data to HPRD by registering to Human Proteinpedia. The data deposited in Human Proteinpedia is freely available for download.

Human Proteinpedia have two significant differences from Wikipedia, first, the contributor is expected to provide experimental evidence for the data annotated; and second, only the original contributor can edit their data. More than 70 labs have participated in this unique effort. Data pertaining to post-translational modifications, protein-protein interactions, tissue expression, expression in cell lines, sub-cellular localization and enzyme substrate relationships can be submitted to Human Proteinpedia - Proteomics portal

SNPedia

<http://www.snpedia.com/>

SNPedia is a wiki-based bioinformatics web site that serves as a database of single nucleotide polymorphisms (SNPs). Each article on a SNP provides a short description, links to scientific articles and personal genomics web sites, as well as microarray information about that SNP. In a June 2008 article on personal genomics, a doctor from the Southern Illinois University School of Medicine said that the availability of online tools such as SNPedia means we are now in the position where the patient often knows more about their risk implications than their doctor. SNPedia is run by two biotech veterans in Bethesda, Maryland, geneticist Greg Lennon and Mike Cariaso. As of 15th September 2009, the wiki claimed to have 7,938 SNPs in their database.

Wikiversity

<http://www.wikiversity.org/>

Wikiversity is a Wikimedia Foundation project, which supports learning communities, their learning materials, and resulting activities. It differs from more structured projects such as Wikipedia in that it instead offers a series of tutorials, or courses, for the fostering of learning, rather than formal content.

It is a centre for the creation and use of free learning materials, and the provision of learning activities. It is one of many wikis used in educational contexts as well as many initiatives that are creating free and open educational resources.

The primary priorities and goals for Wikiversity are to:

- Create and host a range of free-content, multilingual learning materials/resources, for all age groups in all languages.
- Host scholarly/learning projects and communities that support these materials.

Learning is facilitated through collaboration on projects that are detailed, outlined, summarized or results reported by editing Wikiversity pages. Wikiversity learning projects include collections of wiki webpages concerned with the exploration of a particular topic. The participants are encouraged to express their learning goals, and the Wikiversity community collaborates to develop learning activities and projects to accommodate those goals.

Its resources include teaching aids, lesson plans, curricula, links to off-site resources, course notes, example and problem sets, computer simulations, reading lists, and other as devised by participants - but do not include final polished textbooks. Learning groups with interests in each subject area create a web of resources that form the basis of discussions and activities at Wikiversity.

wikiHow

<http://www.wikihow.com/>

wikiHow is a wiki-based community with an extensive database of how-to guides. All of the site's content is licensed under Creative Commons. The site started as an extension of the already existing eHow website, and has evolved to host over 56,000 how-to articles. wikiHow's mission is to build the world's largest and highest quality how-to manual. In March 2009, wikiHow had 16.2 million unique readers.

3.2.3.5 Blogs

Blog had already been around for several years by 1997, when Robert Wisdoms Jorn Borger coined the term “weblog” (**Weired, 2009**). He described a weblog as “a webpage where a weblogger (sometimes called blogger or a pre-surfer) logs all other webpages he finds interesting. And Peter Merholz shortened it to ‘blog’ in May of 1999 when he “broke the word weblog into the phrase “*we blog*” on his site (**Merholz, 1999**). The first website with blog like features was the National Centre for Supercomputing Applications (NCSA) “*What’s New page*”. From 1993 to 1996 NCSA’s website was keeping track of new websites and provided links to new pages on web in reverse chronological order. By 1996 so many new websites had appeared that it was impossible to keep track of them all in one place. A number of notable weblogs sprang up in the late 1990’s, designed to point bloggers’ friends to new websites of interest. At the beginning of 1999, only about 23 weblogs existed. That year, the world of weblogs would be forever changed with the advent of “*Blogger*” the blog software unveiled by Pyra Labs (**American Dialect Society Mailing List, 2008**). Before 1999, anyone who wanted to create a blog had to build it from scratch. It was complicated to develop a simple HTML page for people who knew nothing about the design, networking or software development fields. Its popularity helped spread the term across the Web and to solidify the look and feel of blogs.

To draw a description from its historical use, it can be said that a blog or weblog is a type of website, usually maintained by an individual with regular

entries of commentary, descriptions of events, or other material such as graphics or video. The items of information are constantly updated with new information, personal experiences, analysis, hyperlinks and comments. Entries are commonly displayed in reverse-chronological order.

A typical blog combines text, images, and links to other blogs, Web pages, and other media related to its topic. The ability for readers to leave comments in an interactive format is an important part of many blogs. Most blogs are primarily textual, although some focus on art (artlog), photographs (photoblog), sketches (sketchblog), videos (vlog), music (MP3 blog), audio (podcasting), which are part of a wider network of social media. As of June 2009, blog search engine Technorati was tracking more than 262 million blogs (**Technorati, 2009, a**). With the advent of video blogging, the word blog has taken on an even looser meaning — that of any bit of media wherein the subject expresses his opinion or simply talks about something.

Different interested persons have attempted to define blog and blogging, including practitioners, academics and authoritative information resources.

Rebecca (2005) defines it

“The original Weblogs were link-driven sites containing a mixture in unique proportion of links, commentary, and personal thoughts and essays”.

Salon(1999) describes it

“...personal websites operated by individuals who compile chronological lists of links to stuff that interests them, interspersed with information, editorializing and personal asides”.

According to **Wijnia(2004)** blog is

“A webpage on which authors publish their thoughts with the intention of starting a conversation”

ODLIS defines **blog(2009)** as

“A webpage that provides frequent, continuing publication of weblinks and/ or comments on a specific topic or often in the form of short entries arranged in reverse chronological order, the most recently added information appearing first”

In words of **Scott(2001)** a blog is

“Aweb page containing brief, chronologically arranged items of information”.

OED (2003) defines it as

“A frequently updated web site consisting of personal observations, excerpts from other sources, etc., typically run by a single person, and usually with hyperlinks to other sites; an online journal or diary”

Miriam-Webster(2005) call it

“Aweb site that contains an online personal journal with reflections, comments, and often hyperlinks provided by the writer”

From above definitions it can be inferred that blog is a verybroad concept. People use it for range of purpose like personal diaries, forum to discuss socio, political and economic issues and also acts as an interface between the people and the new web resources published every now and then on the Web.

3.2.3.5.1 Types of Blogs

There are many types of blogs, differing in the type of content and style

❖ Personal blogs

The personal blog is an on-going diary or commentary by an individual, is the traditional and most common blog.

❖ **Corporate blogs**

A blog can be private, as in most cases, or it can be for business purposes. Blogs either used internally to enhance the communication and culture in a corporation or externally for marketing, branding or public relations purposes are called corporate blogs.

❖ **Question blogging**

It is a type of blog that answers questions. Questions can be submitted in the form of a submittal form, or through email or other means such as telephone or VOIP. Qlogs can be used to display show-notes from podcasts or the means of conveying information through the internet. Many question logs use syndication such as RSS as a means of conveying answers to questions.

❖ **By Content**

A blog comprising videos is called a vlog, one comprising links is called a linklog, a site containing a portfolio of sketches is called a sketchblog or one comprising photos is called a photoblog. Blogs with shorter posts and mixed media types are called tumblelogs.

3.2.3.5.2 Prominent Blogs

Blogs are popular publishing tool used by people across the globe for varied reasons. Today millions and millions of blogs are available on the Web. Blogs put forth view point regarding socio, political, economic or scientific aspects of the world. The following lines provide an illustration of some prominent blogs.

Aetiology

(<http://scienceblogs.com/aetiology/>)

Aetiology is a blog started in 2005 and written by Tara C. Smith, a faculty member with an expertise in epidemiology working in the College of Public Health at the University of Iowa. Its stated goal is to discuss "causes, origins, evolution and implications of disease and other phenomena." (**Aetiology, 2009**)

It is hosted by the Seed magazine's "Scienceblogs" organization. Aetiology was chosen to be one of the inaugural blogs for Scienceblogs, which is selective about which blogs it features and also pays all costs and provides technical support. This venture by Seed Magazine demonstrates that science blogs are being recognized as gaining traction in the standard scientific literature. Science blogs have been mentioned as sources in both Science magazine and Nature magazine. (**Netwatch, 2005**)

Professor John Gay, a veterinarian from Washington State University, lists *Aetiology* as one of his suggested sources of information on avian influenza for students and other veterinarians. Posts from Aetiology were selected by Bora Zikovic for his book on the 50 best science blog postings of 2006 (**Gay, 2007**).

In 2006 Aetiology was nominated for a "Koufax Award" for "*Best New Blog*" and same year it featured in the Canadian student-produced science magazine *Hypothesis*, (**Amsen, 2006**) *Cell*, (**Bonetta, 2007**) *MedScape Today*, (**Genes, 2007**). *The Epidemiology Monitor Newsletter*, and even the New England Skeptical Society's "*The Skeptics Guide*" (**The Skeptics Guide, 2006**). Aetiology was described in WebMD's *Medscape Today* in 2006 as, "*a star attraction on Seed Magazine's ScienceBlogs*." (**Genes, 2006**).

GigaOM

<http://gigaom.com/>

GigaOM is a Web 2.0 blog started by Om Malik and published by Giga Omni Media, Inc. in San Francisco. The website has a monthly global audience of 500,000, (**GigaOM, 2009**) is among the top 50 blogs worldwide by

Technorati Rank (**Technorati, 2009,b**) and is part of CNet's 100 Most Influential Blogs (**CNET, 2009**).

It offers Web 2.0 news, analysis and opinions on start-ups, new technologies, broadband and online games. According to GigaOM, the site's readership includes a worldwide following of technology industry leaders, venture capitalists, and entrepreneurs. GigaOM is ranked in the top 100 IT news sites by internet tracking service, Hitwise. GigaOM integrates a number of other blogs and services into its network.

Gizmodo

<http://www.gizmodo.com/>

Gizmodo is a popular technology weblog (**Alexa, 2009**) about consumer electronics. It is part of the Gawker Media network run by Nick Denton. The blog, launched in 2002, was originally edited by Peter Rojas. Due to tremendous success of blog VNU and Gawker Media in 2005 formed an alliance to republish Gizmodo across Europe, with VNU translating the content into French, German, Dutch, Spanish, Italian and Portuguese, and adding local European-interest material (**MarketingVOX, 2005**). The blog very popular among tech savvy people around the world and is being rated as one of the best in the business.

Pharyngula

<http://scienceblogs.com/pharyngula>

Pharyngula is a science blogs run by PZ Myers. In 2006 the science journal *Nature* listed it as the top-ranked blog written by a scientist. It has also won the 2005 *Koufax Award* for Best Expert Blog. The blog topics are eclectic, delving into the non-scientific as well as scientific. It has become particularly well-known for Myers' writing style (characterized by sarcasm) and criticism of intelligent design and creationism.

It was started on 19 June 2002. Myers often criticizes intelligent design, creationist and other pseudoscientific websites. He also often posts on

subjects such as science, religion, politics, superstition, and education. His experience in evolutionary developmental Biology and as a teacher provides depth to the subjects of science and education. One theme that arises regularly is that of cephalopods, creatures that Myers finds quite fascinating.

Mashable

<http://mashable.com/>

Mashable is an Internet news blog. With a reported more than 7million monthly page views and an Alexa ranking of 750 (**Alexa, 2009**) it ranks as one of the largest blogs on the Internet. It regularly writes about YouTube, Facebook, Google, Twitter, MySpace, Apple and startups, but it also reports on less high-profile social networking and social media sites. (**BusinessWeek, 2007**). Mashable is popular on many social networks. As of August 26, 2009, it has over 1,270,000 Twitter followers, 38,000 fans on Facebook, and over 300,000 RSS subscribers.

The Huffington Post

www.huffingtonpost.com

The Huffington Post (often referred to as **HuffPost** or **HuffPo**) is an American liberal news website and aggregated blog founded by Arianna Huffington, Kenneth Lerer and Jonah Peretti, featuring various news sources and columnists (**Kurtz, 2007**).The site offers coverage of politics, media, business, entertainment, living, style, the green movement, world news, and comedy, and is a top destination for news, blogs and original content. In four years, it has become an influential media brand - "The Internet Newspaper." *The Huffington Post* was launched on May 9, 2005, as a commentary outlet and liberal alternative to conservative news aggregators.

The Huffington Post has an active community, with over one million comments made on the site each month. In addition to columns by core group of contributors The Huffington Post has over 3,000 bloggers -- from politicians and celebrities to academics and policy experts -- who contribute

in real-time on a wide-range of topics. Among those who have blogged on the site are famous personalities like US president Barack Obama, Hillary Clinton, John Kerry, Nancy Pelosi,

Due to its undiluted quality of news and views it blogs has won many laurels as it was named among the 25 Best Blogs of 2009 by *Time Magazine* (**TIME, 2009**), while *Guardian* (**2008; Sept. 03**) considered it the most powerful blog. It also won consecutively the 2006 and 2007 Webby Awards for Best Politics Blog.

Language Log

<http://languagelog ldc.upenn.edu/nll/>

Language Log is a collaborative language blog maintained by University of Pennsylvania phonetician Mark Liberman. The site is updated daily by the contributors, and most of the posts are on language use in the media and popular culture. Other popular topics are the descriptivism/prescriptivism debate and linguistics-related news items. The site has also occasionally held contests in which visitors attempt to identify an obscure language.

Language Log is now one of the most popular linguistics blogs in the blogosphere. As of August 2009, it receives an average of about 14,500 visits per day. The blog has been conferred with famous *Becky Award* usually bestowed to outstanding linguists of the world.

Zoologix

<http://scienceblogs.com/Zoologix>

Zoologix is a zoology blog created and edited by Andrew and Benny Bleiman. The blog focuses on bizarre zoological news, covering research published in scientific journals, such as the Public Library of Science (PLoS), as well as stories reported in general news outlets. Typical items include the discovery of new species, newly documented animal behaviour, zoo and aquarium industry news, and interviews with scientists and researchers. Content is written to be accessible to a non-scientific audience.

The site has been featured on ABC News, in Seed Magazine, Mental Floss, and the Annals of Improbable Research, awarders of the “Ig Noble Prize”. The site attracts a diverse readership from notable scientists, such as PZ Myers, to biology students to young children.

Cosmic Variance

<http://cosmicvariance.com/>

Cosmic Variance is a collaborative blog discussing physics, astrophysics, and other topics, written by JoAnne Hewett et al. It is the successor to Carroll's earlier blog Preposterous Universe, which began in early 2004 and ran through much of 2005. The blog's name comes from the cosmology concept of cosmic variance.

Cosmic Variance has rapidly become "undoubtedly the most popular blog written by physicists." In 2006, Nature reported that it was the fourth most popular science blog and one of only five blogs by scientists in the 3500 most popular blogs. As on July 26, 2007, Cosmic Variance had a Technorati authority of 1001 and rank of 2277. In 2008, the blog became part of the Discover magazine website.

3.2.3.6 DATABASES

The origin of online databases is of very recent one. The first electronic database started in 1960s. The US Library of Medicine provided the first offline on demand batch searching of their MEDLARS system to medical professionals in 1964. After that Lockheed Missiles Corporation (Dialog), System Development Corporation (SDC) and Chemical Abstract Service (CAS) developed their versions of database service. In 1968, MEDLINE was the first to online database dial up service. Right after that in 1972, Dialog and ORBIT (SDC) started commercial online databases. (Walker and Janes, 1999)

A study conducted by William (2006) has monitored the growth of online industry for about 30 years, from 1975 to 2005. According to his findings online databases increased considerably, from 301 in 1975 to 17539 in 2005

showing an exponential growth which is more due to invention of web. Online databases are now considered a significant and handy source of information in every field of knowledge and business.

From 1990s organizations demand for directory databases services has become an extreme necessity not only for academics and research but for business and other areas as well. Businesses are able to use directory services that provide prompt searches for their company and product information and online sale and resale. Web searches have also been possible only because of databases maintained by search engines. Retailers have also benefited from the developments with data warehousing (Seltzer, 2008). In this landscape an online databases have taken the forefront and is being developed like a wildfire to satisfy ever-growing demand.

Online databases have been defined by different authoritative sources and some of them are quoted below;

Cambridge Dictionary defines **online database(2009,a)** is

“A large amount of information stored in a online computer server in such a way that it can be easily retrieved and accessed by means of different access points from a network”.

Encyclopaedia Britannica describes **online database(2009,b)**as

“Any collection of data, or information that is specially organized for rapid search and retrieval by a computer. Databases are structured to facilitate the storage, retrieval, modification, and deletion of data in conjunction with various data-processing operations”.

Thus an online database is the system and mechanism of storing data in a way that can be easily retrieved with the help of different access points and also data can be manipulated or modified with little effort.

3.2.3.6.1 Types of Online Databases

Three types of online databases are:

- a) Bibliographic databases
- b) Full-text Databases
- c) Numeric Database

a) Bibliographic Database

A bibliographic database is a catalogue of bibliographic records. It may be a database containing information about books and other materials held in a library (e.g. an online library catalogue, or OPAC) or, as the term is more often used, an electronic index to journal or magazine articles, containing citations, abstracts and often either the full text of articles indexed, or links to the full text.

b) Full-text Database

A full-text database is a compilation of documents or other information in the form of a database in which the complete text of each referenced document is available for online viewing, printing, or downloading. In addition to text documents, images are often included, such as graphs, maps, photos, and diagrams. A full-text database is searchable by keyword, phrase, or both.

Full-text databases are used by college and university libraries as a convenience to their students and staff. Full-text databases are ideally suited to online courses of study, where the student remains at home and obtains course materials by downloading them from the Internet. Access to these databases is normally restricted to registered personnel or to people who pay a specified fee per viewed item.

c) Numeric database

Numeric databases provide mostly numeric data such as statistics, financial data, census information, economic indicators.

3.2.3.6.2 Major Online Databases

Some of the renowned databases are briefly discussed below.

LexisNexis

<http://www.lexisnexis.com/>

LexisNexis (often called "Lexis" or "Nexis" by customers), a division of Reed Elsevier, offers a widely used, searchable, and identically named archive of content from newspapers, magazines, legal documents and other printed sources. LexisNexis is one of the "world's largest collection of public records, unpublished opinions, forms, legal, news, and business information", and targets its products to a wide range of professionals in the legal, risk management, corporate, government, law enforcement, accounting and academic markets.

The Lexis database contains all current United States statutes and laws and nearly all published case opinions from the 1770s to the present, as well as all publicly-available unpublished case opinions from 1980 onward. Since 2000, Lexis has begun building a library of briefs and motions as well.

It also has libraries of statutes, case judgments and opinions for many other jurisdictions such as France, Australia, Canada, Hong Kong, and the United Kingdom. Lexis has databases of law review and legal journal articles for all the countries for which it has materials.

It makes available content from 20,000+ global news sources, company & industry intelligence providers, biographical and reference sources, intellectual property records, public records, legislative and regulatory filings and legal materials. Nexis offers a global, multi-lingual content collection with an archive dating to the 1970s for some sources. Content offerings may be customized to reflect user needs and preferences.

Education Resources Information Center (ERIC)

<http://www.eric.ed.gov/>

The Education Resources Information Center popularly known as ERIC, sponsored by the Institute of Education Sciences (IES) of the U.S.

Department of Education, produces a large international database of journal and non-journal education literature. The ERIC online system provides the public with a centralized ERIC website for searching the ERIC bibliographic database as well as for submitting materials so that it can be considered for inclusion in the database. ERIC provides access to bibliographic records of journal and non-journal literature indexed from 1966 to the present. ERIC also contains a growing collection of full-text materials in Adobe PDF format including the legacy ERIC Digests.

The ERIC collection includes bibliographic records (citations, abstracts, and other pertinent data) for more than 1.2 million items indexed since 1966. It includes journal articles, books, research syntheses, conference papers, technical reports, policy papers, and other education-related materials.

Prior to January 2004, the ERIC network consisted of sixteen subject-specific clearinghouses and a number of support components. Each of the sixteen clearinghouses recommended materials for inclusion in the ERIC database, but also maintained additional extensive resources available by contacting the clearinghouse.

POPLINE

<http://db.jhuccp.org/ics-wpd/popweb/>

POPLINE (or Population Information Online) is a reproductive health database, containing citations with abstracts to scientific articles, reports, books, and unpublished reports in the field of population, family planning, and reproductive health issues. POPLINE is maintained by the INFO Project at the Johns Hopkins Bloomberg School of Public Health Centre for Communication Program and it is funded by the United States Agency for International Development (USAID). POPLINE is also part of the One Source database, a combination of resources from six databases produced by the INFO Project.

It provides more than 370 thousand records citing worldwide literature in the area of reproductive health. The majority of items are published from 1970 to the present, but there are selected citations dating back to 1827. The database adds 12 thousand records annually and is updated weekly.

Subjects covered internationally include family planning methods and programs, fertility, and population law and policy. Additional subjects covered in reference to developing countries include adolescent reproductive health, demography, environmental health, gender and health, health communication, sexually transmitted infections, maternal and child health, population and environment, and women in development.

Web of Science

<http://scientific.thomson.com/products/wos/>

Web of Science is an online academic service provided by Thomson Reuters. It provides access to seven databases: Science Citation Index (SCI), Social Sciences Citation Index (SSCI), Arts & Humanities Citation Index (A&HCI), Index Chemicus, Current Chemical Reactions, Conference Proceedings Citation Index: Science and Conference Proceedings Citation Index: Social Science and Humanities. Its databases cover almost 10,000 leading journals of science, technology, social sciences, arts, and humanities and over 100,000 book-based and journal conference proceedings.

The citation indices listed above contain references which have been cited by other articles. One may use such citations to undertake cited reference searching, that is, locating articles which cite an earlier publication. One may also search the three citation databases by topic, by author, by source title, and by address. The two chemistry databases allow for the creation of structure drawings, thus enabling users to locate chemical compounds and reactions.

INSPEC

<http://inspecdirect.theiet.org/>

“INSPEC” is a major indexing database of scientific and technical literature, published by the Institution of Engineering and Technology (IET), and formerly by the Institution of Electrical Engineers (IEE), one of the IET's forerunners.

Its coverage is extensive in the fields of physics and computer, control, and Mechanical engineering. Its coverage in Applied Mathematics includes many practically oriented mathematical articles that are excluded from MathSciNet and Zentralblatt MATH, which limit themselves to Mathematics and some of Computer Science.

INSPEC started in 1967 as an outgrowth of the Science Abstracts service. The electronic records were distributed on magnetic tape. In the 1980s, it was available in the U.S. through the Knowledge Index, a low-priced dial-up version of the Dialog service for individual users, which made it popular. The Web version of database is known as InspecDirect.

Scopus

<http://www.scopus.com/>

Scopus is a database of abstracts and citations for scholarly journal articles. It nearly covers 18,000 titles from more than 5,000 international publishers, including coverage of 16,500 peer-reviewed journals in the scientific, technical, Medical and Social Sciences (including Arts and Humanities). It is owned by Elsevier and is provided on the Web for subscribers. Scopus also offers author profiles which cover affiliations, number of publications and their bibliographic data, references and details on the number of citations each published document has received. It has alerting features that allow anyone who registers to track changes to a profile. By using *Scopus Author Preview* anyone is able to search for an author, with affiliation name as a limiter, verify the author's identification and set-up an automatic RSS feed or e-mail alerts to the author's homepage.

MEDLINE

<http://www.nlm.nih.gov/pubs/>

MEDLINE (Medical Literature Analysis and Retrieval System Online) is a bibliographic database of life sciences and biomedical information. It includes bibliographic information on articles from academic journals covering medicine, nursing, pharmacy, dentistry, veterinary medicine, and health care. It also covers much of the literature in biology and biochemistry, as well as fields such as molecular evolution. The database is compiled by the United States National Library of Medicine (NLM).

The database contains more than 18 million records from approximately 5,000 selected publications covering above mentioned fields from 1950 to the present. Originally the database covered articles starting from 1965, but this has been enhanced, and records as far back as 1950/51 are now available within the main index. The database is freely accessible on the Internet via the PubMed interface.

With these variety and types of web resources available the future looks all for the Web enabled information resources for every sort of information and knowledge. With every passing year the organisation of these resources is expected to be more systematic and meaningful for all the stakeholders. It will help users to make maximum use of them in their pursuit of knowledge and scholarship.

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ANALYSIS AND DISCUSSION

The purpose of the study is to examine the use of web resources by research scholars of select academic and research institutes of Jammu & Kashmir and Delhi. The main focus of the research is to gauge the awareness, identification, use and degree of satisfaction of webresources among research scholars. Fifteen (15) institutions are selected for the study, out of them three from CSIR family (IGIB, IIIM and NISTDS), two of ICSSR (CWDS and IEG), and one of ICMR (NIMR). The other institutions included are six universities, one premier State, two national level institutes.

The data is analysed under following major sections supported with tables and charts wherever necessary.

The sections are:

1. General Description
2. Identification of Web Resources
3. Web Resources Awareness
4. Web Resources-Use
5. Degree of Satisfaction with Web Resources.

The study also made an endeavour to identify the impact and preparedness of libraries of above select institutions to face the challenges posed by the emergence of web resources. As such data has been further analysed and discussed under:

6. Impact on Libraries

4.1 GENERAL DESCRIPTION

4.1.1 Internet Access Location

The study identified different internet access locations and found “Institution/University” most popular place among the scholars (40% to 95%). The scholars of Kashmir University prefer their parent institute (95%) as against CWDS - Delhi (40%). The overall preference is 75%. Chi square (X^2) value = 50.489 and P-Value = 0.000 show a significant variation among research scholars of various institutions using the “Institution/University” location for accessing internet. A study by **Rajeev Kumar and Amritpal Kaur (2005)** found majority of the respondents (70.1%) access the internet at their institution, substantiating the findings of the present study. However, **Madhusudhan (2007)** concludes that only 27% users prefer institution as access point.

The second most popular location of access is “home”, as 8.33% to 65% scholars prefer it in Jamia Millia Islamia and SKIMS respectively with overall average of 28.51%. A significant variation among research scholars of various institutions is evident from $X^2 = 55.668$ and P-Value = 0.000 about “home” as a location for accessing internet. In a study by **Perry, Perry and Curlin (1998)** found that 42% of users browse the web at home which is quite higher than the present findings.

The “Cybercafé” is identified as the next preferred location (5% - 35%). The scholars (5%) from NIMR-Delhi least prefer it while scholars of SKIMS (35%) opt for it in majority. $X^2 = 29.846$ and P-Value = 0.008 point out considerable variation between research scholars of various institutions about using “cybercafés” for accessing internet. A similar study by **Mohammad Nazim (2008)** revealed that 7% of respondents prefer internet access via “cybercafés”. In another study by **Rajeev Kumar and Amritpal Kaur (2005)** found 13.5% respondents access internet at “cybercafés”. The higher use of

“cybercafés” by scholars in the present study could be due to availability of limited access points in the institution or periodicity based access which restricts researchers in accessing the internet in the institutions as such relying on cybercafés considerably. Table 4.1.1 offers clear picture and comprehensive information.

Table 4.1.1:Location of Internet Access

Type of Location	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Home	23 (38.33)	28 (46.66)	18 (30.00)	7 (35.00)	13 (65.00)	7 (35.00)	12 (20.00)	7 (11.66)	5 (8.33)	2 (10.00)	7 (35.00)	9 (45.00)	5 (25.00)	5 (25.00)	6 (30.00)	154 (28.51)
University/ Institution	57 (95.00)	53 (88.33)	43 (71.66)	12 (60.00)	15 (75.00)	15 (75.00)	49 (81.66)	42 (70.00)	47 (78.33)	15 (75.00)	16 (80.00)	12 (60.00)	11 (55.00)	8 (40.00)	10 (50.00)	405 (75.00)
Cybercafe	10 (16.66)	16 (26.66)	12 (20.00)	5 (25.00)	7 (35.00)	5 (25.00)	14 (23.33)	11 (18.33)	14 (23.33)	1 (5.00)	---	2 (10.00)	1 (5.00)	2 (10.00)	---	100 (18.51)

Figures in parenthesis indicate percentage

4.1.2 Internet Services

The “World wide web” (www) and e-mail are the most popular services among research scholars. All the respondents (100%) utilize these services, irrespective of the institution they belong. The findings are substantiated by **Rajeev Kumar and Amritpal Kaur (2005)** with negligible difference as 99.3% use web and e-mail according to their study. Hence results faintly vary with present study.

“Listserv” is availed by a good segment of researchers (21.66% - 90%) of select institutions of two states. The service is most popular among researchers of AIIMS (90%), while it is least used by the scholars (21.66%) of Jammu University. The use of “Listserv” among the researchers of different institutions reveals a significant variation through $X^2=78.305$ and **P-Value = 0.000**. A study by **Oliver(1998)** on “Use of Internet resources by German medical professionals” finds that 65.6% professionals use “Listserv” which is quite higher than the present study. The difference in use could be attributed to variety of reason like current study doesn't contain homogenous population, while in case of Oliver, study refers to homogenous population. Secondly, scholars in our study may have lesser awareness level of the service as compared to German counterparts.

A fewer scholars (31.11%) use “FTP” (file transfer protocol). The maximum number of researchers (75%) of AIIMS and I G I B-Delhi use this service and least by scholars (10%) of IIM – Jammu, Jamia Millia Islamia, NISTDS - New Delhi and NIMR-Delhi. While as, the scholars from SKIMS and SKUAST-K of Jammu & Kashmir do not use this service. $X^2=132.356$ and **P-Value = 0.000** indicate a significant variation among research scholars of various institutions using internet service “FTP”. A similar study by **Oliver(1998)** reveals whopping (78.9%) respondents use “FTP”. While in a study by **Rajeev Kumar and Amritpal Kaur (2005)** among engineering college students of Punjab India reveals 35% use this service.

“Chatting” is less popular and a limited number of researchers (16.48%) use this service. The optimum use is made by the scholars of CWDS – Delhi

(45%), while researcher scholars at IIM – Jammu, I G I B-Delhi and NIMR-Delhi do not make use of the service. The use of “Chatting” among research scholars of different institutions varies significantly as indicated from $X^2=73.236$ and **P-Value = 0.000**. The two studies by **Rajeev Kumar and Amritpal Kaur (2005)** and **Oliver(1998)** found contrasting use of “Chatting” service with 73.6% and 8.9% responses respectively. This could be attributed to the fact that two populations were studied by the investigators belonging to different parts of the world. Considering results of two studies, the population of present study is again not homogenous. Therefore, variation in use of the service is clear. The varying use of different services of internet could be due to lack of awareness, inadequate learning opportunities and information seeking behaviour. Table 4.1.2 provides comprehensive details.

Table 4.1.2: Use of various Internet Services

Internet Services	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
E-mail	60 (100)	60 (100)	54 (90.00)	20 (100)	20 (100)	20 (100.00)	60 (100)	60 (100)	60 (100)	20 (100)	20 (100)	20 (100)	20 (100)	20 (100)	20 (100)	540 (100%)
WWW	60 (100)	60 (100)	60 (100)	20 (100)	20 (100)	20 (100)	60 (100)	60 (100)	60 (100)	20 (100)	20 (100)	20 (100)	20 (100)	20 (100)	20 (100)	540 (100%)
FTP	30 (50)	25 (41.66)	---	12 (60.00)	---	2 (10.00)	26 (43.33)	27 (45.00)	6 (10.00)	15 (75.00)	15 (75.00)	2 (10.00)	2 (10.00)	3 (15.00)	3 (15.00)	168 (31.11)
Listserv	21 (35)	13 (21.66)	27 (45.00)	5 (25.00)	7 (35.00)	15 (75.00)	33 (55.00)	42 (70.00)	28 (46.66)	18 (90.00)	14 (70.00)	14 (70.00)	15 (15.00)	5 (25.00)	7 (35.00)	264 (48.88)
Chatting	2 (3.33)	14 (23.33)	1 (1.66)	5 (25.00)	1 (5.00)	---	12 (20)	10 (16.66)	25 (41.66)	2 (10.00)	---	3 (15.00)	---	9 (45.00)	5 (25.00)	89 (16.48)

Figures in parenthesis indicate percentage

4.1.3 Use of e-mail

The researchers use e-mail for different purposes. It is revealed that scholars use it mainly for research work (65%-85%). Majority of scholars of SKIMS (85%) use it for “Research”, whereas least number of researchers (65%) at NIT – Srinagar and SKUAST-K avail it for the same purpose. No significant variation among scholars of various institutions about using e-mail for “Research” is found, which is obvious from $X^2=8.733$ and **P-Value = 0.848**. A study by **Rajeev Kumar and Amritpal Kaur (2005)** ascertained that 76.1% use this for academic purpose, substantiating the findings of the current study.

A sizeable number of scholars (52.03%) take advantage of this instant service for “personal matters”. The most of such scholars (65%) belongs to IEG - Delhi and the minimum to IIM – Jammu (25%). No significant variation among research scholars of various institutions is divulged from $X^2=17.695$ and **P-Value = 0.221** about using e-mail for “Personal matters”. The figures here are lower compared to findings revealed by **Rajeev Kumar and Amritpal Kaur (2005)**, where user base of 77.5% exploit e-mail for “Personal matters”.

A small percentage of researchers (35.92%) from universities and research institutions use it for “Entertainment”. The majority of such researchers are from NIT-Srinagar (55%) and minimal number of scholars (25%) belongs to NIMR-Delhi. $X^2=21.303$ and **P-Value = 0.094** support the view as no significant variation among research scholars of various institutions about using e-mail for “Entertainment”. **Rajeev Kumar and Amritpal Kaur (2005)** also found 37% respondents use it for “Entertainment”. The findings of the study are in proximity to our results. Table 4.1.3 offers comprehensive details.

Table 4.1.3: purpose of e-mail

Purpose of e-mail	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM – Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Research	46 (76.66)	44 (73.33)	39 (65.00)	13 (65.00)	17 (85.00)	15 (75.00)	49 (81.66)	41 (68.33)	44 (73.33)	15 (75.00)	16 (80.00)	14 (70.00)	14 (70.00)	15 (75.00)	16 (80.00)	398 (73.70)
Personal matters	30 (50.00)	36 (60.00)	26 (43.33)	10 (50.00)	7 (35.00)	5 (25.00)	38 (63.33)	32 (53.33)	35 (58.33)	9 (45.00)	11 (55.00)	10 (50.00)	11 (55.00)	8 (40.00)	13 (65.00)	281 (52.03)
Entertainment	18 (30.00)	23 (38.33)	9 (15.00)	11 (55.00)	7 (35.00)	8 (40.00)	27 (45.00)	26 (43.33)	22 (36.66)	7 (35.00)	9 (45.00)	8 (40.00)	5 (25.00)	7 (35.00)	7 (35.00)	194 (35.92)

Figures in parenthesis indicate percentage

4.2 IDENTIFICATION OF WEB RESOURCES

4.2.1 Finding New URL's

The study reveals various modes of getting the URL's of web resources. "Search engine" is a most popular way of finding the new URLs among scholars (37.59%). The majority of scholars from NIT, Srinagar (60%) use it for identifying new URLs, while the small number of scholars (15%) belongs to IGI B- Delhi. No significant variation among research scholars of various institutes is indicated ($X^2=20.760$ and **P-Value = 0.108**) about using "Search engine" for finding new URLs. A study by Adika(2003) reveals 35.5% users prefer search engines to locate new URLs. Therefore, current findings are in line with the earlier study.

"Listserve" proves to be the second most preferred mode of identifying new URLs among scholars (34.44%). The maximum number of scholars of SKIMS(60%) call it a possible way of discovering new URLs followed by AIIMS(55%), whereas, the bottom most number of scholars (25%) belong to Kashmir University, Jamia Hamdard, NIMR-Delhi and CWDS – Delhi. The use of "Listserve" for finding new URLs among research scholars of different institutions varies significantly, as is evident from $X^2=50.894$ and **P-Value = 0.000**.

"Subject gateways" are the third popular mode of identifying new URLs with overall figure of 25.92%. At NIMR- Delhi majority of research scholars (40%) finds subject gateways a very useful source to identify new URLs. While as, the lesser proportion of researchers from IIM – Jammu (10%) use it. $X^2=19.286$ and **P-Value = 0.154** reveal no significant variation among research scholars of various institutes regarding use of "Subject gateways" for finding new URLs. Similarly Adika(2003) reports 23.7% of users exploit gateways to find the new URLs. It reveals that

in Ghana faculty members of different universities discover new sources of information more or less in same fashion as their Indian counterparts.

“Journal citations” have always proved to be a good source of identifying new sources of information irrespective of web or print format. But study finds that a small number of researchers (29.44%) are relying on this source. The study finds that majority of researchers at AIIMS (75%) consider it as source of new URLs and the least agree with this observation belong to NIMR-Delhi (15%). A significant variation among scholars of various institutions about using “Journal citations” for finding new URLs, is clear from chi square test ($X^2=59.528$ and **P-Value = 0.000**).

“Friends” prove to be the fifth big source of discovering the new URLs with overall use by 7.03% scholars. Twenty per cent of researchers at institutions like CWDS – Delhi and IEG – Delhi consider friends as source of new URLs, however researchers at SKUAST-K SKIMS and Jamia Millia Islamia do not think it as source of new URLs. Values of $X^2=25.364$ and **P-Value = 0.031** demonstrate a significant variation among research scholars of various institutions regarding it. “Teachers” are a source of inspiration and knowledge. The study found, in this fast moving world, teachers are still considered a source of direction and guidance. At SKIMS and AIIMS (15%) researchers find it an important source of finding new URLs, while CWDS – Delhi do not consider it a source. There is no significant variation among research scholars of various institutions regarding “Teachers” for finding new URLs, which is obvious from $X^2=13.592$ and **P-Value = 0.481**.

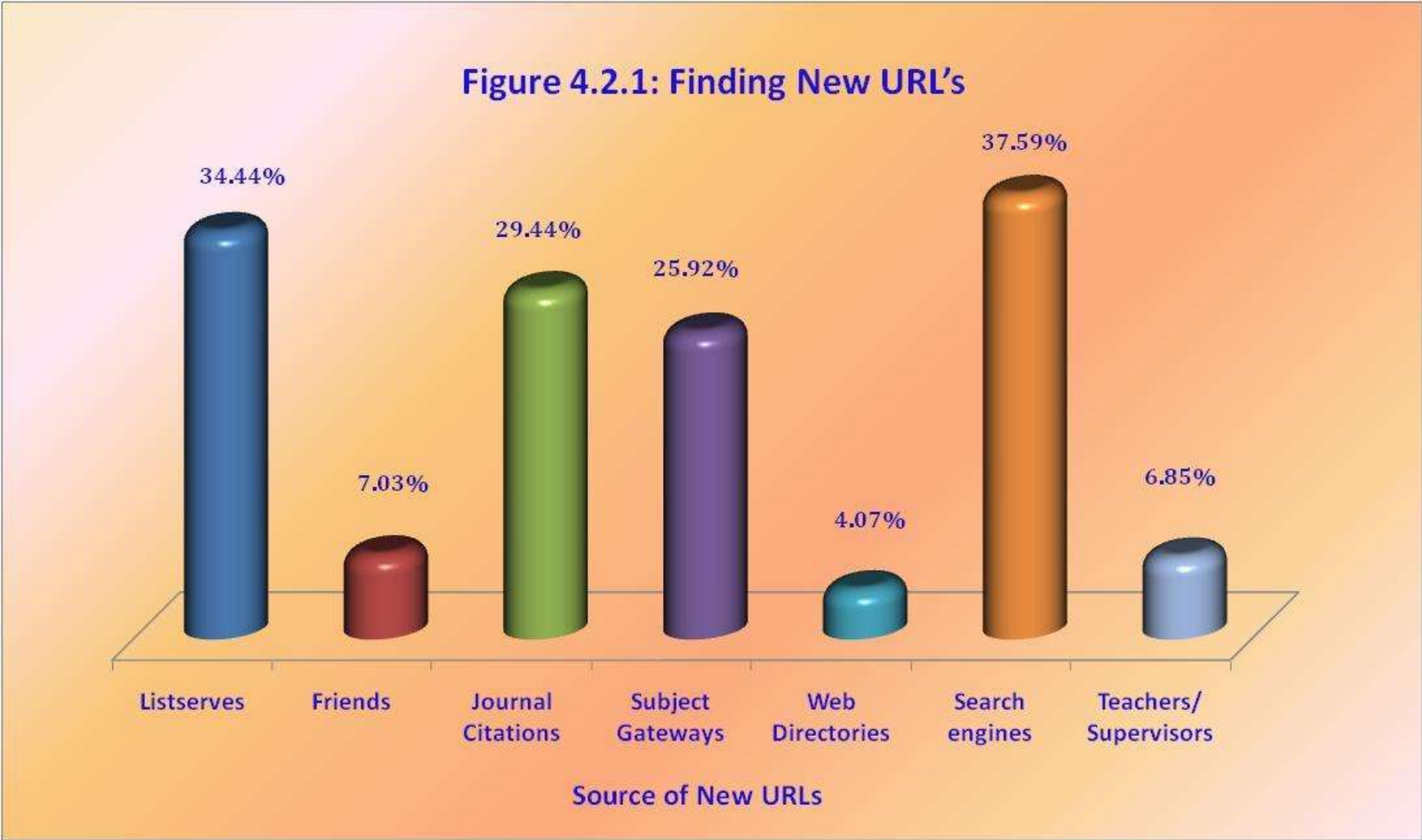
“Web directories” are given least preference as source of new URLs, since a small number of scholars (8.33%) at Kashmir University, SKUAST-K and Jamia Hamdard consider it a source, while researchers at NIT, Srinagar, SKIMS, IIM – Jammu, JNU, AIIMS, NISTDS – Delhi and CWDS – Delhi do not look at it as a source. The gateways and directories are not exploited by the scholars which may be either due to less awareness among scholars about various benefits of gateways or gateways are not updated regularly.

It is now obvious from the findings that online search tool and forums are biggest sources to identify new URLs, while as teachers and friends as a source have taken a backseat. Table 4.2.1 supplemented by Figure 4.2.1 provides a detailed account of facts and figures.

Table 4.2.1: Finding New URL's

Source of URLs	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Listserves	15 (25.00)	18 (30.00)	22 (36.66)	7 (35.00)	12 (60.00)	7 (35.00)	24 (40.00)	15 (25.00)	18 (30.00)	11 (55.00)	9 (45.00)	11 (55.00)	5 (25.00)	5 (25.00)	7 (35.00)	186 (34.44)
Friends	3 (5.00)	6 (10.00)	---	2 (10.00)	---	2 (10.00)	5 (8.33)	4 (6.66)	---	2 (10.00)	3 (15.00)	2 (10.00)	1 (5.00)	4 (20.00)	4 (20.00)	38 (7.03)
Journal Citations	18 (30.00)	12 (20.00)	18 (30.00)	5 (25.00)	14 (70.00)	12 (60.00)	15 (25.00)	11 (18.33)	10 (16.66)	15 (75.00)	7 (35.00)	5 (25.00)	3 (15.00)	7 (35.00)	7 (35.00)	159 (29.44)
Subject Gateways	17 (28.33)	15 (25.00)	21 (35.00)	4 (20.00)	4 (20.00)	2 (10.00)	8 (13.33)	15 (25.00)	22 (36.66)	3 (15.00)	5 (25.00)	7 (35.00)	8 (40.00)	4 (20.00)	5 (25.00)	140 (25.92)
Web Directories	5 (8.33)	2 (3.33)	5 (8.33)	---	---	---	---	5 (8.33)	2 (3.33)	---	1 (5.00)	---	1 (5.00)	---	1 (5.00)	22 (4.07)
Search engines	24 (40.00)	25 (41.66)	26 (43.33)	12 (60.00)	8 (40.00)	10 (50.00)	26 (43.33)	22 (36.66)	23 (38.33)	5 (25.00)	3 (15.00)	5 (25.00)	4 (20.00)	4 (20.00)	6 (30.00)	203 (37.59)
Teachers/ Supervisors	2 (3.33)	3 (5.00)	4 (6.66)	1 (5.00)	3 (15.00)	2 (10.00)	7 (11.66)	6 (10.00)	2 (3.33)	3 (15.00)	1 (5.00)	1 (5.00)	1 (5.00)	---	1 (5.00)	37 (6.85)

Figures in parenthesis indicate percentage



4.2.2 Primary Search Engine

The use of primary search engines is common among scholars. The study reveals that various search engines are employed by research scholars. “Google” is most popular search engine among the scholars (66.66%). The use varies between 70% at CWDS – Delhi and 91.66% at JNU. $X^2=14.200$ and **P-Value = 0.435** supports the view that no significant variation lies among research scholars of various institutions regarding use of “Google”. **Mohammad Nazim (2008)** has found 75.69% use “Google” which is higher compared to current findings. This could again be due to the homogeneous nature of the study, as Nazim’s study revolves around Aligarh Muslim University only.

“Yahoo” is the second most popular primary search engine among researchers (55%) of NIMR-Delhi and 25% among IIM – Jammu. The average figure comes to 39.25%. Again $X^2=9.940$ and **P-Value = 0.767** support the view that no significant variation occurs among research scholars of various institutions regarding use of “Yahoo”. **Mohammad Nazim (2008)** also shows almost similar results (42.15%). But a study of **Pangannaya and Kumar (2000)** report “Yahoo” most popular search engine among users (92%). The finding of Pangannaya and Kumar can be understood in the backdrop that the investigator conducted his research in year 2000, when “Google” was fairly new entrant in the market and as such popularity of “Yahoo”.

“AltaVista” is the third most popular search engine among the scholars (22.96%). At IEG – Delhi and NISTD- New Delhi majority of scholars (45%) use the search engine and the minimum belong to Kashmir University and SKUAST-K (20%), while researchers from two institutions viz Jammu University and SKIMS do not use it. Besides, a considerable variation among research scholars of various institutions is disclosed from $X^2=48.573$ and **P-Value = 0.000** regarding its use. **Pangannaya and Kumar (2000)** conclude 41% users exploit “Altavista” while **Mohammad Nazim (2008)** reports 28% use it.

Search engines, like “MSN Live”, “Gigablast” and “Lycos” are not much used by researcher scholars and their use varies between 4.07% - 8.51%. Time and again “Google” and “Yahoo” turn out to be more popular search engines in most studies, which confirm their wide coverage and effective ranking mechanism. Table 4.2.2 presents a comprehensive description of facts and figures.

Table 4.2.2: Use of Primary Search Engines

Primary Search Engine	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Google	49 (81.66)	52 (86.66)	45 (75.00)	18 (90.00)	18 (90.00)	15 (75.00)	55 (91.66)	48 (80.00)	49 (81.66)	17 (85.00)	15 (75.00)	18 (90.00)	15 (75.00)	14 (70.00)	15 (75.00)	360 (66.66)
Yahoo	24 (40.00)	27 (45.00)	17 (28.33)	10 (50.00)	7 (35.00)	5 (25.00)	22 (36.66)	24 (40.00)	25 (41.66)	9 (45.00)	9 (45.00)	7 (35.00)	11 (55.00)	8 (40.00)	7 (35.00)	212 (39.25)
AltaVista	12 (20.00)	---	12 (20.00)	6 (30.00)	---	4 (20.00)	15 (25.00)	18 (30.00)	14 (23.33)	10 (50.00)	3 (15.00)	9 (45.00)	5 (25.00)	7 (35.00)	9 (45.00)	124 (22.96)
MSN Live	12 (20.00)	14 (23.33)	---	---	8 (40.00)	---	8 (13.33)	---	---	---	---	---	4 (20.00)	---	---	46 (8.51)
Lycos	---	11 (18.33)	2 (3.33)	---	---	---	2 (3.33)	---	---	3 (15.00)	5 (25.00)	4 (20.00)	1 (5.00)	---	---	28 (5.18)
Gigablast	---	5 (8.33)	---	---	---	4 (20.00)	---	7 (11.66)	5 (8.33)	---	1 (5.00)	---	---	---	---	22 (4.07)

Figures in parenthesis indicate percentage

4.2.3 Meta-search Engines

Umpteen number of meta-search engines are available for retrieving information from World Wide Web. The present study made an endeavour to know the different meta-search engines used by the research scholars. “Dogpile” is employed by majority of scholars among all the institutions. The amount of use varies between 40% in AIIMS and NIMR-Delhi to 85% in Jammu University. A significant variation among research scholars of different institutions about use of “Dogpile” is clear from $X^2=36.987$ and **P-Value = 0.001**. Madhusudhan (2007) has also found high use of “Dogpile” among scholars (78%).

“search.com” is the second popular meta-search engine among scholars with around 10.18% scholars using it. The search engine is least used by the scholars (3.33%) of Kashmir University, while most scholars (30%) of IIM-Jammu, besides few institutions do not use it. $X^2=38.803$ and **P-Value = 0.000** show a significant variation among research scholars of different institutions about use of “search.com”

“Mamma” is also used by a small number of scholars (8.70%). The other search engines namely “go2net”, “c4” and “qbsearch” are exploited by fewer number of research scholar ranging between 5.92% - 7.59%. The use of “Mamma” among research scholars of different institutions varies considerably as indicated from $X^2=52.763$ and **P-Value = 0.000**.

The popularity of “Dogpile” is due to fact that it is one of oldest Meta-search engines. Secondly, it is found that the awareness level among the scholars regarding other meta-search engines is scarce to make them little useful for the users. And one more possible reason is *Googlisation* which has made everybody to perceive it as the only way to retrieve information and setting aside more effective means of retrieval like meta-search engines. Table 4.2.3 gives a complete picture of collected data.

Table 4.2.3: Use of Meta Search engine

Meta-search engine	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	N=540
Dogpile	45 (75.00)	51 (85.00)	43 (71.66)	12 (60.00)	11 (55.00)	10 (50.00)	42 (70.00)	32 (53.33)	37 (61.66)	8 (40.00)	11 (55.00)	9 (45.00)	8 (40.00)	14 (70.00)	12 (60.00)	345 (63.88)
Vivisimo	14 (23.33)	6 (10.00)	---	2 (10.00)	---	3 (15.00)	10 (16.66)	7 (11.66)	---	---	3 (15.00)	4 (20.00)	1 (5.00)	---	1 (5.00)	51 (9.44)
go2net	6 (10.00)	5 (8.33)	4 (6.66)	---	4 (20.00)	---	---	3 (5.00)	8 (13.33)	---	---	---	2 (10.00)	---	---	32 (5.92)
c4	---	4 (6.66)	1 (1.66)	2 (10.00)	---	---	7 (11.66)	---	2 (3.33)	3 (15.00)	3 (15.00)	3 (15.00)	2 (10.00)	3 (15.00)	3 (15.00)	33 (6.11)
mamma	12 (20.00)	5 (8.33)	8 (13.33)	---	---	1 (5.00)	3 (5.00)	15 (25.00)	---	---	3 (15.00)	---	---	---	---	47 (8.70)
qbsearch	5 (8.33)	6 (10.00)	---	4 (20.00)	4 (20.00)	---	---	3 (5.00)	8 (13.33)	4 (20.00)	---	---	4 (20.00)	3 (15.00)	---	41 (7.59)
Search.com	2 (3.33)	---	4 (6.66)	---	5 (25.00)	6 (30.00)	8 (13.33)	9 (15.00)	5 (8.33)	5 (25.00)	---	4 (20.00)	3 (15.00)	---	4 (20.00)	55 (10.18)

Figures in parenthesis indicate percentage

4.2.4 Special Search Engines

Special search engines are fast gaining ground among special type of clientele and index web resources pertaining to a subject / subject field or resources which cannot be indexed by primary search engines. As such it minimises the agony of special user to retrieve specific information related to their area of specialisation with much more ease and in a less time.

In this context “Scirus” happens to be the most popular special search engine among the scholars (44.42%). The search engine is most popular among researchers of IIM – Jammu (85%), while scholars of NIT, Srinagar (25%) use it least. A considerable variation among research scholars of different institutions is revealed from $X^2=84.661$ and **P-Value = 0.000** regarding use of “Scirus”. A study by Madhusudhan (2007) on internet use by research scholars in University of Delhi found that 78% of students are using “Scirus” for retrieving information. The study was confined to a single institution and as such higher use of search engine could be understood. Further, the present study does not contradict the findings of Madhusudhan as it also finds higher use of Scirus in IIM-Jammu (85%) and differs when present investigation demonstrate a cumulative use across the study.

CompletePlanet (2009) searches over 70,000+ searchable databases and specialty search engines. It is second popular special search engine preferred by IEG – Delhi (80%), whereas scholars (11.66%) of JNU least prefer it. $X^2=90.207$ and **P-Value = 0.000** mark a significant variation among researchers of various institutions regarding use of “CompletePlanet”.

Scitopia (2009) is a free federated search tool for scholarly literature of various leading science and technology publishers. “Scitopia” emerges third popular special search engine in the study used by 12.71% scholars. The maximum number of scholars (40%) of AIIMS makes its use, while scholars (8.33%) of Jamia Millia Islamia use it least. The use of “Scitopia” among the researchers of different institutions reveal a significant variation by calculating chi square test values ($X^2=53.956$ and **P-Value = 0.000**).

ScienceResearch(2009) is a free, publicly available deep web search engine that uses advanced "federated search technology" to return high quality results by submitting your search query - in real-time - to other well respected search engines then collating, ranking and dropping duplicates of the results. Similarly **searchedu(2009)** is an emerging search database which exclusively searches educational site and thus turns out to be very helpful for students and research community world over. But study found limited popularity of these two search engines among scholars. These search engines mutually share the fourth spot, both of them used by 10.80% of scholars. The optimum use of these special search engines is made by scholars of AIIMS (25%) and CWDS – Delhi (60%) respectively. $X^2=30.325$ and **P-Value = 0.007** of "Science search" and derived $X^2=86.501$ and **P-Value = 0.000** of "searchedu" reveal a significant variation among researchers of various institutions regarding their use. Special search engine "Fossick" is little known among the research scholars.

The special search engines is a recent phenomenon, therefore making inroads and gaining trust of user will take some more time to get desired popularity and place in search and retrieval arena. Thus, limited use among the scholars is clear. Table 4.2.4 offers a comprehensive description of facts and figures

Table 4.2.4: Use of Special Search Engines

Special Search engine	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Scirus	26 (43.33)	33 (55.00)	22 (36.66)	5 (25.00)	8 (40.00)	17 (85.00)	27 (45.00)	38 (63.33)	22 (36.66)	14 (70.00)	16 (80.00)	14 (70.00)	13 (65.00)	---	---	255 (44.42)
Scienceresearch	10 (16.66)	7 (11.66)	6 (10.00)	2 (10.00)	2 (10.00)	5 (25.00)	1 (1.66)	6 (10.00)	13 (21.66)	5 (25.00)	3 (15.00)	2 (10.00)	---	---	---	62 (10.80)
CompletePlanet	15 (25.00)	8 (13.33)	12 (20.00)	6 (30.00)	5 (25.00)	9 (45.00)	7 (11.66)	15 (25.00)	17 (28.33)	7 (35.00)	13 (65.00)	12 (60.00)	12 (60.00)	14 (70.00)	16 (80.00)	168 (29.26)
SearchEdu	7 (11.66)	12 (20.00)	---	---	---	---	11 (18.33)	12 (20.00)	8 (13.33)	---	---	---	---	12 (60.00)	---	62 (10.80)
Fossick	---	---	---	---	---	---	5 (8.33)	---	3 (5.00)	1 (5.00)	2 (10.00)	2 (10.00)	7 (35.00)	1 (5.00)	2 (10.00)	23 (4.00))
Scitopia	8 (13.33)	11 (18.33)	---	4 (20.00)	1 (5.00)	5 (25.00)	13 (21.66)	---	5 (8.33)	8 (40.00)	2 (10.00)	7 (35.00)	2 (10.00)	5 (25.00)	2 (10.00)	73 (12.71)

Figures in parenthesis indicate percentage

4.2.5 Web Directories

DOAJ(2010) covers free, full text, quality controlled scientific and scholarly journals on all subjects and languages. There are 5112 journals in the directory and 1947 journals are searchable at article level with 373342 articles included in the service. It is a preferred web directory among scholars (52.61%). The directory is very popular among scholars of I G I B-Delhi (85%) and least among Jamia Hamdard (45%) scholars. The optimal use of “DOAJ” is expected as research scholars often look for primary sources of information is emerging as the leading directory of open access primary resources. The use of the web directory by different institutions reveals a significant variation among the scholars ($X^2=48.564$ and **P-Value = 0.000**).

OpenDOAR(2010) is an authoritative directory of academic open access repositories. It enlists more than 1500 open access repositories on variety of subjects in different language from world over. The directory turns out to be the second popular web directory among scholars (48.60%). The scholars of NIMR-Delhi and I G I B-Delhi use it most (75%), in contrast scholars of SKIMS (20%) exploit the directory bare minimum. Like “DOAJ”, “OpenDOAR” is also fast becoming a leading directory to enlist open access repositories throughout the globe. $X^2=58.828$ and **P-Value = 0.000** reveal a significant variation in use of “OpenDOAR” among researchers of various institutions.

Web directory “Yahoo” is the third preferred directory among scholars (24.04%). The scholars of NIT, Srinagar highly prefer it (40%) followed by Jammu University (38.33%). On the contrary scholars of NISTDS -New Delhi (10%) exploit the directory least. It is quite obvious the usability of directory is half of what OpenDOAR that clearly indicates scholars do not access web directories extensively. Significant difference is not estimated in use of “Yahoo” web directory among the research scholars of different institutions as evident from $X^2= 22.077$ and **P-Value = 0.077**.

A good number of scholars (16.20%) also use “ROAR” with maximum scholars from NIMR-Delhi (60%) followed by IIM – Jammu (35%). While

the lowest use is made by researchers of Kashmir University and SKUAST-K (8.33%) and surprisingly scholars of NISTDS-New Delhi do not use the directory. The awareness level of “ROAR” among the scholars appears lower than the “OpenDOAR” and hence used by lesser proportion of scholars. Further $X^2=54.713$ and **P-Value = 0.000** reveal that a considerable variation regarding use of ROAR among scholars of different institutions.

A small number of researchers (11.32%) make use of web directory “Google”. The optimum use is made by the researchers of NIT, Srinagar (45%) followed by CWDS – Delhi (30%) and the poorest by Jamia Hamdard (3.33%). The popularity of “Google” directory being quite less than other directories among the scholars for the possible reason could be that Google is perceived to be a search engine by majority of users’ world-over than known for its web directory. $X^2=48.097$ and **P-Value = 0.000** disclose a great variation among scholars of different institutions in its use.

“DMOZ” is one more web directory used by 7.49% scholars with majority of them from IEG - Delhi (30%), while researchers of I G I B-Delhi do not use it. The values $X^2=21.730$ and **P-Value = 0.084** show use of “DMOZ” more or less similar among researchers of different institutions. Besides small number of research scholars (2.96% - 6.62%) makes use of web directories like Galaxy, Quest, Linkopedia, Web Beacon and MassiveLinks.

The findings show that primary literature web directories like “DOAJ” and “OpenDOAR” are more popular and exploited by researchers. This in turn reveals that the primary literature directories are gaining market and importance and conventional general directories may lose more ground in coming years due to effective subject and general gateways popping up in every field. Table 4.2.5 provides a detailed account of facts and figures.

Table 4.2.5: Use of Web Directories

Web Directories	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Yahoo (Directory)	17 (28.33)	23 (38.33)	12 (20.00)	8 (40.00)	5 (25.00)	8 (40.00)	15 (25.00)	17 (28.33)	14 (23.33)	4 (20.00)	5 (25.00)	2 (10.00)	---	5 (25.00)	3 (15.00)	138 (24.04)
Google (Directory)	12 (20.00)	8 (13.33)	5 (8.33)	9 (45.00)	3 (15.00)	3 (15.00)	5 (8.33)	2 (3.33)	3 (5.00)	2 (10.00)	---	2 (10.00)	---	6 (30.00)	5 (25.00)	65 (11.32)
Galaxy	5 (8.33)	2 (3.33)	---	2 (10.00)	---	---	---	2 (3.33)	3 (5.00)	---	1 (5.00)	2 (10.00)	---	---	---	17 (2.96)
Quest	---	3 (5.00)	3 (5.00)	3 (15.00)	---	2 (10.00)	3 (5.00)	---	2 (3.33)	3 (15.00)	2 (10.00)	---	---	1 (5.00)	---	22 (3.83)
DOAJ	38 (63.33)	32 (53.33)	35 (58.33)	14 (70.00)	12 (60.00)	15 (75.00)	30 (50.00)	27 (45.00)	31 (51.66)	16 (80.00)	17 (85.00)	10 (10.00)	12 (60.00)	---	13 (65.00)	302 (52.61)
DMOZ	2 (3.33)	7 (11.66)	4 (6.66)	2 (10.00)	2 (10.00)	2 (10.00)	4 (6.66)	3 (5.00)	3 (5.00)	2 (10.00)	---	1 (5.00)	2 (10.00)	3 (15.00)	6 (30.00)	43 (7.49)
Linkopedia	3 (5.00)	3 (5.00)	5 (8.33)	---	---	2 (10.00)	3 (5.00)	---	---	---	3 (15.00)	---	---	---	---	19 (3.31)

Table 4.2.5 Contd.

Web Beacon	---	2 (3.33)	3 (5.00)	5 (25.00)	2 (10.00)	---	---	---	1 (1.66)	2 (10.00)	---	---	---	2 (10.00)	1 (5.00)	18 (3.13)
MassiveLinks	5 (8.33)	8 (13.33)	3 (5.00)	3 (15.00)	3 (15.00)	---	3 (5.00)	3 (5.00)	1 (1.66)	---	---	---	1 (5.00)	3 (15.00)	5 (25.00)	38 (6.62)
OpenDOAR	22 (36.66)	27 (45.00)	25 (41.66)	5 (25.00)	4 (20.00)	14 (70.00)	29 (48.33)	37 (61.66)	32 (53.33)	14 (70.00)	15 (75.00)	14 (70.00)	15 (75.00)	14 (70.00)	12 (60.00)	279 (48.60)
ROAR	5 (8.33)	3 (5.00)	5 (8.33)	3 (15.00)	3 (15.00)	7 (35.00)	14 (23.33)	12 (20.00)	16 (26.66)	5 (25.00)	2 (10.00)	---	12 (60.00)	3 (15.00)	3 (15.00)	93 (16.20)

Figures in parenthesis indicate percentage

4.2.6 Subject Gateways

Subject gateways are considered a very significant organised list of web resources on a subject or a group of subjects. The information contained in these gateways is thoroughly reviewed by subject experts before they make it to the list of a gateway. In order to know the pattern of use of some well-known gateways the data collected reveal that the most popular subject gateway among researchers is “Virtual Library” a general gateway (43.51%). Most scholars (65%) of SKUAST-K use the gateway, whereas the least from SKIMS (15%) exploit it. The use of “Virtual Library” among researchers of various institutions shows significant variations as indicated from $X^2=32.065$ and **P-Value = 0.004**.

“Intute” turns out to be the second most popular subject gateway which is being exploited by good number of scholars (40.74%). The use of the gateway is made by the scholars (70%) associated with NISTDS -New Delhi, whereas the scholars belonging to SKIMS, AIIMS, I G I B-Delhi and NIMR-Delhi do not exploit it. Again, $X^2=92.935$ and **P-Value = 0.000** deciphers that a considerable variation exist among researchers of various institutions about its use.

The “SciCentral” is the third popular subject gateway used by 29.07% scholars. The optimum use is made by the scholars (75%) of NISTDS -New Delhi, while the scholars of SKIMS, IIIM – Jammu, CWDS – Delhi and IEG – Delhi do not use the gateway. The use of “SciCentral” among research scholars of different institutions varies considerably as indicated from $X^2=78.417$ and **P-Value = 0.000**.

The health sciences gateway “BIOME” ranks fourth (20.18%) among scholars. The gateway is used by the all scholars of SKIMS and AIIMS, however scholars of Jammu University, SKUAST-K, NIT, Srinagar, CWDS – Delhi and IEG – Delhi do not use it. Like “SciCentral”, use of “BIOME” also differs among researchers of different institutions as evident from $X^2=334.030$ and **P-Value = 0.000**.

Subsequently, the Subject gateway “AHDS” is exploited by small number of scholars (15%). The scholars (48.33%) associated with Jamia Millia Islamia mainly use it, while scholars of SKUAST-K, NIT, Srinagar, SKIMS, IIM – Jammu, Jamia Hamdard, AIIMS, I G I B-Delhi and NIMR-Delhi do not use the gateway as it is meant for the scholars of Art & Humanities not falling in the domain of their field.

“BIZ/ED” and “NBS” are two gateways specializing in subject fields of Business & Economics and Architecture & Engineering respectively and as such it is expected that a small number of scholars may be using these Meta-resources. It is found that 7.96% and 3.88% scholars are using them respectively. The chi square and P-value of “AHDS” “BIZ/ED” and “NBS” could not be ascertained as few institutions make use of these gateways. Hence variation in use is obvious.

The use of subject gateways doesnot appear popular like primary search engines and the possible reason may be lack of regular updationunlike search engines. The next possible reason could be lack of awareness among scholars about benefits of the gateways for getting information. Table 4.2.6 gives a thorough account of particulars and statistics.

Table 4.2.6: Use of Subject Gateways

Name of Subject Gateway	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Intute (General Gateway)	34 (56.66)	28 (46.66)	23 (38.33)	12 (60.00)	---	4 (20.00)	36 (60.00)	22 (36.66)	33 (55.00)	---	---	14 (70.00)	---	5 (25.00)	9 (45.00)	220 (40.74)
AHDS (Arts and Humanities)	10 (16.66)	14 (23.33)	---	---	---	---	24 (40.00)	---	29 (48.33)	---	---	---	---	4 (20.00)	---	81 (15.00)
SciCentral (Science)	16 (26.66)	21 (35.00)	14 (23.33)	4 (20.00)	---	---	15 (25.00)	29 (48.33)	16 (26.66)	7 (35.00)	12 (60.00)	15 (75.00)	8 (40.00)	---	---	157 (29.07)
BIOME (Health Sciences)	4 (6.66)	---	---	---	20 (100)	17 (85.00)	8 (13.33)	7 (11.66)	4 (6.66)	20 (100)	9 (45.00)	3 (15.00)	17 (85.00)	---	---	109 (20.18)
BIZ/ED(Business & Economics)	9 (15.00)	7 (11.66)	---	---	---	---	6 (10.00)	---	3 (5.00)	---	---	---	---	---	18 (90.00)	43 (7.96)
NBS(Architecture , Engineering,	---	---	---	11 (55.00)	---	---	3 (5.00)	---	---	---	---	7 (35.00)	---	---	---	21 (3.88)
Virtual Library (General Gateway)	26 (43.33)	19 (31.66)	39 (65.00)	8 (40.00)	3 (15.00)	9 (45.00)	33 (55.00)	25 (41.66)	21 (35.00)	5 (25.00)	11 (55.00)	11 (55.00)	9 (45.00)	9 (45.00)	7 (35.00)	235 (43.51)

Figures in parenthesis indicate percentage

4.2.7 Subject Databases

The databases make an important source of information for research community. The study investigated use of various databases among the researchscholars and found “Pubmed” the most popular and well utilised database among scholars (35.92%). The optimum use is made by the scholars (100%) of SKIMS, AIIMS and NIMR-Delhi, followed by researchers (85%) of IIM – Jammu. The scholars of SKUAST-K, NIT, Srinagar, CWDS – Delhi and IEG – Delhi do not use the database for the reason that it does not cover their area of research. Moreover, $X^2=234.458$ and **P-Value = 0.000** reveal that a significant variation among researchers of various institutions using “Pubmed”.

The second most exploited database among researchers is “ERIC Database”. It is utilized by 17.22% of researchers and majority among them are associated with Kashmir University (40%), while minimum number of scholars (6.66%) belongs to Jamia Hamdard. In addition scholars of NIT, Srinagar; SKIMS, IIM – Jammu; AIIMS; I G I B-Delhi; NIMR-Delhi; SKUAST-K and NISTDS -New Delhi do not use the database. A considerable variation among scholars of different institutions exist as clear from $X^2=127.664$ and **P-Value = 0.000** about use of “ERIC Database”.

The database “SciBase” is also exploited by a good number of scholars (15.37%). The most number of scholars (45%) belongs to NIT, Srinagar, while scholars of Jamia Millia Islamia; CWDS – Delhi and IEG – Delhi do not use it. It is found from $X^2= 69.388$ and **P-Value = 0.000** a significant variation lies among researchers of various institutions in using “SciBase”.

EBSCO database “Academic Search Elite” is exploited by about 11.48% of scholars across the study and most of researchers (30%) belongs to Jamia Millia Islamia and minimum use is made by scholars (18.33%) of Jammu University and Jamia Hamdard. Out of 15 institutions scholars of 10 institutions does not use the database. $X^2=72.692$ and **P-Value = 0.000** data also confirms significant variation among researchers of different institutions regarding use of EBSCO database.

“UNESCO’s Social Science Database” and “LexisNexis Academic Database” are also used by a small number of researchers across various institutions and the aggregate use by the scholars is 11.29% and 8.51% respectively. Its use varies among the researchers of different institutions as revealed from $\chi^2=53.529$ and **P-Value = 0.000** in UNESCO’s Social Science Database and $\chi^2= 39.970$ and **P-Value = 0.000** for LexisNexis Academic databases respectively.

The high use of science databases could be attributed to high awareness of these resources by researchers. Table 4.2.7 presents a comprehensive account of facts and figures.

Table 4.2.7: Use of Subject Databases and repositories

Name of Subject Database	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM – Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Pubmed	12 (20.00)	18 (30.00)	---	---	20 (100.00)	17 (85.00)	21 (35.00)	27 (45.00)	14 (23.33)	20 (100.00)	18 (90.00)	7 (35.00)	20 (100)	---	---	194 (35.92)
ERIC Database	24 (40.00)	18 (30.00)	---	---	---	---	15 (25.00)	4 (6.66)	9 (15.00)	---	---	---	---	14 (70.00)	9 (45.00)	93 (17.22)
SciBase	7 (11.66)	10 (16.66)	25 (41.66)	9 (45.00)	2 (10.00)	4 (20.00)	5 (8.33)	8 (13.33)	---	5 (25.00)	3 (15.00)	3 (15.00)	2 (10.00)	---	---	83 (15.37)
UNESCO's Social Science	5 (8.33)	5 (8.33)	---	---	---	---	11 (18.33)	3 (5.00)	10 (16.66)	---	---	---	---	14 (70.00)	13 (65.00)	61 (11.29)
LexisNexis Academic	9 (15.00)	8 (13.33)	---	4 (20.00)	---	---	7 (11.66)	6 (10.00)	12 (20.00)	---	---	---	---	---	---	46 (8.51)
Academic Search Elite	15 (25.00)	11 (18.33)	---	---	---	---	17 (28.33)	11 (18.33)	18 (30.00)	---	---	---	---	---	---	62 (11.48)

Figures in parenthesis indicate percentage

4.2.8 Journal Identification and Use(Publisher Distribution)

A number of distinguished publishers publish world's major portion of primary literature in different fields of knowledge. In order to know proportion of their publications utilized by the researchers the data was collected. It is found that journals from "Springer" are utilized by the majority of scholars (38.14%). The maximum use of journals published by "Springer" is found among the scholars (80%) of AIIMS& NIT, Srinagar, while the scholars of SKUAST-K, SKIMS, NIMR-Delhi and CWDS – Delhi do not use their journals. The reason for not using journals of "Springer" by the scholars of these institutions is either due to non-availability or not falling in their area of research. $X^2=138.791$ and $P\text{-Value} = 0.000$ also decipher a considerable variation among researchers of different institutions about use of journals published by Springer. A study by **Moghaddam and Talawar (2008)** found journals of "Springer" are used by 34.76% users which is almost similar to the present findings.

"Blackwell Publishers" turns out second most exploited publisher of journals among the scholars (33.14%). The maximum use of its journals is made by the scholars (80%) of AIIMS, while minimum is made by the scholars (25%) of NIMR-Delhi. In addition scholars of seven institutions under study do not utilize it. Further, researchers of different institutions do not make similar use of journals published by "Blackwell" which is also revealed from values of $X^2= 170.643$ and $P\text{-Value} = 0.000$. In a study **Moghaddam and Talawar (2008)** found only 9.82% respondents use journals of "Blackwell publishers". A study assessing the use of UGC INFONET e-journals consortium in 9 North East universities by **Prem Chand, Satyabati Devi and Chauha (2006)** report that in 2005, 11.57% downloads were made from Blackwell online e-journal database.

"Elsevier Science" ranks third in making use of their journals by 30.74% researchers. The maximum use of its journals is seen among the scholars (100%) of NIT, Srinagar, AIIMS and NISTDS -New Delhi, while as minimum is noted from scholars (36.66%) of Kashmir University. The scholars of

SKUAST-K, SKIMS, JNU, Jamia Hamdard, Jamia Millia Islamia and CWDS – Delhi do not utilise its resources. $X^2=342.106$ and **P-Value = 0.000** indicate a significant variation among research scholars of various institutions about its journals. A study by **Moghaddam and Talawar (2008)** found that around 63.97% respondents use “Elsevier Science” journals. The optimum use could be attributed to the fact that the study was confined to just one institution namely Indian Institute of Science and happens to be one of India’s best known institutions in terms of resources.

“Taylor and Francis” receives fourth rank for being used by around 22.22% scholars. The premier use is made by the scholars (70%) of I G I B-Delhi; while a minuscule number of scholars (23.33%) associated with Jamia Millia Islamia exploit the resource. Furthermore, scholars of seven institutions do not use the online journal resources of the publisher. $X^2=122.079$ and **P-Value = 0.000** show a significant variation among research scholars of different institutions in use of their journals. A study shows 5.79% respondent use “Taylor & Francis” group journals (**Moghaddam and Talawar, 2008**). **Prem Chand, Satyabati Devi and Chauha (2006)** found Taylor and Francis online e-journal database constitute 8.34% of total downloads. The underlying reason for variation in use can be attributed to many factors discussed below. Besides, journals of publishers like “Sage” and “Emerald” are also exploited by the researchers in a limited number, viz 10.92% and 3.33% respectively. The journal publisher “Kluwer online” is not utilized by any scholar across all the institutions. Therefore chi and P values could not be ascertained. The limited use of some of the journal publishers is due to the fact that either they are not being subscribed by the institution or not falling in the area of research of a scholar. Many other indicators can be responsible for various users like marketing of publishers, language, scope of subjects vis-à-vis institutions, size of database and degree of awareness among scholars. Table 4.2.8 offers a complete account of facts and figures

Table 4.2.8: Journal Resources Use (Publisher Wise Distribution)

Online Journal Publishers	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Blackwell Publishers	26 (43.33)	21 (35.00)	---	---	---	11 (55.00)	36 (60.00)	41 (68.33)	23 (38.33)	16 (80.00)	---	---	5 (25.00)	---	---	179 (33.14)
Kluwer Academic Publishers	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Elsevier Science	22 (36.66)	27 (45.00)	---	20 (100)	---	14 (70.00)	---	---	---	20 (100)	18 (90.00)	20 (100)	17 (85.00)	---	8 (40.00)	166 (30.74)
Springer	26 (43.33)	20 (33.33)	---	16 (80.00)	---	9 (45.00)	32 (53.33)	35 (8.33)	19 (31.66)	16 (80.00)	12 (60.00)	15 (75.00)	---	---	6 (30.00)	206 (38.14)
Emerald	7 (11.66)	---	---	---	---	---	7 (11.66)	---	4 (6.66)	---	---	---	---	---	---	18 (3.33)
Taylor and Francis	18 (30.00)	15 (25.00)	---	---	---	---	27 (45.00)	21 (35.00)	14 (23.33)	---	14 (70.00)	11 (55.00)	---	---	---	120 (22.22)
Sage Publications	---	---	---	---	---	---	28 (46.66)	---	---	---	17 (85.00)	14 (70.00)	---	---	---	59 (10.92)

Figures in parenthesis indicate percentage

4.2.9 Journal Portals Identification and Use (Societies and Institution Distribution)

Many online journal portals of scholarly societies and academic institution are available and an endeavour was made to ascertain their use and popularity among the scholars. It is found that “Cambridge University Press” resources are highly exploited by scholars (30.55%). The majority of scholars (60%) associated with NISTDS -New Delhi makes use of the journal portal, while only 20% scholars of SKIMS use it. Besides, scholars of SKUAST-K, NIT, Srinagar, IIIM – Jammu, AIIMS and CWDS – Delhi do not use its resources. $X^2=103.680$ and **P-Value = 0.000** indicate a significant variation among researchers of different institutions about use of “Cambridge University Press” journals. **Moghaddam and Talawar (2008)** found only 16.87% respondents use “Cambridge University Press” journals. The contrasting findings are expected given the wide scope of the current study in comparison to Moghaddam and Talawar who studied use pattern in a single institution.

The journal portal of “Oxford University Press” ranks second (21.11%). The maximum number of scholars (85%) associated with AIIMS uses the portal, while the minimum scholars (20%) belong to NIMR-Delhi. Besides, scholars of 7 institutions do not use the portal. Use of “Oxford University Press” journals among research scholars of various institutions reveals considerable variation is obvious from $X^2=169.526$ and **P-Value = 0.000**. **Moghaddam and Talawar (2008)** also found somewhat similar findings. They found around 15.11% respondent make use of “Oxford University Press” journals which is slightly lower than the present findings. **Prem Chand, Satyabati Devi and Chauha (2006)** observed users made 6.20% downloads from “Oxford University Press” e-journal database in 9 North Eastern universities of India during 2005.

“American Chemical Society” ranks third in use by around 17.59% scholars. The optimum use is made by the scholars (70%) of I G I B-Delhi and the minimum is made by the scholars (8.33%) of Jammu University. The scholars of 5 institutions do not use the portal. Moreover, a significant variation among researchers of different institutions about using journal resources of “American Chemical Society” is indicated from $X^2=109.699$ and **P-Value = 0.000**. The

findings of **Moghaddam and Talawar(2008)** also establish that around 23.42% respondents use journals published by “American Chemical Society”. It contributed 34.74% downloads for the year 2005 (**Prem Chand, Satyabati Devi and Chauha2006**), making it most popular e-journal database in North Eastern universities.

“Academic Press” is also turning out to be a very useful resource for the scholars (11.29%). The large number of scholars (51.66%) of Jammu University make use of it followed by scholars (41.66%) of Kashmir University and IEG – Delhi(25%), while rest of institutions do not use the portal. $X^2=207.304$ and **P-Value = 0.000** reveal a substantial variation among research scholars of various institutions about use of “Academic Press” journals.

“ACM portal” being one of the very important portals in engineering and allied sciences is utilised by 11.11% researchers. The optimum use is made by the scholars of NISTDS -New Delhi followed by scholars (60%) belonging to NIT, Srinagar, while scholars of ten institutions do not exploit the portal. $X^2=198.450$ and **P-Value = 0.000** show a significant variation among researchers of different institutions. Similarly 12.59% respondents in study of **Moghaddam and Talawar(2008)** were identified using journals published by ACM.

In addition journal portals of “American Institute of Physics” and “IEEE Library” is also utilised by small number of scholar. The “American Institute of Physics” is exploited by 9.25% scholars and “IEEE Library” by 6.29% scholars. $X^2=134.576$ and **P-Value = 0.000** of “IEEE” and $X^2=180.955$ and **P-Value= 0.000** of “American Institute of Physics” reveal a considerable variation among researchers of various institutions in use of these journal resources.

The limited use of some of the journal publishers is due the fact that either they are not being subscribed by the institution or not falling in the area of research of a scholar. Table 4.2.9 presents a comprehensive account of facts and figures.

Table 4.2.9: Journal Resources portals Identification and Use (Scholarly Societies and Academic Institutions Wise Distribution)

Scholarly Societies and Academic Institutions	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
ACM (American Computing Machinery)	---	---	---	12 (60.00)	---	---	15 (25.00)	---	14 (23.33)	---	4 (20.00)	15 (75.00)	---	---	---	60 (11.11)
IEEE Library	---	---	---	10 (50.00)	---	---	15 (25.00)	---	9 (15.00)	---	---	---	---	---	---	34 (6.29)
American Chemical Society	7 (11.66)	5 (8.33)	---	4 (20.00)	---	7 (35.00)	11 (18.33)	24 (40.00)	8 (13.33)	---	14 (70.00)	8 (40.00)	7 (35.00)	---	---	95 (17.59)
American Institute of Physics	4 (6.66)	3 (5.00)	---	12 (60.00)	---	---	9 (15.00)	8 (13.33)	---	---	---	14 (70.00)	---	---	---	50 (9.25)
Cambridge University Press	28 (46.66)	23 (38.33)	---	---	4 (20.00)	---	23 (38.33)	24 (40.00)	32 (53.33)	---	10 (55.00)	12 (60.00)	4 (20.00)	---	5 (25.00)	165 (30.55)

Table 4.2.9Contd.

Academic Press	25 (41.66)	31 (51.66)	---	---	---	---	---	---	---	---	---	---	---	---	5 (25.00)	61 (11.29)
Oxford University Press	---	---	---	---	6 (30.00)	---	22 (36.66)	20 (33.33)	26 (53.33)	17 (85.00)	8 (40.00)	11 (55.00)	4 (20.00)	---	---	114 (21.11)

Figures in parenthesis indicate percentage

4.3 WEB RESOURCES AWARENESS

4.3.1 Web Resources Awareness

Web resources are available in variety of forms and researchers are aware with most of them. Most popular web resource among research scholars are “Online Journals” (100%) and “E-Books” (100%). These make a unanimous choice among scholars irrespective of the institution. A study of **Mohammad Nasir Uddin (2003)** carried in a university of Bangladesh also found that users (100%) are aware with the “e-books” and “online journals”. The findings of Nasir Uddin are more relevant as Bangladesh form a part of south Asia, with more or less similar socio- educational standards and therefore awareness level.

“Wikis” are of recent origin, fast becoming one of the popular information resources on the web. They turn out to be the second most popular information resource known to research scholars (82.40%). All researchers (100%) from IIM – Jammu, AIIMS, I G I B-Delhi, NISTDS -New Delhi, NIMR-Delhi and IEG – Delhi are aware of “Wikis”, with sizeable number of scholars from Kashmir University (56.66%). $X^2=71.762$ and **P-Value = 0.000** divulges a significant variation about awareness level among scholars of different institutions. A study by **Majchrzak, Wagner and Yates (2005)** revealed whopping 92.85% awareness and use of wikis among users.

“Blogs” rank third in popularity among research scholars (79.25%). Scholars (100%) of SKIMS, IIM – Jammu, AIIMS, I G I B-Delhi, NISTDS -New Delhi, NIMR-Delhi, CWDS – Delhi and IEG - Delhi are aware of the web resource, whereas the least awareness is noted among the scholars of Kashmir University (46.66%). A significant variation is noted among research scholars of different institutions deciphered from $X^2=105.260$ and **P-Value = 0.000**.

“ETDs” are a web resource emerging strongly and receiving great attention for their development all over the world. These are becoming popular especially among researchers. All scholars (100%) of NISTDS -New Delhi and NIMR-Delhi are aware about them while researchers (50%) of NIT-Srinagar are not much aware about them. The values of $X^2=61.590$ and **P-Value = 0.000** reveal a considerable variation in their use among researchers of different institutions. **Rajeev Kumar and Amritpal Kaur (2005)** found that 25.5% respondents are aware and exploit “ETDs” which is below from the findings of the current study. The reason for less use of “ETDs” among the respondents may be due to the confinement of study among undergraduate engineering students and teachers which normally not use thesis literature.

Scholars possess good awareness of Databases which rank 5th in popularity with an average level of 52.96%. The resource is most popular among research scholars of SKIMS (90%), while it is least known to scholars (35%) of CWDS – Delhi. $X^2=62.189$ and **P-Value = 0.000** show a significant variation among research scholars of different institutions about awareness of databases. **Scoyoc, Van and Cason (2006)** ascertained that online databases (19.6%) are not much popular among users and it contradicts with the findings of the present study. This could be because of time gap between the previous and the present study or due to limited awareness of online databases among the under graduate students which form the focus of their study. **Oliver (1998)** reveals that medical students in Germany (28.8%) are aware about online database and also make use of them.

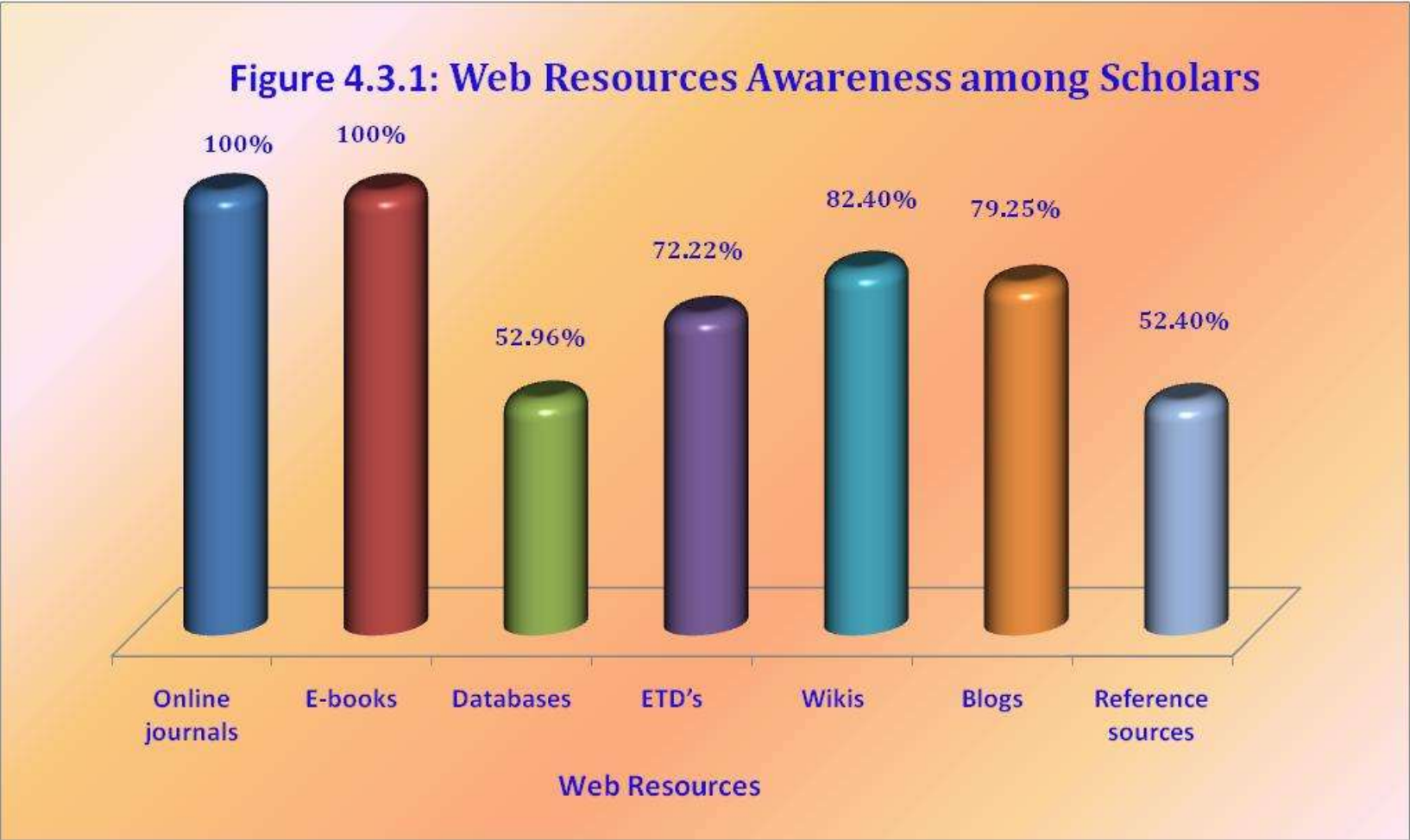
“Reference sources” are always one of the indispensable resources for researchers and as such should normally have high awareness level among the scholars. However, only 52.40% researchers are aware of their web existence and are most popular among researchers (70%) of IIM – Jammu, JNU and AIIMS, while scholars (35%) of SKIMS and I G I B-Delhi are least aware about them. $X^2=20.730$ and **P-Value = 0.109** reveals no significant variation among the research scholars of various institutions about using reference sources. A study by **Vakkari (2005)** found 28% users are aware and utilise reference sources.

It is obvious that journals and e-books are popular web resources and other web resources are fast gaining credence and popularity. In coming years with further advancement of web technology more awareness and use of array of web resources is imminent. Table 4.3.1 & Figure 4.3.1 provides a complete description of facts and figures.

Table 4.3.1: Web Resources Awareness among Scholars

Type of Web Resource	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Online journals	60 (100)	60 (100)	60 (100)	20 (100)	20 (100)	20 (100)	60 (100)	60 (100)	60 (100)	20 (100)	20 (100)	20 (100)	20 (100)	20 (100)	20 (100)	540 (100)
E-books	60 (100)	60 (100)	60 (100)	20 (100)	20 (100)	20 (100)	60 (100)	60 (100)	60 (100)	20 (100)	20 (100)	20 (100)	20 (100)	20 (100)	20 (100)	540 (100)
Databases	25 (41.66)	22 (36.66)	40 (66.66)	12 (60.00)	18 (90.00)	15 (75.00)	33 (55.00)	21 (35.00)	22 (36.66)	17 (85.00)	12 (60.00)	15 (75.00)	14 (70.00)	7 (35.00)	13 (65.00)	286 (52.96)
ETD's	45 (75.00)	41 (68.33)	36 (60.00)	10 (50.00)	13 (65.00)	17 (85.00)	53 (88.33)	51 (85.00)	37 (61.66)	19 (95.00)	19 (95.00)	20 (100)	20 (100)	17 (85.00)	19 (95.00)	417 (72.22)
Wikis	34 (56.66)	45 (75.00)	47 (78.33)	18 (90.00)	19 (95.00)	20 (100)	43 (71.66)	55 (91.66)	45 (75.00)	20 (100)	20 (100)	20 (100)	20 (100)	19 (95.00)	20 (100)	445 (82.40)
Blogs	28 (46.66)	35 (58.33)	41 (68.33)	18 (90.00)	20 (100)	20 (100)	49 (81.66)	52 (86.66)	45 (75.00)	20 (100)	20 (100)	20 (100)	20 (100)	20 (100)	20 (100)	428 (79.25)
Reference sources	32 (53.33)	24 (40.00)	31 (51.66)	9 (45.00)	7 (35.00)	14 (70.00)	42 (70.00)	33 (55.00)	29 (48.33)	14 (70.00)	7 (35.00)	13 (65.00)	9 (45.00)	9 (45.00)	10 (50.00)	283 (52.40)

Figures in parenthesis indicate percentage



4.3.2 Identification

Scholars identify new web resources through different modes and most popular way of determining new resources among research scholars is “Trial and Error” (58.71%). Majority of scholars of NIT, Srinagar (90%) learn about new web resource through this mode, while a small number of researchers from NISTDS -New Delhi (25%) employ the same way. Research scholars of different institutions vary in using “Trial and Error” technique for identifying new resources, which is evident from $X^2=73.188$ and $P\text{-Value} = 0.000$. **Ray and Day (1998)** also find higher use of “Trial and Error” to discover new web resources (78.7%). This higher use could be understood in light of the fact that during last one decade people shared knowledge of new resources less through different online channels and used often offline mechanism.

Library staff turns out to be the second (34.44%) best helping hand in guiding research scholar to new web resources. The scholars (55%) associated with AIIMS, I G I B-Delhi and CWDS – Delhi consider library staff very important link between new web resources and the scholars, while a small number of researchers (25%) associated with SKUAST-K and NIT, Srinagar believe it so. $X^2=24.800$ and $P\text{-Value} = 0.037$ indicates a significant variation among research scholars of different institutions about taking the support of Library staff in locating new resources. The study of **Ray and Day (1998)** reports that guidance from library staff in identifying new web resources is higher (54.20%) than the present study. This can be due to the fact that United Kingdom has a better library support compared to India.

Besides above modes awareness courses offered by the institution rank third in learning about new web resources. On average, 12.03% scholars learn about new resources through awareness courses offered by the parent institution with majority of scholars in AIIMS (60%) get awareness through this mode and minuscule number of scholars from JNU (13.33%) avail the service. Besides scholars of nine institutions reveal no such programme is being conducted by parent institution. $X^2=168.672$ and $P\text{-Value} = 0.000$ divulge a considerable variation among researchers of different institutions in joining

such programmes in identifying new resources. **Pangannaya and Kumar (2000)** have identified that 21% of research scholars learn about new web resources through programmes run by institutions. The higher use here can be attributed to the limited scope of the study.

Research scholars of some of the institutions (2.61%) do acquaint themselves with new web resources through courses offered by private institutions. A small number of scholars from AIIMS, NIMR-Delhi, IEG – Delhi (20%) and CWDS – Delhi (15%) do get awareness of new web resources through courses offered by private institutions.

The findings make it clear that “Trial & Error” mode is the most popular way of locating web resources which in turn implies that scholars are not familiar with proper searching techniques, therefore rely on unsystematic approach. Besides, library staff needs to offer more help in terms of web orientation courses to elevate the online searching skills of scholars. Table 4.3.2 provides a complete description of facts and figures.

Table 4.3.2: Modes of Locating Web Resources

Modes of Location	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Trial and Error	42 (70.00)	47 (78.33)	26 (43.33)	18 (90.00)	17 (85.00)	15 (75.00)	37 (61.66)	43 (71.66)	47 (78.33)	9 (45.00)	9 (45.00)	5 (25.00)	7 (35.00)	6 (30.00)	9 (45.00)	337 (58.71)
Guidance from the library staff	18 (30.00)	13 (21.66)	15 (25.00)	5 (25.00)	7 (35.00)	10 (50.00)	20 (33.33)	17 (28.33)	23 (38.33)	11 (55.00)	11 (55.00)	9 (45.00)	9 (45.00)	11 (55.00)	7 (35.00)	186 (34.44)
Course offered by the Institutions	---	---	19 (31.66)	---	---	8 (40.00)	8 (13.33)	---	---	12 (60.00)	---	8 (40.00)	10 (50.00)	---	---	65 (12.03)
Course done at a Private Institution	---	---	---	---	---	---	---	---	---	4 (20.00)	---	---	4 (20.00)	3 (15.00)	4 (20.00)	15 (2.61)

Figures in parenthesis indicate percentage

4.3.3 Awareness about Online Journals

It is found that all research scholars (100%) irrespective of the institution are aware about “Academic/ Scholarly Journals” available through online mode. This is quite expected as “Academic/ Scholarly Journals” are primary source of every researcher irrespective of the discipline and institution he/she may belong.

Most of the researchers (74.07%) are aware with the online “Current Affairs/Opinion magazines”. The optimum awareness of these online magazines is found among researcher scholars of Jamia Millia Islamia (91.66%) and the least is reported among researchers of NIMR-Delhi (45%). A comparatively less awareness of online “current affairs/opinion magazines” may be due to the fact that these might not be appealing to some users for not being directly related to their area of research and interest. The awareness level among research scholars of the institutions varies considerably, which is evident from $X^2=51.223$ and **P-Value = 0.000**. **Bevan, Nieminen, Hunn and Sweet (2001)** report 77% are aware of their existence, while **Borrego, Anglada, Barrios, and Comellas (2007)** reveal 95.3% users are aware with online academic journals and current affairs magazines.

“Trade journals” are least popular among the researchers and only few are aware about web existence. Most researchers (8.33%) acquainted about web presence belong to Jammu University, JNU and Jamia Millia Islamia, while 5% are from Kashmir University. Scholars of other institutions except Jamia Hamdard (6.66%) are not aware about “Trade journals”. The awareness level of “Trade journals” is registered similar among the research scholars of different institutions as indicated from $X^2=19.712$ and **P-Value = 0.090**. Table 4.3.3 gives a comprehensive account of particulars and statistics.

Table 4.3.3: Awareness about Different Types of Online Journals

Type of Online Journal	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Academic/ Scholarly Journals	60 (100)	60 (100)	60 (100)	20 (100)	20 (100)	20 (100)	60 (100)	60 (100)	60 (100)	20 (100)	20 (100)	20 (100)	20 (100)	20 (100)	20 (100)	540 (100)
Trade Journals	3 (5.00)	5 (8.33)	---	---	---	---	5 (8.33)	4 (6.66)	5 (8.33)	---	---	---	---	---	---	22 (4.07)
Current Affairs/Opinion magazines	44 (73.33)	51 (85.00)	46 (76.66)	14 (70.00)	9 (45.00)	15 (75.00)	47 (78.33)	43 (71.66)	55 (91.66)	16 (80.00)	12 (60.00)	10 (50.00)	7 (35.00)	18 (90.00)	13 (65.00)	400 (74.07)

Figures in parenthesis indicate percentage

4.3.4 Awareness about Online Databases

The awareness level of different online databases varies drastically among the researchers. The awareness about “Full-text” databases among scholars is quite high (72.59%) and the optimum is found among researchers (95%) of AIIMS and least among scholars of Jamia Millia Islamia and IEG – Delhi (55%). The high awareness and popularity of the databases is understandable for offering full articles. However, the acquaintance of the full-text databases significantly varies among the research scholars of the institutions as deciphered from $X^2=36.375$ and **P-Value = 0.001**. **Vibert et al (2007)** also reveals that 96.5% researchers are aware and use full-text databases.

The second most popular online database among research scholars is “Bibliographic” database estimating its awareness 40.55% among scholars across all institutions. The most of scholars aware about “Bibliographic” databases belong to AIIMS (65%) and the minuscule proportion comes from Jamia Hamdard (18.33%). Before the advent of full text databases these were the most sought resources and their awareness and popularity has gone down over the years for emergence of full text. $X^2=42.310$ and **P-Value = 0.000** clearly indicates a considerable variation among the researchers of different institutions about awareness of “Bibliographic” databases. **Vibert et al (2007)** reports 29.5% researchers are aware and use “Bibliographic” databases, while **Bonthron et al (2003)** found 16.3% only.

Small group of researchers (10%) are aware with the “Numeric databases” mainly hailing from NIT, Srinagar (45%) and none from SKIMS, AIIMS and IGIB- Delhi. Since “Numeric” databases are more prominent in engineering and statistical subject, therefore limited familiarity of databases among research scholars of such institutions is expected. The awareness of numeric databases significantly varies among the research scholars of different institutions, as is evident from $X^2=45.926$ and **P-Value = 0.000**.

“Referral or Directory” databases have least awareness among researchers and small percentage (8.88%) are acquainted about them. Most scholars (25%) are from AIIMS, while scholars from Jammu University, SKUAST-K and

NISTDS -New Delhi are not aware. Once again, as per $\chi^2=58.034$ and **P-Value = 0.000** the variation in awareness among the researchers of various institutions is quite significant.

The findings are quite expected and do not show any unusual pattern. The popularity of “Full-text” database is very much expected and would gain more and more significance in coming years. Table 4.3.4 provides a detailed picture of facts and figures.

Table 4.3.4: Awareness about Different types of Online Databases

Type of Online Database	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM – Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Full Text Databases	47 (78.33)	42 (70.00)	51 (85.00)	14 (70.00)	18 90.00	13 (65.00)	49 (81.66)	37 (61.66)	33 (55.00)	19 (95.00)	17 (85.00)	14 (70.00)	12 (60.00)	15 (75.00)	11 (55.00)	392 (72.59)
Bibliographic Databases	24 (40.00)	29 (48.33)	32 (53.33)	6 (30.00)	7 (35.00)	8 (40.00)	35 (58.33)	11 (18.33)	15 (25.00)	13 (65.00)	11 (55.00)	9 (45.00)	7 (35.00)	7 (35.00)	5 (25.00)	219 (40.55)
Numeric Databases	6 (10.00)	9 (15.00)	---	9 (45.00)	---	2 (10.00)	6 (10.00)	8 (13.33)	5 (8.33)	---	---	1 (5.00)	2 (10.00)	2 (10.00)	4 (20.00)	54 (10.00)
Referral or Directory Databases	3 (5.00)	---	---	1 (5.00)	5 (25.00)	4 (20.00)	9 (15.00)	2 (3.33)	3 (5.00)	7 (35.00)	4 (20.00)	---	5 (25.00)	3 (15.00)	2 (10.00)	48 (8.88)

Figures in parenthesis indicate percentage

4.3.5 Awareness about Online References Sources

“Online Encyclopaedia” is most popular reference source among research scholars. All scholars (100%) are aware with online encyclopaedias irrespective of the institution.

“Online Dictionaries” are the second most known reference source amongst researchers (84.81%). The optimum awareness of online dictionaries is seen among researchers (100%) of NISTDS-New Delhi and SKIMS and the minimal among researchers of IEG – Delhi (75%). Moreover, $X^2=24.443$ and **P-Value = 0.040** indicate a significant variation among the research scholars of different institutions about awareness of online dictionaries.

“Online Thesaurus” is also very popular among the researchers (33.88%) and most researchers are aware about their online existence. The majority of scholars (70%) of NISTDS -New Delhi are acquaint about online thesaurus, while the minimal awareness is noted among the researchers (8.33%) of Jammu University. The awareness level among research scholars of different institutions vary considerably, which is clear from $X^2=72.403$ and **P-Value = 0.000**.

“Biographical source” is the fourth well known reference source among the researchers (30.74%). The source is best known to researchers (51.66%) of Jamia Millia Islamia. The research scholars of IIM – Jammu and I G I B-Delhi are not aware with online biographical sources. $X^2=80.334$ and **P-Value = 0.000** reveals a sizeable variation among research scholars of various institutions about its awareness.

Research scholars (22.40%) are aware about “Online Maps” and majority of them (43.33%) belongs to Jammu University and Jamia Millia Islamia and others are associated with AIIMS and CWDS – Delhi (10%). Besides, scholars of I G I B-Delhi and NIMR-Delhi are not aware with the source. $X^2=62.714$ and **P-Value = 0.000** reveals significant variation among the research scholars of various institutions about their awareness.

“Handbooks and Manuals” are the less known online resources among the scholars (8.70%). $X^2=21.301$ and **P-Value = 0.094** reveals that there is

no variation among researchers of various institutions about their awareness. **Parameshwar and Patil (2009)** report overall 22.90% users are aware and exploit various online reference sources. It is clear that a reasonable awareness of online reference sources exist among the researchers across all the institutions. But to make them more helpful frequent orientation courses need to be organised at the institution, state and national level. This is more relevant when UGC under INFONET programme is spending millions for subscription of online resources. The subscription should be complemented by educating and motivating researchers and student for maximum exploitation of the resources. Table 4.3.5 presents a comprehensive picture.

Table 4.3.5: Awareness about Different Types of Online References Sources among Scholars

Type of Online References Source	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM – Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Encyclopaedias	60 (100)	60 (100)	60 (100)	20 (100)	20 (100)	20 (100)	60 (100)	60 (100)	60 (100)	20 (100)	20 (100)	20 (100)	20 (100)	20 (100)	20 (100)	540 (100)
Dictionaries	53 (88.33)	49 (81.66)	46 (76.66)	17 (85.00)	20 (100)	20 (100)	54 (90.00)	48 (80.00)	51 (85.00)	16 (80.00)	19 (95.00)	20 (100)	16 (80.00)	14 (70.00)	15 (75.00)	458 (84.81)
Biographical sources	23 (38.33)	31 (51.66)	17 (28.33)	1 (5.00)	3 (15.00)	---	27 (45.00)	11 (18.33)	31 (51.66)	3 (15.00)	---	3 (15.00)	1 (5.00)	11 (55.00)	4 (20.00)	166 (30.74)
Thesaurus	8 (13.33)	5 (8.33)	11 (18.33)	5 (25.00)	7 (35.00)	11 (55.00)	23 (38.33)	26 (43.33)	21 (35.00)	13 (65.00)	11 (55.00)	14 (70.00)	12 (60.00)	7 (35.00)	9 (45.00)	183 (33.88)
Maps	19 (31.66)	26 (43.33)	4 (6.66)	7 (35.00)	5 (25.00)	3 (15.00)	12 (20.00)	9 (15.00)	26 (43.33)	2 (10.00)	---	3 (15.00)	---	2 (10.00)	3 (15.00)	121 (22.40)
Handbooks and Manuals	3 (5.00)	6 (10.00)	9 (15.00)	---	4 (20.00)	2 (10.00)	8 (13.33)	3 (5.00)	2 (3.33)	1 (5.00)	---	1 (5.00)	1 (5.00)	3 (15.00)	4 (20.00)	47 (8.70)

Figures in parenthesis indicate percentage

4.3.6 Awareness about Online Repositories

Online repositories have changed the way of storage and dissemination of information for future and are becoming popular especially among researchers. “Subject repositories” are much known among research scholars (73.33%). All scholars (100%) of AIIMS, I G I B-Delhi and NIMR- Delhi are aware about them, while much less awareness is among research scholars of CWDS – Delhi (45%). It varies considerably among the researchers of different institutions as reflected from $X^2=64.602$ and **P-Value = 0.000**. Familiarity of “Institutional repositories” (58.70%) among research scholars is quite good and rank second in popularity. Scholars of AIIMS have cent per-cent awareness of institutional repositories, while less is noted among the scholars (30%) associated with Kashmir University. A considerable variation among research scholars regarding the awareness of institutional repositories is clear from $X^2=65.832$ and **P-Value = 0.000**. Watson (2007) report 57% researchers and teachers are informed with institutional repositories.

“Aggregator repositories” are carving their niche and 7.59% of scholars are aware with them. There acquaintance is seen among researchers (35%) of AIIMS while no understanding is found among the researchers of Kashmir University, IIM – Jammu, Jamia Hamdard and CWDS – Delhi. Once again the awareness level varies among researchers of various institutions about them which estimates as $X^2=60.390$ and **P-Value = 0.000**. “Governmental repositories” are not known among the researcher and mere 3.33% of scholars have their knowledge. $X^2=31.034$ and **P-Value = 0.003** reveals a considerable variation among the scholars of various institutions regarding their awareness. Table 4.3.6 offers a clear picture.

Table 4.3.6: Awareness about Different Types of Online Repositories

Type of Online Repository	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Institutional	18 (30.00)	23 (38.33)	33 (55.00)	11 (55.00)	14 (70.00)	17 (85.00)	41 (68.33)	32 (53.33)	36 (60.00)	20 (100)	17 (85.00)	14 (70.00)	16 (80.00)	13 (65.00)	12 (60.00)	317 (58.70)
Subject	44 (73.33)	31 (51.66)	37 (61.66)	16 (80.00)	18 (90.00)	11 (55.00)	47 (78.33)	39 (65.00)	49 (81.66)	20 (100)	20 (100)	18 (90.00)	20 (100)	9 (45.00)	17 (85.00)	396 (73.33)
Governmental	2 (3.33)	1 (1.66)	---	---	---	---	3 (5.00)	---	2 (3.33)	3 (15.00)	2 (10.00)	---	2 (10.00)	3 (15.00)	---	18 (3.33)
Aggregators	---	4 (6.66)	1 (1.66)	3 (15.00)	5 (25.00)	---	9 (15.00)	---	2 (3.33)	7 (35.00)	3 (15.00)	2 (10.00)	4 (20.00)	---	1 (5.00)	41 (7.59)

Figures in parenthesis indicate percentage

4.4 WEB RESOURCES: USE

4.4.1 Internet Use among Scholars

Different use patterns of internet among researchers exist and the present investigation has found the most popular use of internet among scholars is for “Research” (100%).

The other well-known use is for “Communication with Peers” (63.88%). All the research scholars (100%) from AIIMS do use internet to communicate with experts, supervisors and other professional authorities and small proportion of scholars belong to Jammu University (30%). Accordingly, the use of internet for “communication with peers” varies considerably in different institutions which is evident from $X^2=90.157$ and **P-Value = 0.000**.

The third popular use of internet among scholars is for “News” (45.55%), with majority (63.33%) from Jammu University and small number (18.33%) being associated with Jamia Hamdard. The use of internet for “News” among research scholars of different institutions varies considerably, which is evident from $X^2=55.910$ and **P-Value = 0.000**. However, **Madhusudhan (2007)** has found 20% scholars use web for browsing the “News”, perhaps due to limited domain of investigation.

The use of internet for “Recreation” is also popular (37.03%). The majority (58.33%) from JNU use it. While scholars of NISTDS -New Delhi do not access it for the purpose. It varies significantly among the scholars of different institutions as is clear from $X^2=58.982$ and **P-Value = 0.000**. **Mohammad Nasir Uddin (2003)** establishes that around 18% users browse web for recreational activities. The difference could be attributed to nature of the population which are faculty members in his study.

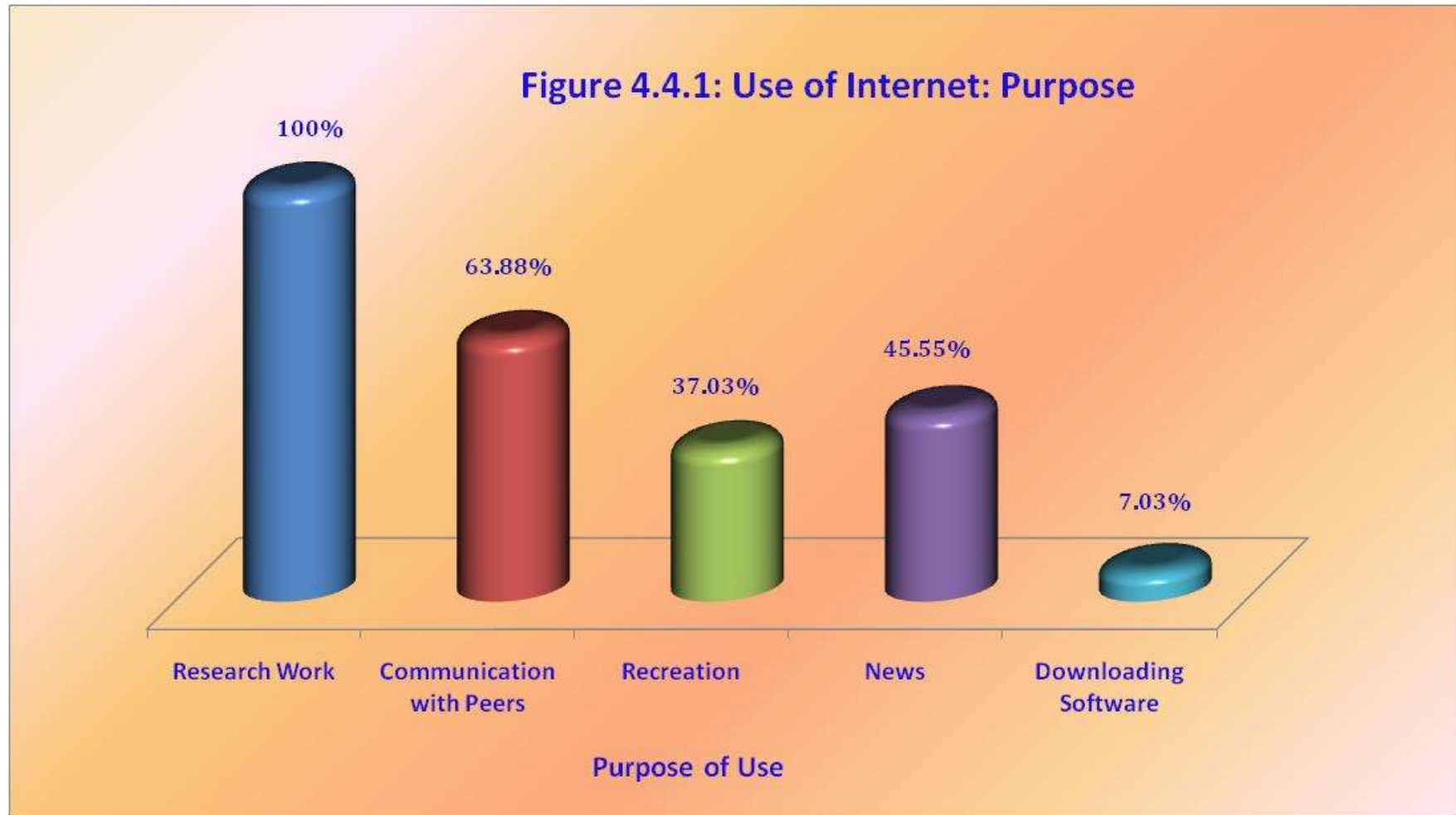
“Downloading Software” is not a concern among researchers (7.03%). The estimates of $X^2=60.522$ and **P-Value = 0.000** supports the view having substantial variation among the researchers of different institutions.

The findings show that research community use internet more to satisfy their research work than any other secondary use. Table 4.4.1 & Figure 4.4.1 offers a detailed account.

Table 4.4.1:Use of Internet: Purpose

Purpose of Use	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM – Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Research Work	60 (100)	60 (100)	60 (100)	20 (100)	20 (100)	20 (100)	60 (100)	60 (100)	60 (100)	20 (100)	20 (100)	20 (100)	20 (100)	20 (100)	20 (100)	540 (100)
Communication with Peers	24 (40.00)	18 (30.00)	43 (71.66)	11 (55.00)	17 (85.00)	19 (95.00)	41 (68.33)	32 (53.33)	43 (71.66)	20 (100)	17 (85.00)	14 (70.00)	18 (90.00)	11 (55.00)	17 (85.00)	345 (63.88)
Recreation	32 (53.33)	27 (45.00)	19 (31.66)	8 (40.00)	3 (15.00)	5 (25.00)	35 (58.33)	24 (40.00)	27 (45.00)	4 (40.00)	3 (15.00)	---	3 (15.00)	3 (15.00)	7 (35.00)	200 (37.03)
News	38 (63.33)	42 (70.00)	26 (43.33)	11 (55.00)	4 (40.00)	9 (45.00)	26 (43.33)	11 (18.33)	31 (51.66)	7 (35.00)	5 (35.00)	8 (40.00)	10 (50.00)	12 (60.00)	6 (30.00)	246 (45.55)
Downloading Software	7 (11.66)	13 (21.66)	---	3 (15.00)	---	---	12 (30.00)	3 (5.00)	---	---	---	---	---	---	---	38 (7.03)

Figures in parenthesis indicate percentage



4.4.2 Use

A majority of scholars are aware about different kinds of web resources and an attempt was made to measure their use. The study found that all research scholars (100%) use “online journals” for research. However, **Al-Ansari (2006)** found marginally less users of online journals (88.05%), perhaps the study being focused on faculty members only and are not exposed to new emerging resource formats. “e-books” turns the second most exploited web resource (69.62%). All the researchers (100%) of CWDS – Delhi use “e-books”, whereas lowest use is made by scholars (50%) of NIMR-Delhi. Though the use of “e-books” is quite high among scholars of all the institutions yet estimates of $X^2=34.170$ and $P\text{-Value} = 0.002$ show considerable variation in use among researchers of different institutions. **Rajeev Kumar and Amritpal Kaur (2005)** identify 46.4% use “e-books”. The lower use in the study could be attributed to the increased popularity for last three years and more and more “e-books” both free and fee based are coming up every now and then.

“Databases” rank third in usability among researchers (63.70%). The optimum use is made by the scholars (85%) of CWDS – Delhi and minimal by the scholars (45%) of NISTDS -New Delhi. “Databases” use among the researchers of different institutions shows ($X^2=28.512$ and $P\text{-Value} = 0.012$) a significant variation. **Rajeev Kumar and Amritpal Kaur (2005)** report that around 33.5% respondents are utilising “databases”, which amount to almost the half of what is being utilised now. The escalated use may be due to the fact that present study focuses on researchers who have better understanding of “databases” besides being more useful in research compared to undergraduate students, studied by Kumar & Kaur.

“ETD’s” are also turning popular resources among researchers (63.14%). The optimum use of ETD’s is seen among research scholars of Jamia Hamdard (81.66%), and minimum by scholars (40%) of SKIMS. $X^2=39.741$ and $P\text{-Value} = 0.000$ shows a considerable variation among the scholars of different institutions.

“Blogs” are also exploited by scholars quite well as whopping 51.11% scholars use the resource with optimum use made by the scholars (100%) of CWDS - Delhi, whereas minuscule proportion of scholars (21.66%) from SKUAST-K exploit it. The use of “blogs” among research scholars of different institutions varies significantly as indicated by $X^2=73.236$ and **P-Value = 0.000**.

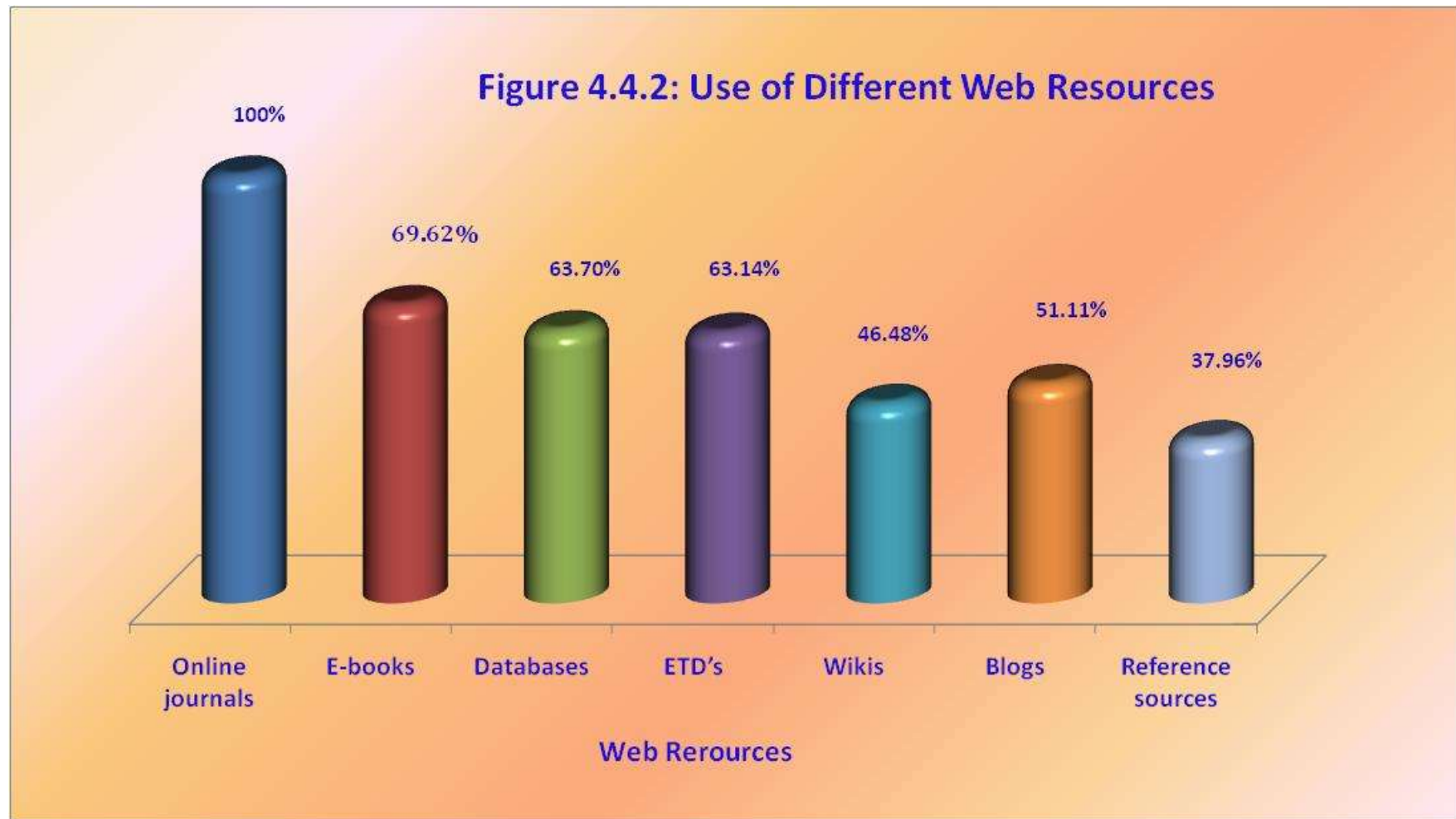
“Wikis” are revolutionary web resources simultaneously exploited and improved by users and is one of the best upcoming models of knowledge sharing. The study found overall 46.48% exploit “wikis”. The maximum use is made by scholars (90%) of CWDS – Delhi, while minimum use by scholars (25%) of SKIMS. “Wikis” use among different institutions show a significant variation as estimated from $X^2=34.765$ and **P-Value = 0.002**.

“Reference sources” are also popular used by good number of researchers (37.96%) with optimum use made by researchers (60%) of NISTDS -New Delhi and CWDS – Delhi, while lower by scholars (23.33%) of Jammu University and Jamia Hamdard. The use of “reference sources” as evident by $X^2=27.285$ and **P-Value = 0.018** varies significantly among the scholars of different institutions. **Vakkari (2005)** found that 28% respondents utilise reference sources every now and then. The slight difference in use over 3 years period is expected. The tremendous popularity of web resources among scholars shows the impact it has on research activities and can grow in coming years with more sophistication and user friendly access methods. Table 4.4.2 & Figure 4.4.2 presents a comprehensive picture.

Table4.4.2: Use of Different Web Resources

Type of Web Resource	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Online journals	60 (100)	60 (100)	60 (100)	20 (100)	20 (100)	20 (100)	60 (100)	60 (100)	60 (100)	20 (100)	20 (100)	20 (100)	20 (100)	20 (100)	20 (100)	540 (100)
E-books	47 (78.33)	39 (65.00)	36 (60.00)	10 (50.00)	12 (60.00)	16 (80.00)	51 (85.00)	42 (70.00)	37 (61.33)	13 (65.00)	15 (75.00)	12 (60.00)	10 (10.00)	20 (100)	16 (80.00)	376 (69.62)
Databases	29 (48.33)	31 (51.66)	43 (71.66)	14 (70.00)	13 (65.00)	15 (75.00)	39 (65.00)	41 (68.33)	41 (68.33)	18 (90.00)	11 (55.00)	9 (45.00)	12 (60.00)	17 (85.00)	11 (55.00)	344 (63.70)
ETD's	37 (61.33)	30 (50.00)	28 (46.66)	10 (50.00)	8 (40.00)	11 (55.00)	47 (78.33)	49 (81.66)	37 (61.33)	15 (75.00)	12 (60.00)	16 (80.00)	15 (75.00)	11 (55.00)	15 (75.00)	341 (63.14)
Wikis	24 (40.00)	27 (45.00)	19 (31.66)	7 (35.00)	5 (25.00)	7 (35.00)	35 (58.33)	29 (48.33)	34 (56.66)	9 (45.00)	11 (55.00)	10 (50.00)	8 (40.00)	18 (90.00)	8 (40.00)	251 (46.48)
Blogs	21 (35.00)	25 (41.66)	13 (21.66)	9 (45.00)	9 (45.00)	14 (70.00)	41 (68.33)	33 (55.00)	25 (41.66)	16 (80.00)	13 (65.00)	14 (70.00)	11 (55.00)	20 (100)	12 (60.00)	276 (51.11)
Reference sources	26 (43.33)	14 (23.33)	23 (38.33)	11 (55.00)	7 (35.00)	5 (25.00)	26 (43.33)	14 (23.33)	22 (36.66)	7 (35.00)	8 (40.00)	12 (60.00)	11 (55.00)	12 (60.00)	7 (35.00)	205 (37.96)

Figures in parenthesis indicate percentage



4.4.3 Use: Time Span Perspective

A sizeable group of scholars (38.51%) are using web resources for more than two years. Among them researchers (51.66%) from SKUAST-K form a major chunk whereas minimum belongs to NIT, Srinagar (20%). The estimates $X^2=14.190$ and $P\text{-Value} = 0.436$ indicate no considerable variation among the researchers of different institutions in their experience of using web. However, **Rajeev Kumar and Amritpal Kaur (2005)** established that 64.60% engineering graduates are using web resources for more than two years. This variation in findings could be due to the fact that current study encompasses researchers from many disciplines, and such personal inhibition to use web resources may be a factor.

Scholars are also using the web resources for more than one year (29.81%). The most of scholars (45%) in this slot come from I G I B-Delhi, 15% belong to NISTDS -New Delhi. The chi square test ($X^2=21.257$ and $P\text{-Value} = 0.095$) confirm approximately similar number of scholars among all the institutions use web for the period. **Rajeev Kumar and Amritpal Kaur (2005)** report 21.3% engineering graduates are using web resources for more than one year but less than two years. Around 23.70% of scholars are using web resources for more than 6 month and the majority of scholars (35%) in this category belong to NISTDS -New Delhi, while 15% are from Kashmir University. But overall equal proportion of scholars use web in various institutions for more than 6 months is indicated by $X^2=8.990$ and $P\text{-Value} = 0.832$.

A small number of research scholars (10.74%) use the web resources for less than six months and majority of scholars (21.66%) in this slot are from SKUAST-K, whereas from IIIM – Jammu, AIIMS, I G I B-Delhi and NIMR-Delhi do not fall in this category. The variation among the scholars of different institutions is confirmed from estimates of $X^2=36.894$ and $P\text{-Value} = 0.001$.

Two third of scholars use web resources for more than one year clearly indicate the impact on user community. Secondly, it shows that most of the researcher are not novice about the web and have better understanding of its pros and cons. Table 4.4.3 presents a comprehensive picture

Table 4.4.3: Web Resources Use: Time Span Perspective

Time Span	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM – Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Less than 6 month	5 (8.33)	9 (15.00)	13 (21.66)	7 (35.00)	3 (15.00)	---	8 (13.33)	5 (8.33)	3 (5.00)	---	---	2 (10.00)	---	3 (15.00)	---	58 (10.74)
6 months to One year	9 (15.00)	11 (18.33)	17 (28.33)	5 (25.00)	5 (25.00)	6 (30.00)	14 (23.33)	11 (18.33)	18 (30.00)	6 (30.00)	5 (25.00)	7 (35.00)	5 (25.00)	4 (20.00)	5 (25.00)	128 (23.70)
One to Two years	22 (36.66)	19 (31.66)	9 (15.00)	4 (20.00)	7 (35.00)	4 (20.00)	21 (35.00)	23 (38.33)	12 (20.00)	8 (40.00)	9 (45.00)	3 (15.00)	7 (35.00)	6 (30.00)	7 (35.00)	161 (29.81)
More than two year	24 (40.00)	21 (35.00)	31 (51.66)	4 (20.00)	8 (40.00)	10 (50.00)	17 (28.33)	21 (35.00)	27 (45.00)	6 (30.00)	6 (30.00)	8 (40.00)	8 (40.00)	7 (35.00)	8 (40.00)	208 (38.51)

Figures in parenthesis indicate percentage

4.4.4 Use in Research

The web resources have tremendous impact on teaching and research especially during last decade. However, 48.88% scholars show equal preference to both print and web resources. The optimum use of both print & web resources is made by scholars (65%) of I G I B-Delhi, and marginal by scholars (40%) of NISTDS -New Delhi and NIMR-Delhi. The estimates of $X^2=6.537$ and **P-Value = 0.951** support the view showing no considerable variation among research scholars of various institutions about use of print & web resources. **Liew et al (2000)** found that 73.5% graduate students use web resources compared to traditional sources of information.

However, 32.03% scholars make use of web resources as a main source of information for their research. It is mainly used by the researchers (55%) of CWDS – Delhi and only 15% of scholars of JNU. No significant variation is observed from $X^2=21.705$ and **P-Value = 0.085** among scholars of different institutions about it. **Brown et al (2006)** find that 51.68% use web resources as main source of information, which could be attributed to better awareness and IT know-how among the scholars based in United Kingdom.

A growing trend among the scholars is sole use of web resources for research. It is found that around 14.07% scholars exclusively rely on web resources. In this category the scholars (23.33%) of JNU leads, while as no scholar from SKIMS, I G I B-Delhi and CWDS – Delhi make exclusive use of web resources. $X^2=19.601$ and **P-Value = 0.143** indicates no considerable difference among scholars of different institutions about it. There are still 5% scholars who make a negligible use of web resources. The majority of such scholars (23.33%) belong to Jammu University and JNU. A considerable variation among scholars of different institutions exist which is evident from $X^2=39.298$ and **P-Value = 0.000**.

The use of web resources in research is quite remarkable although having emerged recently but have not overshadowed the print resources

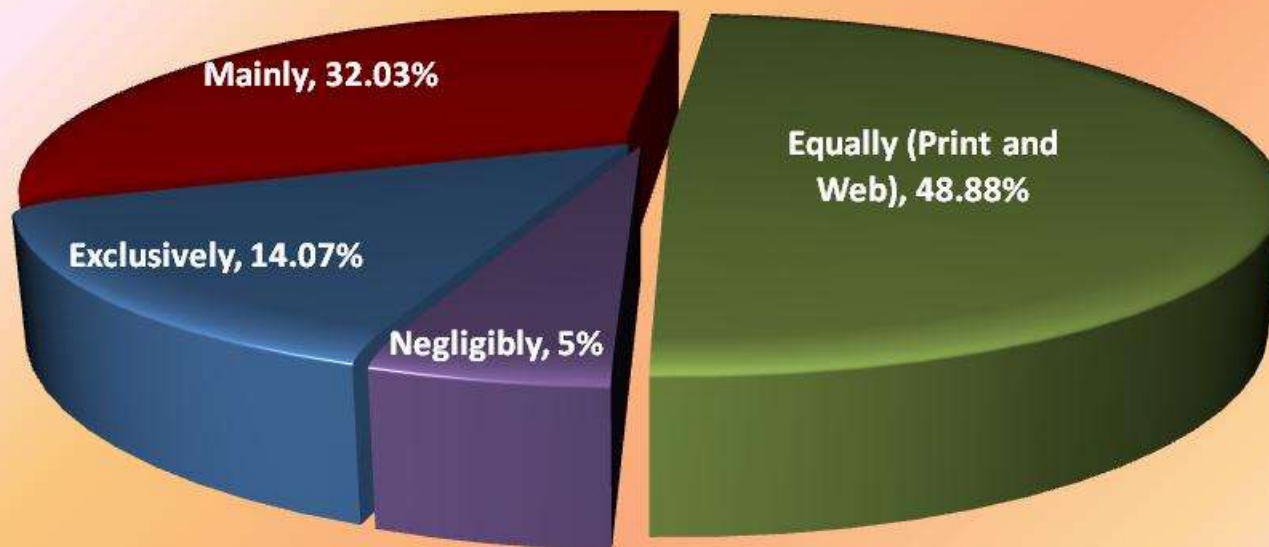
completely. Still a good number of scholars give equal credence to print sources while selecting web resources. This scenario may continue for decades in view of strong roots of print resources among users, particularly researcher community, besides huge treasures of knowledge are still available in printed format. Table 4.4.4 & Figure 4.4.4 provides a complete insight

Table 4.4.4: Web Resources Use in Research

Degree of Web Resources Use	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM – Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Exclusively	5 (8.33)	12 (20.00)	9 (15.00)	3 (15.00)	---	2 (10.00)	14 (23.33)	7 (11.66)	11 (18.33)	3 (15.00)	---	4 (20.00)	3 (15.00)	---	3 (15.00)	76 (14.07)
Mainly	22 (36.66)	15 (25.00)	19 (31.66)	7 (35.00)	9 (45.00)	7 (35.00)	9 (15.00)	21 (35.00)	14 (23.33)	8 (40.00)	7 (35.00)	8 (40.00)	9 (45.00)	11 (55.00)	7 (35.00)	173 (32.03)
Equally (Print and Web)	29 (48.33)	25 (41.66)	32 (53.33)	10 (50.00)	11 (55.00)	11 (55.00)	29 (48.33)	32 (53.33)	28 (46.66)	9 (45.00)	13 (65.00)	8 (40.00)	8 (40.00)	9 (45.00)	10 (50.00)	264 (48.88)
Negligibly	4 (6.66)	8 (23.33)	---	---	---	---	8 (13.33)	---	7 (11.66)	---	---	---	---	---	---	27 (5.00)

Figures in parenthesis indicate percentage

Figure 4.4.4: Web Resources Use in Research



4.5 DEGREE OF SATISFACTION

4.5.1 Content Richness

The web resources are termed “more comprehensive and rich source of information than traditional resources” by majority of research scholars (82.96%). All associated with NISTDS -New Delhi and NIMR-Delhi make this observation, except 60% from CWDS – Delhi. But $X^2=26.832$ and **P-Value = 0.020** mark a considerable variation among the scholars of different institutions about it. Madhusudhan (2007) reports 69% users agree with the view. A few scholars (16.04%) consider “contents of web resource similar to traditional ones”; mainly from CWDS – Delhi (40%). The scholars of NISTDS -New Delhi and NIMR-Delhi do not agree with this observation. These researchers show slight variation about the perception which is obvious from $X^2=26.832$ and **P-Value = 0.020**. Thus, scholars endorse the widely perceived view that “web resources are more comprehensive than traditional resources”. Table 4.5.1 gives a detailed account of facts and figures.

Table 4.5.1:Comprehensiveness of Web Resources

Comprehensiveness	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
More Comprehensive and rich than Traditional resources	49 (81.66)	53 (88.33)	44 (73.33)	17 (85.00)	15 (75.00)	18 (90.00)	48 (80.00)	54 (90.00)	49 (81.66)	18 (90.00)	16 (80.00)	20 (100)	20 (100)	12 (60.00)	15 (75.00)	448 (82.96)
Similar to Traditional resources	11 (18.33)	7 (11.66)	16 (26.66)	3 (15.00)	5 (25.00)	2 (10.00)	12 (20.00)	6 (10.00)	11 (18.33)	2 (10.00)	4 (20.00)	---	---	8 (40.00)	5 (25.00)	92 (16.04)
Less Comprehensive than Traditional	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Can't Comment	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Figures in parenthesis indicate percentage

4.5.2 Updateness

The majority of scholars (94.07%) believe web resources are more “frequently updated than traditional ones”. But this view is not quite consistent among research scholars of different institutions as indicated from $\chi^2=28.767$ and **P-Value = 0.011**. A small minority of scholars (5.93%) observe that web resources are “updated similar to as traditional resources”, and most scholars (20%) with this perception belong to CWDS – Delhi, whereas scholars of SKUAST-K, NIT- Srinagar, SKIMS, IIM – Jammu, AIIMS, NISTDS -New Delhi and NIMR-Delhi do not agree with this perception. $\chi^2=28.767$ and **P-Value = 0.011** shows a significant variation in perception among researchers of different intuitions. However, **Al-Ansari (2006)** reveal 73.4% users believe that the information available by web resources is “more up-to-date than traditional resources”. Thus, the frequent and quick updation of web resources is one of the main reasons of success over traditional resources, appreciated and liked by the users all over the world. Table 4.5.2 presents detailed pictures.

Table 4.5.2: Frequency Updateness of Web Resources: User Response

Degree of Frequency	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Frequently Updated than traditional Resources	57 (95.00)	54 (90.00)	60 (100)	20 (100)	18 (90.00)	20 (20.00)	56 (93.33)	53 (88.33)	59 (98.33)	20 (100)	17 (85.00)	20 (100)	20 (100)	16 (80.00)	18 (90.00)	508 (94.07)
Similar to as traditional Resources	3 (5.00)	6 (10.00)	---	---	2 (10.00)	---	4 (6.66)	7 (11.66)	1 (1.66)	---	3 (15.00)	---	---	4 (20.00)	2 (10.00)	32 (5.93)
Seldom Updated than Traditional	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Can't Comment	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Figures in parenthesis indicate percentage

4.5.3 Features

The web resources have many features which make them unique and prominent from other media. The “timeliness” of web resources is being considered the most impressive feature of the web resources by around 85.74% scholars from all the institutions. The most scholars (95%) of NIMR-Delhi and IEG - Delhi observe “timeliness” most effective feature, while few scholars from SKUAST-K (78.33%) agree with this. Much variation among the research scholars of different intuitions regarding appreciation of “timeliness” of web resources is not evident from $X^2=8.482$ and **P-Value = 0.863**. **Jange et al (2006)** has conducted a study of research scholars and faculty of National Institutes of Technology found 60% respondents consider “timeliness” of web resources an important feature. The study was confined to Engineering colleges reflecting the views of a homogenous group, while as present study draws inferences from different disciplines.

Secondly, the scholars (82.59%) highly appreciate the “easy accessibility” feature. Mainly scholars of Jamia Hamdard, AIIMS, NISTDS -New Delhi, NIMR-Delhi and CWDS – Delhi (90%) observe it a very impressive feature. $X^2=20.892$ and **P-Value = 0.104** supports the view and no significant variation is observed in perception of research scholars of various institutions. Again, findings of **Jange et al (2006)** are marginally varying with the present findings and according to them around 44% scholars and faculty agree that accessibility of web resources is quite helpful for users.

“Usefulness” is another popular feature of web resources. It is rated as one of the most valuable feature (81.29%). The majority of such scholars belong to SKIMS and IIM – Jammu (90%), while no considerable variation in perception is indicated from $X^2=6.747$ and **P-Value = 0.944** among the scholars of different institutions about it. The findings of **Jange et al (2006)** show 58.9% scholars and faculty members give credence to the usefulness feature.

The unique feature of web resources being “all time availability” to one and all is appreciated by the 72.59% scholars. The optimum number of such scholars (85%) belong to I G I B-Delhi, whereas the minimum researchers (55%) are associated with Jammu University. This feature of web resources among the

researchers of different institutions does not show any significant variation which is evident from $X^2=16.102$ and **P-Value = 0.307**.

The “Accuracy” of some of web resources is still a debatable issue in the backdrop that every user is a publisher as well and no organised central evaluation body exist to rate correctness or otherwise of web resources, yet a great number of scholars (71.11%) consider web resources accurate. Mainly such scholars are from AIIMS (90%) and the minimum associated with JNU (51.66%). A significant variation in perception is indicated from $X^2=29.531$ and **P-Value = 0.009** among the scholars of different institutions about it.

The sixth feature of web resources among scholars (62.59%) is “Ease of Use”. The optimal proportion of scholars (80%) with this opinion belongs to AIIMS and I G I B-Delhi and minimum to CWDS – Delhi (45%). $X^2=30.766$ and **P-Value = 0.006** reveals a considerable variation among the scholars of different institutions regarding it. “Uniqueness” is also observed as one of the important feature of web resources and around 57.77% scholars suggest it. Most scholars (71.66%) with this perception belong to JNU and least come from Kashmir University (38.33%). $X^2=20.906$ and **P-Value = 0.104** supports the view that not much variation exist among research scholars of different institutions regarding appreciation of “Uniqueness” of web resource. Once again **Jange et al (2006)** finds level of satisfaction among scholars and faculty of NITs slightly lower (44.4%) than mixed population of present study.

The “permanence” of web resource is a concern among the scholars and 46.11% scholars believe that web resources have degree of “permanence”. Scholars (61.66%) that consider them having certain degree of permanence are from JNU but the minimum satisfaction with the feature is reflected by research scholars (28.33%) of Kashmir University. A significant variation in perception as is indicated from $X^2=24.012$ and **P-Value=0.04** among the scholars of different institutions about it. Table 4.5.3 presents comprehensive picture.

Table 4.5.3: Web Features: User Response

Features	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Accessibility	49 (81.66)	43 (71.66)	52 (86.66)	16 (80.00)	18 (90.00)	16 (80.00)	51 (85.00)	54 (90.00)	41 (68.33)	18 (90.00)	17 (85.00)	18 (90.00)	18 (90.00)	18 (90.00)	17 (85.00)	446 (82.59)
Accuracy	35 (58.33)	40 (66.66)	45 (75.00)	14 (70.00)	17 (85.00)	15 (75.00)	31 (51.66)	41 (68.33)	47 (78.33)	18 (90.00)	16 (80.00)	17 (85.00)	16 (80.00)	15 (75.00)	17 (85.00)	384 (71.11)
Availability	41 (68.33)	33 (55.00)	46 (76.66)	16 (80.00)	16 (80.00)	15 (75.00)	43 (71.66)	48 (80.00)	44 (73.33)	16 (80.00)	17 (85.00)	15 (75.00)	13 (65.00)	15 (75.00)	14 (70.00)	392 (72.59)
Ease of Use	34 (56.66)	28 (46.66)	37 (61.66)	15 (75.00)	15 (75.00)	14 (70.00)	33 (55.00)	45 (75.00)	31 (51.66)	16 (80.00)	16 (80.00)	15 (75.00)	15 (75.00)	9 (45.00)	15 (75.00)	338 (62.59)
Timeliness	52 (86.66)	50 (83.33)	47 (78.33)	17 (85.00)	17 (85.00)	17 (85.00)	54 (90.00)	49 (81.66)	51 (85.00)	18 (90.00)	18 (90.00)	18 (90.00)	19 (95.00)	17 (85.00)	19 (95.00)	463 (85.74)
Uniqueness	23 (38.33)	35 (58.33)	39 (65.00)	9 (45.00)	11 (55.00)	12 (60.00)	43 (71.66)	37 (61.66)	33 (55.00)	12 (60.00)	12 (60.00)	10 (50.00)	13 (65.00)	9 (45.00)	14 (70.00)	312 (57.77)
Usefulness	47 (78.33)	51 (85.00)	49 (81.66)	17 (85.00)	18 (90.00)	18 (90.00)	46 (76.66)	51 (85.00)	46 (76.66)	15 (75.00)	16 (80.00)	16 (80.00)	17 (85.00)	15 (75.00)	17 (85.00)	439 (81.29)
Permanence	17 (28.33)	24 (40.00)	31 (51.66)	7 (35.00)	12 (60.00)	12 (60.00)	37 (61.66)	22 (36.66)	29 (48.33)	11 (55.00)	10 (50.00)	7 (35.00)	11 (55.00)	10 (50.00)	9 (45.00)	249 (46.11)

Figures in parenthesis indicate percentage

4.5.4 Hindrances in Access

Although web has emerged as a blessing for users but some concerns need to be sorted out in future. The research scholars observe the biggest concern in accessing web resources is that “too much information is retrieved” and this is expressed by majority of scholars (69.81%). Mainly such concern is expressed from scholars (90%) of SKIMS and AIIMS, while less concern on this count is shown by the scholars of CWDS – Delhi (55%). $X^2=28.067$ and **P-Value=0.014** reveal a significant variation among research scholars of different institutions about it. **Mohammad Nazim (2008)** reports that 40.25% scholars feel that too much information is retrieved from the web.

The second hurdle faced by research scholars (66.29%) is “difficulty in finding the relevant information”. The most scholars with this belief are from NIT, Srinagar (70%), and least from Kashmir University and Jamia Millia Islamia (38.33%). No significant variation is evident from $X^2=13.059$ and **P-Value = 0.522** estimates about the “difficulty in finding the relevant information”. **Rajeev Kumar and Amritpal Kaur (2005)** has identified about 21.3% users who believe that it is difficult to find relevant information on web. The difference in findings could be attributed to the fact that the findings of Kumar and Kaur are confined to engineering colleges students and teachers as such use of better search strategy is not beyond imagination.

“Slow access speed” to web resources is also a concern among scholars (38.14%) who consider it third hurdle in smooth access. The most scholars (65%) with this observation belong to SKUAST-K and the least scholars (16.66%) are associated with JNU. $X^2=46.682$ and **P-Value = 0.000** estimates reveal a substantial variation among the scholars of different institutions about “Slow access speed” of web resources. Likewise, a study by **Kaushik and Singh (n.p)** found 30% scholars are not satisfied with speed of access which is nearer to estimates of the present study.

The subsequent biggest problem research scholars confront is the lack of IT skills to effectively utilize the services. This limitation on part of the researchers limits their ability to exploit the web resources to optimum. It is found that around 37.03% scholars consider it a second big hindrance in best

utilization of web resources with highest number of scholars (70%) belonging to SKIMS and the least associated with NIT, Srinagar(20%). A significant variation in perception is indicated from $X^2=33.131$ and **P-Value = 0.003** among the scholars of different institutions about it. **Hinson and Amidu (2006)** reveal 47% lack of IT skills which is slightly higher than present study and could be understood in light of the fact that study of Hinson and Amidu conducted their study in Africa where the IT knowledge is fairly lower than India.

The “limited access to internet” is believed to be a barrier by the research scholars (30.55%). The optimum scholars (55%) with this observation hail from SKUAST-K and NIT-Srinagar, while minuscule number belongs to JNU(8.33%). $X^2=57.234$ and **P-Value = 0.000** indicate a considerable variation among scholars of different institutions about the problem. **Hanson and Carlson (2005)** found around 11.3% graduate students feel limited Internet access a barrier which is lower than the present finding. The variation could be attributed to the fact that the study was conducted in US where limited access is not an issue considering their leadership in IT and internet facilities throughout that country.

A good number of research scholars (25%) do consider web as “time consuming”. Most scholars (45%) with the belief are from AIIMS and IGI B-Delhi, while scholars of IIM – Jammu does not consider it a hindrance. $X^2=69.187$ and **P-Value = 0.000** shows a considerable variation among the scholars of different institutions about this aspect of the web.

“Technical intricacies” are also reported barrier in smooth access to web resources by around 19.44% scholars. Most of the scholars (35%) with this view come from SKIMS, however no scholar of NISTDS -New Delhi perceives this as a hindrance. The observations of researchers of different institutions vary on this substantially, as is evident from $X^2=27.239$ and **P-Value = 0.018**.

Small number of scholars (17.77%) complain about reading on a computer screen as a difficulty in smooth access of web resources. The majority of such scholars are of SKUAST-K, whereas no scholar of IIM – Jammu, NISTDS - New Delhi and CWDS – Delhi consider it so. $X^2=73.429$ and **P-Value =**

0.000deciphers a significant variation among scholars of different institutions aboutthe difficulty.

These hindrances may not last long with the improvement of technology and development of facilities in coming years. Technologies like semantic web will make our retrieval more precise and thus will save the time, besides slow access to internet may be taken care by the wider use of high speed broadband rapidly. Table 4.5.4 gives a detailed account of fact and figures.

Table 4.5.4: Concerns in Accessing Web Resources: User Response

Hindrances in Access	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Too much information is retrieved	52 (86.66)	44 (73.33)	39 (65.00)	17 (85.00)	18 (90.00)	13 (65.00)	37 (61.66)	41 (68.33)	36 (60.00)	18 (90.00)	12 (60.00)	14 (70.00)	12 (60.00)	11 (55.00)	13 (65.00)	377 (69.81)
Time consuming	7 (11.66)	17 (28.33)	21 (35.00)	7 (35.00)	2 (10.00)	---	12 (20.00)	16 (26.66)	13 (21.66)	9 (45.00)	9 (45.00)	7 (35.00)	4 (20.00)	6 (30.00)	5 (25.00)	135 (25.00)
Lack of IT Knowledge to effectively utilize the services	19 (31.66)	25 (41.66)	33 (55.00)	4 (20.00)	14 (70.00)	5 (25.00)	21 (35.00)	18 (30.00)	16 (26.66)	12 (60.00)	7 (35.00)	5 (25.00)	6 (30.00)	7 (35.00)	8 (40.00)	200 (37.03)

Table 4.5.4 Contd.

Limited access to internet	24 (40.00)	27 (45.00)	33 (55.00)	11 (55.00)	9 (45.00)	8 (40.00)	5 (8.33)	11 (18.33)	22 (36.66)	4 (20.00)	3 (15.00)	4 (20.00)	5 (25.00)	6 (30.00)	3 (15.00)	165 (30.55)
Slow access speed	33 (55.00)	22 (36.66)	39 (65.00)	10 (50.00)	6 (30.00)	9 (45.00)	10 (16.66)	21 (35.00)	19 (31.66)	5 (25.00)	9 (45.00)	4 (20.00)	7 (35.00)	6 (30.00)	6 (30.00)	206 (38.14)
Difficulty in finding the relevant information	23 (38.33)	31 (51.66)	28 (46.66)	14 (70.00)	9 (45.00)	12 (60.00)	32 (53.33)	27 (45.00)	23 (38.33)	12 (60.00)	10 (50.00)	11 (55.00)	9 (45.00)	8 (40.00)	10 (50.00)	358 (66.29)
Difficult to read from the screen	11 (18.33)	21 (35.00)	27 (45.00)	4 (20.00)	2 (10.00)	---	5 (8.33)	2 (3.33)	9 (15.00)	5 (25.00)	6 (30.00)	---	2 (10.00)	---	2 (10.00)	96 (17.77)
Technical problems	5 (8.33)	11 (18.33)	19 (31.66)	4 (20.00)	7 (35.00)	2 (10.00)	14 (23.33)	9 (15.00)	11 (18.33)	8 (40.00)	4 (20.00)	---	5 (25.00)	3 (15.00)	3 (15.00)	105 (19.44)

Figures in parenthesis indicate percentage

4.5.5 Browsing

Besides umpteen benefit and unique features of web resources, users confront many problems in getting information all the time. On this count data enlightens us that “Internet linkage down” is a biggest problem in accessing favourite resource many times. It is found that 75.74% research scholars encounter this problem. It is further revealed that all the scholars (100%) of AIIMS and NISTDS -New Delhi consider it a major obstacle against 45% scholars of Kashmir University. $X^2=59.161$ and **P-Value = 0.000** shows a considerable variation among the scholars of different institutions about the problem.

“Frequent power break-ups” is second problem reflected by the scholars (37.96%). The majority of scholars (70%) with this opinion are from NIT-Srinagar and I G I B-Delhi, while scholars of AIIMS do not consider it a problem. $X^2=55.592$ and **P-Value = 0.000** shows considerable variation among the scholars of different institutions. However, **Luambano (2004)** found only 5% perceive “frequent power break-ups” as a barrier. This could be understood in view that study was confined to an institution where sufficient facilities might be in place to overcome this barrier. The other limitations like “staff asking to leave early” or “need to reach home earlier” are not being considered a major hurdle as reflected by about 5% scholars. Table 4.5.5 offer a lucid picture of the difficulties in browsing.

Table 4.5.5: Limitations in Browsing Web Resources in various Institutions

Limitations Faced	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM – Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Frequent power break ups	31 (51.66)	27 (45.00)	21 (35.00)	14 (70.00)	7 (35.00)	12 (60.00)	20 (33.33)	26 (43.33)	17 (28.33)	---	14 (70.00)	3 (15.00)	5 (25.00)	3 (15.00)	5 (25.00)	205 (37.96)
Internet linkage down	27 (45.00)	39 (65.00)	46 (76.66)	17 (85.00)	15 (75.00)	17 (85.00)	43 (71.66)	44 (73.33)	51 (85.00)	20 (100)	17 (85.00)	20 (100)	17 (85.00)	18 (90.00)	18 (90.00)	409 (75.74)
Staff asks to leave early	---	---	12 (20.00)	7 (35.00)	---	11 (55.00)	---	---	---	---	---	---	---	---	---	30 (5.55)
To reach home earlier	24 (40.00)	3 (5.00)	---	---	---	---	---	---	---	---	---	---	---	---	---	27 (5.00)

Figures in parenthesis indicate percentage

4.5.6 Web Vs Traditional Resources

Scholars consider web resources more “time saving” than traditional resources (73.14%) with no significant variation among scholars of different institutions ($X^2=16.367$ and $P\text{-Value} = 0.291$). Substantiating present study, **Al-Ansari (2006)** also found 74.8% users feel web resources save time. However, **Liew, Foo and Chennupati, (2000)** established that only 31% respondents consider web resources more time saving than traditional sources of information. This drastic variation in perception could be understood with the argument that their study was conducted in year 2000 when the awareness and know-how of web resources was still a nascent concept and 8 years down the line makes them more popular and easy to handle than earlier considered.

“Easy to Use” feature is believed by 63.88% research scholars a reason to use web resources, while rest of scholars (36.12%) contradict their view. A slight variation among the research scholars of different institutions is indicated from $X^2=24.995$ and $P\text{-Value} = 0.035$. **Rajeev Kumar and Amritpal Kaur (2005)** found a whopping 91.6% users consider web resources easy to use, besides **Liew, Foo and Chennupati, (2000)** who found 48% users believe it so.

Majority of research scholars (65.38%) consider web resources “more informative” than traditional resources, whereas rest of scholars (34.62%) do not agree with this perception. This view is not quite consistent among research scholars of all the institutions as $X^2=27.650$ and $P\text{-Value} = 0.016$ indicate a great variation in it. **Liew, Foo and Chennupati, (2000)** further found that 69% users perceive web resources more informative which are in line with present findings. Besides, scholars (73.14%) also consider web resources “more useful” than traditional ones. But estimates of $X^2=23.325$ and $P = 0.055$ reveal a slight variation among scholars of various institutions about it.

Web resources are more preferred by research scholars (85.38%) over the traditional sources. This is supported from $X^2=10.616$ and $P\text{-Value} =$

0.716 which reveal the perception is common among researchers of all the institutions. Similarly **Liew, Foo and Chennupati, (2000)** found 73.5% respondents (which were under-graduate students) prefer web resources. Besides, a study at the University of Illinois reported that print journal usage and interlibrary loan requests significantly decreased since the introduction of online journals. The decrease in use of the print collection suggest that many patrons prefer to access journals online (**De Groote and Dorsch, 2001**). Thus web resources are more popular and preferred over the other types of resources for their features discussed above. Table 4.5.6 provides a detailed account of facts and figures.

Table 4.5.6: Popularity of Web Resources Vs Traditional Resources

Features	Kashmir University		Jammu University		SKUAST-K		NIT, Srinagar		SKIMS		IIM - Jammu		JNU		Jamia Hamdard		Jamia Millia Islamia		AIIMS		IGIB-Delhi		NISTDS -New Delhi		NIMR-Delhi		CWDS - Delhi		IEG - Delhi		Average	
	n=60		n=60		n=60		n=20		n=20		n=20		n=60		n=60		n=60		n=20		n=20		n=20		n=20		n=20		n=20		n=540	
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		
Time Saving	47	13	42	18	50	10	17	3	14	6	15	5	48	12	42	18	41	19	15	5	13	7	15	5	12	8	14	6	10	10	395 (73.14)	145 (26.86)
Easy to Use	36	24	42	18	38	22	18	2	17	3	18	2	33	27	39	21	35	25	11	9	12	8	9	11	14	6	11	9	12	8	345 (63.88)	195 (36.12)
More Informative	34	26	47	13	43	17	16	4	11	9	13	7	29	31	33	27	42	18	17	3	14	6	12	8	12	8	16	4	14	6	353 (65.38)	187 (34.62)

Table 4.5.6 contd.

More Useful	47	13	34	26	39	21	18	2	14	6	18	2	39	21	46	14	46	14	17	3	17	3	15	5	14	6	16	4	15	5	395 (73.14)	145 (26.86)
More Preferred	52	8	48	12	51	9	20	---	17	3	18	2	48	12	54	6	52	8	19	1	16	4	17	3	16	4	17	3	16	4	461 (85.38)	79 (14.62)

Figures in parenthesis indicate percentage

4.5.7 Adequacy of information

An ocean of information is available on the web. However, users find it difficult to retrieve desired information due to its unstructured and unorganised nature. In order to know the perception of research scholars pertaining to adequacy of information on web, data gathered found that majority of the scholars (42.96%) believe that adequate information is frequently available. The majority of such scholars (66.66%) are associated with Kashmir University and the least belong to SKIMS(25%). $X^2=26.087$ and $P\text{-Value} = 0.025$ show a slight variation among the scholars of various institutions about this. A similar study conducted under the banner of JSTOR found that faculty members from Humanities, Economics and Social Sciences are satisfied with the variety and adequacy of web resources and they expect to use them more extensively in the future (**Finholt and Brooks, 1997**).

However, 36.29% scholars consider adequate information in web is “sometimes available”. The most of such scholars (55%) are from NISTDS - New Delhi and the minuscule number is associated with Kashmir University (18.33%). A slight variation in perception on this count is indicated from $X^2=23.755$ and $P\text{-Value} = 0.049$ among scholars of various institutions.

The techie savvy research scholars which constitute 20.74% of total population wholly use web for all information needs and believe adequate information in web is always available. The majority of such scholars are seen from I G I B-Delhi(40%) and least in SKUAST-K (13.33%). $X^2=15.433$ and $P\text{-Value} = 0.349$ supports the view that no significant variation among research scholars across all the institutions who are of the perception that adequate information in web is always available. Authenticating the findings further the studies of web resources reveal differences in use. Faculty members and other professionals in the field of Science (74%), Math (69%) and Medicine (88%) were early adopters of electronic journals and other web resources and remain the heaviest and most enthusiastic users (**Rowley 2001; Kidd 2002**). Table 4.5.7 offer a lucid picture.

Table 4.5.7: Adequacy of information and Web Resources

Adequacy of information	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
	n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=540
Sometimes available	11 (18.33)	17 (28.33)	23 (38.33)	6 (30.00)	9 (45.00)	9 (45.00)	21 (35.00)	25 (41.66)	31 (51.66)	8 (40.00)	6 (30.00)	11 (55.00)	6 (30.00)	5 (25.00)	8 (40.00)	196 (36.29)
Frequently available	40 (66.66)	27 (45.00)	29 (48.33)	10 (50.00)	5 (25.00)	8 (40.00)	27 (45.00)	22 (36.66)	19 (31.66)	9 (45.00)	7 (35.00)	6 (30.00)	10 (50.00)	7 (35.00)	6 (30.00)	232 (42.96)
Always available	9 (15.00)	16 (26.66)	8 (13.33)	4 (20.00)	6 (30.00)	3 (15.00)	12 (20.00)	13 (21.66)	10 (16.66)	3 (15.00)	8 (40.00)	3 (15.00)	4 (20.00)	7 (35.00)	6 (30.00)	112 (20.74)
Never available	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Figures in parenthesis indicate percentage

4.5.8 Satisfaction level

The study made an attempt to know the level of satisfaction among research scholars pertaining to time allotted, staff cooperation, printing/downloading facilities and speed of access of web resources.

The allotment of time to access the web resources is a major issue among the research scholars. The scholars need uninterrupted flow of information for their research and time restriction for use of web resources may affect their progress. The study found that 39.07% of scholars are satisfied with the “time allocation” by respective institutions and a sizeable number of scholars (31.85%) are fairly satisfied, 14.62% scholars are highly satisfied, while as 14.44% are not satisfied. Moreover, a significant variation in level of satisfaction is indicated from $X^2=125.540$ and **P-Value = 0.000** among scholars of different institutions.

The availability of adequate “staff assistance” is stated by 38.70% researchers as satisfied, 32.03% “fairly satisfied” and 9.07% “highly satisfied”, whereas around 20.18% scholars are “not satisfied” with present staff level. $X^2=153.223$ and **P-Value = 0.000** reveal a considerable variation among the researchers of various institutions. **Kaushik and Singh (n.p)** found that higher number of scholars (37.93%) are not satisfied with the staff assistance.

“Printing and downloading facilities” are reported by 30.18% scholars as “satisfied”, 44.07% “fairly satisfied” and 12.40% “highly satisfied”, however 13.33% scholars are “not satisfied”. The satisfaction level revealed from $X^2=188.845$ and **P-Value = 0.000** among scholars of different institutions vary significantly. A study by **Mohammad Nasir Uddin (2003)** also found around 55.96% users satisfied with printing/downloading facilities at the campus and rest of scholars are either fairly satisfied (29%) or not satisfied (15.04%) with the present printing and downloading facilities and as such need an improvement.

In addition a good number of scholars (22.59%) are not satisfied with “speed of access” to the web which is challenging concern given the fact that world is moving to 3G and 4G technology of high access speed and scholars in

India are still short of sufficient bandwidth. Around 25.55% scholars are “satisfied”, 36.85% “fairly satisfied” and 15% scholars “highly satisfied” with the “speed of access”. Moreover, a significant variation in level of satisfaction among researchers of different institutions is evident from $X^2=95.762$ and **P-Value = 0.000**. Table 4.5.8 provides a comprehensive account of facts and figures.

Table 4.5.8: User Satisfaction about Access and Availability of Web Resources

Degree of Satisfaction		Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi	Average
		n=60	n=60	n=60	n=20	n=20	n=20	n=60	n=60	n=60	n=20	n=20	n=20	n=20	n=20	n=20	n=20
Time allotted	Satisfied	21 (35.00)	16 (26.66)	25 (41.66)	5 (25.00)	6 (30.00)	10 (50.00)	17 (28.33)	19 (31.66)	14 (23.33)	16 (80.00)	20 (100)	14 (70.00)	8 (40.00)	11 (55.00)	9 (45.00)	211 (39.07)
	Fairly Satisfied	17 (28.33)	23 (38.33)	14 (23.33)	6 (30.00)	8 (40.00)	3 (15.00)	24 (40.00)	22 (36.66)	27 (45.00)	---	---	6 (30.00)	10 (50.00)	5 (25.00)	7 (35.00)	172 (31.85)
	Highly Satisfied	12 (20.00)	15 (25.00)	10 (16.66)	3 (15.00)	---	7 (35.00)	7 (11.66)	11 (18.33)	6 (10.00)	4 (20.00)	---	---	---	4 (20.00)	---	79 (14.62)
	Not Satisfied	10 (16.66)	6 (10.00)	11 (18.33)	6 (30.00)	6 (30.00)	---	12 (20.00)	8 (13.33)	13 (21.66)	---	---	---	2 (10.00)	---	4 (20.00)	78 (14.44)
Staff Incharge	Satisfied	44 (73.33)	19 (31.66)	24 (40.00)	4 (20.00)	6 (30.00)	4 (20.00)	23 (38.33)	19 (31.66)	12 (20.00)	10 (50.00)	7 (35.00)	9 (45.00)	12 (60.00)	7 (35.00)	9 (45.00)	209 (38.70)
	Fairly Satisfied	7 (11.66)	23 (38.33)	17 (28.33)	6 (30.00)	2 (10.00)	9 (45.00)	28 (46.66)	25 (41.66)	18 (30.00)	7 (35.00)	4 (20.00)	3 (15.00)	7 (35.00)	11 (55.00)	6 (30.00)	173 (32.03)
	Highly Satisfied	---	7 (11.66)	7 (11.66)	---	1 (5.00)	---	2 (3.33)	6 (10.00)	7 (11.66)	3 (15.00)	5 (25.00)	8 (40.00)	1 (5.00)	2 (10.00)	---	49 (9.07)
	Not Satisfied	9 (15.00)	11 (18.33)	12 (20.00)	10 (50.00)	11 (55.00)	7 (35.00)	7 (11.66)	10 (16.66)	23 (38.33)	---	4 (20.00)	---	---	---	5 (25.00)	109 (20.18)

Table 4.5.8 Contd.

Printing /Downloading	Satisfied	17 (28.33)	24 (40.00)	12 (20.00)	2 (10.00)	3 (15.00)	4 (20.00)	23 (38.33)	12 (20.00)	17 (28.33)	7 (35.00)	11 (55.00)	11 (55.00)	8 (40.00)	5 (25.00)	7 (35.00)	163 (30.18)
	Fairly Satisfied	28 (46.66)	32 (53.33)	22 (36.66)	5 (25.00)	5 (25.00)	9 (45.00)	32 (53.33)	24 (40.00)	28 (46.66)	10 (50.00)	6 (30.00)	9 (45.00)	9 (45.00)	10 (50.00)	9 (45.00)	238 (44.07)
	Highly Satisfied	15 (25.00)	4 (6.66)	11 (18.33)	---	---	4 (20.00)	5 (8.33)	5 (8.33)	9 (15.00)	3 (15.00)	3 (15.00)	---	3 (15.00)	5 (25.00)	---	67 (12.40)
	Not Satisfied	---	---	15 (25.00)	13 (65.00)	12 (60.00)	3 (15.00)	---	19 (31.66)	6 (10.00)	---	---	---	---	---	4 (20.00)	72 (13.33)
Speed of Access	Satisfied	12 (20.00)	19 (31.66)	9 (15.00)	4 (20.00)	3 (15.00)	6 (30.00)	25 (41.66)	19 (31.66)	12 (20.00)	7 (35.00)	4 (20.00)	3 (15.00)	7 (35.00)	3 (15.00)	5 (25.00)	138 (25.55)
	Fairly Satisfied	26 (43.33)	20 (33.33)	29 (48.33)	6 (30.00)	5 (25.00)	9 (45.00)	19 (31.66)	32 (53.33)	24 (40.00)	2 (10.00)	6 (30.00)	5 (25.00)	4 (20.00)	5 (25.00)	7 (35.00)	199 (36.85)
	Highly Satisfied	7 (11.66)	9 (15.00)	8 (13.33)	---	---	1 (5.00)	10 (16.66)	6 (10.00)	15 (25.00)	6 (30.00)	2 (10.00)	6 (30.00)	2 (10.00)	4 (20.00)	5 (25.00)	81 (15.00)
	Not Satisfied	15 (25.00)	12 (20)	14 (23.33)	10 (50.00)	12 (60.00)	4 (20.00)	6 (10.00)	3 (3.00)	9 (15.00)	5 (25.00)	8 (40.00)	6 (30.00)	7 (35.00)	8 (40.00)	3 (15.00)	122 (22.59)

Figures in parenthesis indicate percentage

4.6. IMPACT ON LIBRARIES

The impact of web resources is enormous on education and research as is clear from findings of the present study. Moreover, the study made an endeavour to know the impact and preparedness of libraries to face the challenges posed in terms of infrastructure availability, selection of web resources, budgetary allocation and proactive services to meet the expectations of users. The data was collected with the help of a structured questionnaire and later analysed under following sections supported with tables. The sections are:

1. Selection
2. Infrastructure
3. Budgetary Allocations
4. Services

4.6.1 SELECTION

4.6.1.1 Choice for Preference and selection

The unique features of web resources makes them more preferred resources over the rest of the formats. To understand different features library manager consider stupendous for choosing the web resources data collected reveals that libraries (of JNU, Jamia Hamdard, I G I B-Delhi and NISTDS -New Delhi)consider all the enumerated features (like Ease of use, Access to many Users, 24X7 Availability, Remote access, No storage hassles, Ability to include text, sound, video & animation, Less maintenance & preservation issues, No delays and Instant & timely access to selection tools) as parameters to subscribe and prefer web resources. However, AIIMSdiffers slightly as it do not consider “Instant & timely access to selection tools” as a good enough feature for their preference.

“Ease of use” and “access to many Users” are dominant characteristics of web resources for selection and preference over other formats considered by all institutional libraries. Likewise,“instant availability” (no delays) of web resources on their publication is another common feature which is unanimously agreed by all the libraries as a basis for their preference. “24X7 availability” is one more influencing characteristic of web resources which turned the wave in their favour and almost all the libraries (except SKUAST-K, NIT-Srinagar SKIMS and IIM – Jammu)consider it amajor parameter for subscribing them. Surprisingly “remote access” capability of the resources is believed to be a foundation for their preference by few libraries (like JNU, Jamia Hamdard, AIIMS, I G I B-Delhi, NISTDS -New Delhi and CWDS – Delhi). Few years ago due to growing nature of the libraries storage of information sources in libraries was a vital problem which overcame by web resources. Thus, overcoming “storage hassles” is a driving feature forselection of web resources by the libraries. Out of fifteen libraries ten (except libraries of Kashmir University, Jammu University, SKUAST-K, SKIMS and CWDS - Delhi)consider it a big relief and as such addresses the problems associated with the growing nature of the collection.

Multimedia characteristic of web resources gives an edge over its traditional counterpart and is appreciated by nine libraries out of fifteen (except SKUAST-K, Kashmir University, Jammu University, NIT, Srinagar, SKIMS and CWDS - Delhi) as distinctive feature to prefer web resource. The traditional information sources need higher degree of preservation and regular maintenance, which is lowest in case of web resources. But only eight libraries consider it a reason to prefer web resources, while rest of libraries (Jammu University, SKUAST-K, NIT, Srinagar, Jamia Millia Islamia, NIMR-Delhi, CWDS – Delhi and IEG – Delhi) do not feel so.

There are various online handy selection tools (Instant & timely access to selection tools) that may help in selection of information sources for institutions with efficiency of time and effort. However, it is found that four institutional libraries among fifteen appreciate these online selection tools and make use of them. Thus, web resources vis-à-vis preference library managers appreciate their diverse features compared to traditional sources. This view is also substantiated by the findings of **Kanamadi and Kumbar (2007)** about strong perception of librarians regarding web resources who prefer them for their unique features. But the awareness and urgency to appreciate all the features to optimum level is still lacking and hence further effort and endeavours on part of library management is required. With the emergence and application of web technology in teaching and research and its widening influence stresses the need for better understanding of them, bearing in mind that future belongs to web technology and access has already taken over the acquisition philosophy. Table 4.6.1.1 offers clear picture and comprehensive information.

Table 4.6.1.1: Features Considered by Library Managers for Selection of Web Resources

FEATURES	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi
Ease of use	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Access to many Users	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
24X7 Availability	✓	✓	X	X	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓
Remote access	X	X	X	X	X	X	✓	✓	X	✓	✓	✓	X	✓	X
No storage hassles	X	X	X	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	X	✓
Ability to include text, sound, video and animation	X	X	X	X	X	✓	✓	✓	✓	✓	✓	✓	✓	X	✓
Less maintenance and preservation issues	✓	X	X	X	✓	✓	✓	✓	X	✓	✓	✓	X	X	X
No delays	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Instant & timely access to selection tools	X	X	X	X	X	X	✓	✓	X	X	✓	✓	X	X	X

4.6.1.2 Subscription Channels

Traditionally information sources particularly journals and books are acquired through vendors to avoid hectic transaction with umpteen publishers. This was financially taxing. Libraries have to pay additional amount in terms of commission to vendors and quite often result into malfunctioning on part of vendors. But with the advent of web resources, the role of these vendors or more precisely agents could be restricted to a great extent. Now, it is found that libraries and information centres more often than not directly approach publishers through online transactions. This has given two benefits to libraries, financial savings and bargaining power to reduce rates further.

It is found that out of fifteen libraries, eleven subscribe web resources directly from the commercial Publishers, except libraries of SKIMS, IIM – Jammu and IEG – Delhi. Besides, library of CWDS – Delhi do not subscribe any web resource. Academic and scholarly societies published web resources are preferred choice of libraries. Twelve libraries prefer to subscribe web resources published by societies. Libraries of SKIMS and NIMR-Delhi do not subscribe such web resources. The subscription from aggregators which are modern agents or interface between the publisher and the library are not yet much popular. It is revealed that only five institutions subscribe web resources through aggregators. The change in channels of subscription of information resources with web technology is having positive impact on acquisition of libraries. The middleman or vendors are minimised and saving money and gaining bargaining power by libraries when subscribing more web resources from a particular publisher. Table 4.6.1.2 provides comprehensible details of the same

Table 4.6.1.2: Web Resources Subscription Channels Opted by Libraries

Channels of Subscription	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi
Commercial Publishers (Directly)	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	--	X
Aggregators	X	X	X	X	X	X	X	✓	✓	✓	✓	X	X	--	✓
Academic and Scholarly Societies	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	X	--	✓

4.6.1.3 E-consortia Need

E-consortia are technological blessing to libraries and its benefits are exploited by majority of libraries irrespective of type and size. It is revealed that eleven libraries in the study affirm that e-consortia overcome budgetary limitations to a large extent when other libraries are not part of any e-consortium.

The price escalation challenge is met with emergence of e-resources and thus has great impact on libraries. It has resulted in a significant growth in library consortia movement. In fact, consortia based subscription of online resources has proved to be a common strategy among the libraries (having similar interests, purposes and needs) to sustain a fruitful collection development. The most reported benefit of the e-consortia is the reduction of the cost by member library operations by obtaining group purchase price for information. **Bosseau et al (1999)** accept the cost effect benefit but argue that "... helping libraries to reduce the cost of purchasing electronic information is a desirable short term goal. However, the true value of consortium comes from helping the library learn how to analyse the quality of resources, how to choose among different purchasing options (e.g. whether to buy journal articles, article by article or by subscription), how to realign the budget to provide capital to invest in electronic resources, how to choose among various options and how to establish priorities for implementation. A library consortium, with a broad understanding of how each of its members is coping with these issues, has an ideal opportunity to explore these issues objectively, to understand and articulate trends as they are merging and to create standardized methodologies that individual libraries can employ and customise at their own institutions." To sum it up in the words of **Allen and Hirshon (1998)** that "E-consortia has broaden our vision from organizational self-sufficiency to a collaborative survival" which is must for libraries round the globe to survive as an institution and serve users with much more resources than one may expect in absence of e-consortia. Table 4.6.1.3 provides a detailed account.

Table 4.6.1.3: Opinion of Librarians on “E-consortia Overcomes Budgetary Constraints”

Overcomes budgetary Constraints	University of Kashmir	University of Jammu	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi
Yes	✓	✓	✓	✓	--	✓	✓	✓	✓	--	✓	✓	✓	--	--
No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

4.6.1.4 E-consortia Tie-ups

Library e-consortia are becoming an essential element in the strategic development of a library to help it in a big way to overcome financial constraints and take services to the next level.

The study found that majority of institutional libraries form a part of different library e-consortia. The 5 libraries (Kashmir University, Jammu University, JNU, Jamia Hamdard and Jamia Millia Islamia) are part of UGC-INFONET e-Journal consortium. Besides, JNU is also part of INDEST e-consortium along with NIT-Srinagar. The NIMR-Delhi is part of consortium set up by its parent organisation ICMR and the consortium is popularly known as ICMR e-consortium. The SKUAST-K is part of CeRA (Consortium for e-Resources in Agriculture), while CSIR is running a separate e-consortium for its various research centres spread out in India known as CSIR E-Journal Consortium and IIM – Jammu, I G I B-Delhi and NISTDS -New Delhi being part of CSIR network in exploiting its resources. SKIMS, AIIMS, CWDS – Delhi and IEG – Delhi are not component of any library e-consortia and are either subscribing journals individually or not subscribing them at all. A study conducted in 2001, report 93% of academic libraries in North America and 34% in U.K purchase e-resources via e-consortia (**Ashcroft & McIvor, 2001**)

The majority of libraries subscribing e-resources via e-consortia is a healthy sign. But, worrying factor is that some special libraries associated with reputed institutions like SKIMS, AIIMS etc. does not join any e-consortium so far. Thus, indirectly depriving users wider access to e-resources. Table 4.6.1.4 gives complete picture of particulars.

Table 4.6.1.4: Various E-consortia Tie-ups

Name of E-consortium	University of Kashmir	University of Jammu	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi
INDEST	--	--	--	✓	--	--	✓	--	--	--	--	--	--	--	--
UGC-Infonet E-Journal	✓	✓	--	--	--	--	✓	✓	✓	--	--	--	--	--	--
ICMR e-consortium	--	--	--	--	--	--	--	--	--	--	--	--	✓	--	--
CeRA	--	--	✓	--	--	--	--	--	--	--	--	--	--	--	--
CSIR E-Journal Consortium	--	--	--	--	--	✓	--	--	--	--	✓	✓	--	--	--

4.6.1.5 Access to E-journal Back-files

The purchase of back-files of journals is important for research and development and no institution can afford to pursue its research without access to massive journal corpse for the use of patrons. The back-files of journals provide users a vast source of knowledge which could not be over sighted. In this milieu sufficient access to back-files is perquisite and it is found that all institution has rights to access back-files of e-journals with an exception of SKIMS which did not reveal this information. Besides, CWDS – Delhi do not subscribe to any e-resource. Table 4.6.1.5 offers a comprehensive description.

Table 4.6.1.5: Access to E-journal Back-files in Libraries

Right to Access Back-files	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi
Yes	✓	✓	✓	✓	∴	✓	✓	✓	✓	✓	✓	✓	✓	∴	✓
No	∴	∴	∴	∴	∴	∴	∴	∴	∴	∴	∴	∴	∴	∴	∴

4.6.1.6 Local Server Storage

In a conventional setup libraries are used to organise and maintain back-files of journals for future use which could turn to be very beneficial if there is some political disturbance, natural calamity or technological fallout. It is revealed that no institution has right to store back-files locally with exception of Kashmir University which claim sometimes they have rights to do so. This is a very grave situation especially if some political disturbances occur in a country and quite often it has seen that all ties are snapped that could have catastrophic effect on research and development. Therefore efforts need to be made to include a clause in the contract to store web resources on local servers. The initiatives such as JSTOR at regional and consortium level will serve to allay well-grounded fears about the lack of permanent archive for electronic publications and according to **Wood and Walther, (2000)** will help libraries with long term costs associated with the storage of back issues. Table 4.6.1.6 provide a detailed account.

Table 4.6.1.6: Rights to Store Back-files on local Server in Libraries

Right to Store Back-files	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi
Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sometimes	✓	--	--	--	--	--	--	--	--	--	--	--	--	--	--

4.6.1.7 Online Journals - Subscription

The subscription of online journals is increasing continuously. It is revealed that JNU alone subscribes to 10,000 of them. The second highest subscription is of Jamia Millia Islamia that subscribes 6,655 e-journals, while Kashmir University, Jammu University and NIT-Srinagar subscribes to 2001-2500 e-Journals each. Moreover, 4 institutional libraries (IIM- Jammu, Jamia Hamdard, I G I B-Delhi and NISTDS -New Delhi) subscribe between 1501-2000 journals. While as, institutional libraries of AIIMS and IEG – Delhi subscribe only 100-500 journals each. In addition NIMR-Delhi subscribes only 60 and SKUAST-K merely 10-15 e-journals which is lowest in the study. The study by **Ashcroft and Langdon (1998)** reveal 19% of UK academic libraries subscribe between 3000 and 5000 e-journals and 46% of North American academic libraries subscribe over 5000 e-journals. The findings of present though somewhat similar in major higher education institutions, but the time gap between the two studies reveal the western universities by now must be subscribing much higher number of e-journals and as such libraries under study need to improve further.

Other than JNU the subscription is very low and has a plenty of scope to improve the subscription for quality and efficient research output. The journals are primary vehicles of knowledge and their sufficient availability can alone take research and development to a higher level. Therefore, adequate funds need to be allocated for the subscription of quality online journals. The present situation is by no means satisfactory. Table 4.6.1.7 gives a thorough account

Table4.6.1.7: Online Journals Subscription in Libraries

No. of Journals	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi
100- 500 Journals	--	--	--	--	--	--	--	--	--	✓	--	--	--	--	✓
501- 1000 Journals	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1001- 1500 Journals	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1501 – 2000 Journals	--	--	--	--	--	✓	--	✓	--	--	✓	✓	--	--	--
2001-2500 Journals	✓	✓	--	✓	--	--	--	--	--	--	--	--	--	--	--
2501- 3000 Journals	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3001 – 3500 Journals	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Any other	--	--	10-15	--	--	--	10,000	--	6,655	--	--	--	60	--	--

4.6.1.8 Impact of Free and Open Access Resources

Libraries around the globe have struggled to subscribe all the information published and have more than often found themselves handicapped due to limited funds to procure more. Even the biggest libraries with enormous funds at their disposal cannot procure all quality information products. In this situation open access resources have given libraries hope to tackle financial constraints. The study found that “Open access journals” are unanimously regarded by all institutions as good source to overcome financial constraints.

Likewise “Open Access Repositories” are also considered by all institutional libraries apart from CWDS – Delhi as an effective source to overcome financial limitations. While as, “Free Reference Sources” too are regarded to trounce financial constraints by majority of libraries. While as, few libraries (NIT, Srinagar, SKIMS, AIIMS and NIMR-Delhi) do not consider them as a source to overcome financial limitations. This may be due to the reason that all these institutions are special in nature and availability of quality reference sources in these subjects may be missing. “Free e-books” are also making their mark and libraries appreciate their presence and find one of the effective sources to minimise financial constraints. The study reveals that out of fifteen institutional libraries eleven libraries regard them a good source to minimise financial constraints with exception of SKIMS, IIM – Jammu, AIIMS and NIMR-Delhi. Again, all these institutions are special in nature and presence of non-availability of free e-books in their areas of specialisation is understood.

Generally speaking the “free and open access resources” are releasing pressure on libraries and information centres to acquire and subscribe more and more toll based resources which is not possible given high subscription rate and squeezing financial allocations. Table 4.6.1.8 offers a complete account of facts and figures.

Table 4.6.1.8: Impact of Free and Open Access Web Resources on Collection Development

Type of Resource	University of Kashmir	University of Jammu	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi
Open Access Journals	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Open access Repositories	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓
Free Reference Sources	✓	✓	✓	X	X	✓	✓	✓	✓	X	✓	✓	X	✓	✓
Free e-books	✓	✓	✓	✓	X	X	✓	✓	✓	X	✓	✓	X	✓	✓

4.6.2 INFRASTRUCTURE

4.6.2.1 Work Stations

The libraries today cannot confine their acquisition to tables and chairs alone they are in need of all modern gadgetry like computers, scanners, printers, copiers, etc. This is indeed need of the hour for accessing information on the web. The study found that central library of Kashmir University possess the maximum number of computers (more than 250) followed by JNU (132), Jammu University and Jamia Millia Islamia (more than 100 apiece). The lowest number of computers is found in IIM – Jammu, CWDS – Delhi and IEG – Delhi (1-10).

The Kashmir University appear to have taken a lead in computerisation and is way ahead of other institutions. But the best thing would be to use the infrastructure optimum to the expectation of the users. Furthermore, the computer ratio seems to be quite rational with majority of the institutions given their limited user base. However, it should have been on higher side in NIT-Srinagar and JNU as they have to cater huge user base. The positive sign of the prevailing situation is that all the institutional libraries are taking acquisition of computers seriously and can turn boon for these institutions in the future, if they keep pace with the technology requirements of their users in relation to research and development. Table 4.6.2.1 provides a complete description.

Table 4.6.2.1: Availability of Work Stations in Libraries

No of Work Stations	University of Kashmir	University of Jammu	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi
1-10	---	---	---	---	---	✓	---	---	---	---	---	---	---	✓	✓
11-20	---	---	---	✓	✓	---	---	---	---	---	✓	---	✓	---	---
21-30	---	---	---	---	---	---	---	✓	---	---	---	✓	---	---	---
31-40	---	---	✓	---	---	---	---	---	---	---	---	---	---	---	---
41-50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
51-60	---	---	---	---	---	---	---	---	---	✓	---	---	---	---	---
61-70	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
71-80	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
81-90	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Any Other	More than 250	More than 100	---	---	---	---	132	---	More than 100	---	---	---	---	---	---

4.6.2.2 High Speed Printer

The libraries of Kashmir University, Jammu University and SKUAST-K claim to have more than three high speed printers being highest in the study, while SKIMS possess three. Four institutional libraries (IIIM – Jammu, Jamia Millia Islamia, AIIMS and NISTDS -New Delhi) claim to possess two high speed printers. Furthermore, three libraries (NIT, Srinagar, I G I B-Delhi and NIMR-Delhi) are found to have only one high speed printers for the benefit of users. Strangely it is found that institutional libraries of JNU, Jamia Hamdard, CWDS – Delhi and IEG – Delhi do not have any high speed printers for users.

The high speed printer for benefit of users is one of the important prerequisite of a library in modern times and can be equated with the possession of reprographic machine which is part of library services. It is strange that good number of institutional libraries do not possess such facilities. Efforts need to be made at the earliest to equip libraries with high speed printers. Table 4.6.2.2 gives a comprehensive account.

Table 4.6.2.2: Availability of High Speed Printer in Libraries

Availability		University of Kashmir	University of Jammu	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi
No		--	--	--	--	--	--	✓	✓	--	--	--	--	--	✓	✓
Yes	One	--	--	--	✓	--	--	--	--	--	--	✓	--	✓	--	--
	Two	--	--	--	--	--	✓	--	--	✓	✓	--	✓	--	--	--
	Three	--	--	--	--	✓	--	--	--	--	--	--	--	--	--	--
	Networked printer	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	More than three	✓	✓	✓	--	--	--	--	--	--	--	--	--	--	--	--

4.6.2.3 Bandwidth Connectivity

The subscription of web resources alone would not fetch results if there is not a good bandwidth available to access these resources. It is found that only three institutions (Kashmir University, IIM – Jammu and JNU) have more than 4 MBps bandwidth and three more are (Jammu University, SKUAST-K and Jamia Millia Islamia) possessing bandwidth of 3-4 MBps. Six institutional libraries (NIT, Srinagar, Jamia Hamdard, AIIMS, I G I B-Delhi, NISTDS - New Delhi and NIMR-Delhi) have 2 MBps bandwidth, while as institutional libraries of CWDS – Delhi and IEG – Delhi possess bandwidth of 1MBps only which is the lowest in the study.

The provision of higher bandwidth is must for better utilisation of web resources particularly multimedia component and to save the precious time of users. The libraries should strive to gain higher bandwidth as present width is not satisfactory particularly with web 2.0 services more and more users are expected to turn online for sharing and exploitation of the information available through different web 2.0 services. Table 4.6.2.3 provides a detailed picture.

Table 4.6.2.3: Bandwidth for Connectivity in Libraries

Bandwidth	University of Kashmir	University of Jammu	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi
1 MBps	---	---	---	---	---	---	---	---	---	---	---	---	---	✓	✓
2 MBps	---	---	---	✓	---	---	---	✓	---	✓	✓	✓	✓	---	---
3 – 4 MBps	---	✓	✓	---	---	---	---	---	✓	---	---	---	---	---	---
More than 4 MBps	✓	---	---	---	---	✓	✓	---	---	---	---	---	---	---	---

4.6.3 BUDGETARY ALLOCATION

The collection development policy has changed with the advent of web resources and more emphasis is given to access over possession. Hence, more focus on budgetary allocation to subscription of online resources. It is found that during 2005 six libraries (SKUAST-K, NIT-Srinagar, JNU, Jamia Millia Islamia, NIMR-Delhi and IEG – Delhi) allocated around 5% -25% of their collection development budget to subscribe web resources, whereas four libraries (IIM – Jammu, AIIMS, I G I B-Delhi and NISTDS -New Delhi) spent around 25%-50% of their budget. However, five institutional libraries (Kashmir University, Jammu University, SKIMS, Jamia Hamdard and CWDS – Delhi) could not provide the information.

In 2006, six libraries (IIM – Jammu, JNU, AIIMS, I G I B-Delhi, NISTDS -New Delhi and IEG – Delhi) spent 25%-50% to subscribe web resources. While as six institutional libraries (Kashmir University, Jammu University, SKUAST-K, NIT-Srinagar, Jamia Millia Islamia and NIMR-Delhi) spent between 5%-25%. Again SKIMS, Jamia Hamdard and CWDS – Delhi were not able to furnish the information.

While during 2007, three libraries (IIM – Jammu, JNU and AIIMS) have exceeded to spend above 50% of their budget for collection development on web resources alone, which is the highest for year 2007. The second highest i.e. 25%-50% is spent by five libraries (NIT-Srinagar, Jamia Millia Islamia, I G I B-Delhi, NISTDS -New Delhi and IEG – Delhi). Besides, four libraries (Kashmir University, Jammu University, SKUAST-K and NIMR-Delhi) spent only 5%-25% of allocated amount to subscribe web resources.

In 2008, again three libraries (IIM – Jammu, JNU and AIIMS) spent more than 50% of their allocated amount for collection development to subscribe web resources. Accordingly five libraries (NIT-Srinagar, Jamia Millia Islamia, I G I B-Delhi, NISTDS -New Delhi and IEG – Delhi) spent around 25%-50% and five libraries (Kashmir University, Jammu University, SKUAST-K, Jamia Hamdard and NIMR-Delhi) only 5%-25%.

The study conducted by **Dulaymi et al (2004)** on Saudi Arabia Academic Libraries (SALs) found exponential growth of budgetary allocation for

subscription of e-journals. The SALs budget of print journals in the year 1995 was 8,295,151 Saudi Riyals and that of e-journals was 470,000. In the year 1996 the budget of print journals was increased by an average of only 6.29%, while e-journals increased by 125.53%. The study further reveals that acquisitions of print journal titles have rapidly decreased since 1997. In the year 1996, print journals show an average increase of 2.79% only, while e-journals increased highly by 97.9% in the same year, which corresponds to the extreme increase in the budget of e-journals in 1996 by 125%. The SALs show a sharp decrease of 6% in print journals in 1999 which again corresponds with the simultaneous increase in e-journals titles by 10.35%.

So the impact of web resources is enormous on collection development policies of libraries. The domination of web resources in a short period of their arrival is phenomenal. It has already encroached between 1/4th to more than half of the allocated budget for collection development. There is likelihood that this trend is going to accelerate further. Table 4.6.3 presents a comprehensive picture.

Table 4.6.3: Budgetary Allocations Spent for Subscription of Web Resources

Year		Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi
2005	5%-25%	--	--	✓	✓	--	--	✓	--	✓	--	--	--	✓	--	✓
	25% - 50%	--	--	--	--	--	✓	--	--	--	✓	✓	✓	--	--	--
	50% and Above	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2006	5%-25%	✓	✓	✓	✓	--	--	--	--	✓	--	--	--	✓	--	--
	25% - 50%	--	--	--	--	--	✓	✓	--	--	✓	✓	✓	--	--	✓
	50% and Above	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2007	5%-25%	✓	✓	✓	--	--	--	--	--	--	--	--	--	✓	--	--
	25% - 50%	--	--	--	✓	--	--	--	--	✓	--	✓	✓	--	--	✓
	50% and Above	--	--	--	--	--	✓	✓	--	--	✓	--	--	--	--	--
2008	5%-25%	✓	✓	✓	--	--	--	--	✓	--	--	--	--	✓	--	--
	25% - 50%	--	--	--	✓	--	--	--	--	✓	--	✓	✓	--	--	✓

	50% and Above	---	---	---	---	---	✓	✓	---	---	✓	---	---	---	---	---
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4.6.4 SERVICES

4.6.4.1 Awareness Programmes

In order to exploit the web resources to optimum, libraries need to run various awareness programmes for users. It is found that only a few libraries are conducting different user awareness programmes. The regular awareness programmes are conducted by all the libraries, while as only four (Kashmir University, SKUAST-K, JNU and AIIMS) libraries are found to circulate literature related to awareness and use of web resources. Likewise, use of technology to provide awareness to user is confined to libraries of SKUAST-K, JNU and Jamia Hamdard. These libraries use email as a tool to reach out users and acquaint them with necessary instruction regarding web resources. The SKUAST-K is the only library in the study which besides above methods has incorporated library and web resources use as a compulsory paper in the syllabi.

Ashcroft and McIvor (2001) reveal libraries in UK and North America employ Information Gateways, journal alerts, seminars and workshops to orient users with web resources. The multi-pronged approach is the best strategy to aware users. It could be very beneficial and can provide results in a minimum time. The use of one of the methods is not going to suffice the users with different learning behaviours. So libraries should bear this fact in mind that awareness leads to enlightenment. Table 4.6.4.1 offers a clear picture.

Table 4.6.4.1: Web Resources Awareness Programmes Conducted by Libraries

Type of Program	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi
Regular awareness programmes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Circulate related literature	✓	X	✓	X	X	X	✓	X	X	✓	X	X	X	X	X
Update users through email	X	X	✓	X	X	X	✓	✓	X	X	X	X	X	X	X
Any other	X	X	Incorporated one compulsory paper in the syllabi	X	X	X	X	X	X	X	X	X	X	X	X

4.6.4.2 Alerting Services

Online alerting services are modern services that help users to keep current in their field of specialisation. Now a day variety of these services is provided to users. The study found that ten institutional libraries are offering TOC Alerting service to their users, whereas libraries of Jammu University, SKIMS, IIM – Jammu, Jamia Hamdard and CWDS – Delhi do not provide this service.

The “Profile Alert” service is only provided by libraries of Jamia Hamdard and AIIMS. Likewise, RSS feeds are only offered by IIM – Jammu. This is an area of concern that only a single type of alerting service is generally provided by all libraries. Adequate efforts are needed to offer range of these “alerts” to users particularly research scholars which could prove beneficial for them. A little effort on part of libraries can really change the way research is conducted in educational and research institutions. Table 4.6.4.2 presents a comprehensive picture.

Table 4.6.4.2: Web Based Alerting Services Provided by Libraries

Type of Alert	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi
TOC Alert	✓	X	✓	✓	X	X	✓	X	✓	✓	✓	✓	✓	X	✓
Profile Alert	X	X	X	X	X	X	X	✓	X	✓	X	X	X	X	X
RSS Feeds	X	X	X	X	X	✓	X	X	X	X	X	X	X	X	X

4.6.4.3 Library Information Gateway

Library gateway to free and subscribed web resources is an important tool for users to exploit the information resources not known to them. It is found that libraries of IIM – Jammu, JNU and Jamia Hamdard maintain gateway to “Open Access Resources”, while as rest of the libraries are not offering such facility. Gateway to “Consortium based Resources” is maintained by nine institutions. Likewise, gateway for “Institutional hired Resources” is maintained by ten libraries and the libraries which do not maintain are Kashmir University, SKUAST-K, SKIMS and CWDS – Delhi.

The limited effort on part of libraries to provide gateway facilities particularly to free and open access resources is a grave concern. Sufficient attempts should be made to maintain an exhaust gateway for such available resources. This endeavour can go a long way to fulfil the information needs of the user and minimise the stress and information demand on the library system which in turn will help in satisfying the objectives of the organisation. Table 4.6.4.3 presents a comprehensive picture.

Table 4.6.4.3: Library Information Gateway Maintained by Libraries

Subscription Type	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi
Open Access Resources	X	X	X	X	X	✓	✓	✓	X	X	X	X	X	X	X
Consortium Based Resources	✓	✓	X	✓	X	✓	✓	✓	✓	X	✓	✓	X	X	X
Institutional Hired Resources	X	✓	X	X	X	✓	✓	✓	✓	✓	✓	✓	✓	X	✓

4.6.4.4 Open Access Services in Libraries

The library all over the globe are feeling the brunt of limited and squeezing funds. In order to overcome the crisis libraries have resorted to create institutional repository and library gateways to free resources. It is found that five institutional libraries (Kashmir University, SKUAST-K, IIM – Jammu, JNU and Jamia Millia Islamia) have created their own “Institutional Repositories” to cater information requirements of users. Similarly library gateway to “Free resources” is maintained only by three libraries (IIM – Jammu, JNU and Jamia Hamdard) to overcome financial limitations.

The creation of institutional repositories can overcome the budgetary constraints if every institution library comes up with the repository. It should be thus among the priorities of each and every institution. Similarly, the creation of library gateway to free resources is imperative to provide wide range of resources to users and help in exploit the free resources to a maximum. Table 4.6.4.4 presents a comprehensive picture.

Table 4.6.4.4: Open Access Services in Libraries

Open Access Services	Kashmir University	Jammu University	SKUAST-K	NIT, Srinagar	SKIMS	IIIM - Jammu	JNU	Jamia Hamdard	Jamia Millia Islamia	AIIMS	I G I B-Delhi	NISTDS -New Delhi	NIMR-Delhi	CWDS - Delhi	IEG - Delhi
Created Institutional Repository	✓	X	✓	X	X	✓	✓	X	✓	X	X	X	X	X	X
Maintains Library Gateways to Free Resources	X	X	X	X	X	✓	✓	✓	X	X	X	X	X	X	X

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FINDINGS AND CONCLUSION

5.1 TESTING OF HYPOTHESES

HYPOTHESIS I

H_0 = *Email like other internet services is used equally by research scholars of different institutes.*

H_1 = *Email is most popular service among research scholars of different institutes.*

It is found that all research scholars associated with different institutions under study unanimously identified e-mail as the most popular service and majority of scholars (73.70%) mainly use it for research purpose, which is further substantiated by $X^2=8.733$ and **P-Value = 0.848**. Therefore null hypothesis (H_0) is rejected and alternate hypothesis (H_1) is accepted.

HYPOTHESIS II

H_0 = *Scholars of different institutes do not identify URLs of new web resources mainly by search engines.*

H_1 = *Scholars of different institutes identify URLs of new web resources mainly by search engines.*

It is found that Search engines are the most popular way for finding the new URLs among scholars (37.59%) and there is no significant difference between research scholars of various institutions on this as indicated by $X^2=20.760$ and **P-Value = 0.108**. As a result null hypothesis (H_0) is rejected and alternate hypothesis (H_1) is accepted.

HYPOTHESIS III

$H_0=$ *Use of print & web resources among research community is similar in different institutes.*

$H_1 =$ *Use of print & web resources among research community is not similar in different institutes*

The study reveals that majority of research scholars (48.88%) equally use print and web resources for research across all the institutions. Further, $X^2=6.537$ and **P-Value = 0.951** supports the view that a non-significant difference lies between research scholars of various institutions about using print cum web resources for research. Thus null hypothesis (H_0) is accepted and alternate hypothesis (H_1) is rejected.

HYPOTHESIS IV

$H_0=$ *scholars of different institutes perceive that web resources and traditional resources are equally comprehensive.*

$H_1 =$ *scholars of different institutes perceive that web resources are more comprehensive than traditional resources.*

$X^2=26.832$ and **P-Value = 0.020** shows a considerable difference among the scholars of different institutes regarding the perception that web resources are more comprehensive than traditional resources. Hence, null hypothesis (H_0) is accepted and alternate hypothesis (H_1) is rejected.

5.2 FINDINGS

Prosperity and development of a nation is directly proportional to the quality and quantity of research done by higher education and research institutions. A quality research can only be conducted when these centres of excellence have adequate access to knowledge, the researchers are fully aware and utilise modern formats of information. In this milieu the present study made an endeavour to know the level of awareness, use and degree of satisfaction with the web resources among research community of select institutions. The findings of the study are as follows:

5.2.1 GENERAL DESCRIPTION

1. University/institution is the most popular location for accessing internet among scholars, whereas cybercafés is the least preferred.
2. A whole range of services are offered by the internet, but WWW and E-mail are the most popular services of the internet exploited by all the scholars and chatting is found least exploited service.

5.2.2 IDENTIFICATION

1. Scholars employ e-mail service more for research than personal matters and entertainment.
2. Scholars identify new web resources mainly through Search engines especially from “Google” and “Yahoo”. However, “Listserve” is also considered second popular source for finding new URLs. The scholars are not well aware with other organised sources for finding new and reliable web resources like subject gateways, etc. as such they rely heavily on search engines.

3. “Google” is the most popular primary search engine among scholars and “Gigablast” the least, which further confirms the wide coverage and effective ranking mechanism of “Google”.
4. The awareness level among the scholars regarding meta-search engines is scarce. However, Meta-search engine “Dogpile” is used by good number of scholars in retrieving the information from web. The other meta-search engines exploited by fewer research scholars are “go2net”, “c4” and “qbsearch”.
5. Special search engine is a recent phenomenon, therefore making inroads and gaining trust of users may take some more time in gaining popularity and place in search and retrieval arena. Yet study found that “Scirus”, the prominent special search engine vastly used by scholars followed by “CompletePlanet” and “Fossick” is less preferred.
6. Primary literature web directories “DOAJ” and “OpenDOAR” are consulted predominantly, which divulge that the directories cataloguing primary literature are preferred by the researchers. In contrast web directories like “Galaxy” and “Web Beacon” are least exploited.
7. Subject gateways does not appear popular like primary search engines. However, subject gateways “Virtual Library” and “Intute” are exploited most by the scholars. While as, the NBS (Architecture, Engineering) and BIZ/ED (Business & Economics) subject gateways cater the information requirements of limited area of knowledge.
8. Science databases are exploited more than other streams of knowledge. The high use of science databases could be attributed to high level of awareness and readiness to exploit these resources by researchers. “Pubmed” is the highly exploited and “LexisNexis Academic” least.

9. The “Springer” is the most popular commercial journal publisher among the scholars. In category of Scholarly Societies & Academic Institutions published journals “Cambridge University Press” is the highly popular source.

5.2.3 WEB RESOURCES AWARENESS

1. Scholars are fully aware with “Online journals” and “E-books”. In addition “Wikis” and “Blogs” also gaining popularity and considerable number of scholars are aware of these new emerging web resources, whereas reference sources are least known web resource.
2. “Trial and Error” is predominantly used mode for locating new web resources. This makes it clear that no well organised programme is run by institutions to educate and aware scholars with new and existing information resources and majority of the scholars rely on unsystematic approach and thus miss relevant resources.
3. Awareness of online Academic/Scholarly Journals is found among all the scholars followed by Current Affairs/Opinion magazines, whereas the scholars are little aware with trade journals.
4. Awareness of “Full Text databases” is optimum among scholars followed by “Bibliographic databases”, due to more interest in full text of the relevant documents compared to “Referral” or “Directory databases”.
5. Online “Encyclopaedias” are known to the scholars followed by “Dictionaries” and “Handbooks”. “Manuals” are still least famous among the researchers.
6. Majority of scholars are fully aware about “Subject repositories” and “Institutional repositories”.

5.2.4 WEB RESOURCES-USE

1. Scholars primarily use internet for research and secondly to communicate with peers and pals. However, downloading of software is not among the priorities of researchers.
2. “Online journals” are used by all the scholars, whereas “E-books” turn to be second popular e-resource. The popularity of different web resources among scholars is gaining momentum to grow further in coming years.
3. Majority of the scholars use internet for more than two years clearly indicating the impact of web on research community.
4. Most of the scholars use Print and Web resources equally for research. Though the use of web resources in research is quite remarkable given their recent emergence but it has not overshadowed the print resources completely.

5.2.5 DEGREE OF SATISFACTION WITH WEB RESOURCES

1. The content of web resources is considered by majority of scholars more comprehensive and rich than traditional resources. Overwhelming majority of scholars feel web resources are frequently updated than traditional resources.
2. The “Timeliness” feature of web resources is unique and it plays an important role for their popularity.
3. The problem faced by scholars in accessing web resources is that ‘too much information is retrieved’. The other big hurdles are difficulty in finding the relevant information and lack of IT skills.

4. Majority prefer web resources over print resources for being more informative and other useful features like multimedia component, easy to use and saving time.
5. Scholars affirm adequate information is frequently available in web resources.
6. Scholars are satisfied with time allocation by the institutions and assistance provided by staff in accessing web resources.
7. Scholars are fairly satisfied with the printing, downloading facilities and with speed of Access through web.

5.2.6 IMPACT ON LIBRARIES

1. Web resources subscription directly from commercial publishers and Academic & Scholarly Societies are preferred channels over aggregators. The web technology is reducing the need of middlemen and vendors in subscription of information resources. This is having positive impact on acquisition of libraries like saving financial resources usually given to vendors as commission and ensure more bargaining power to libraries.
2. Most of the libraries understand that E-consortia are able to overcome budgetary problems to large extent and are becoming largely part of one or more national e-consortia.
3. All the libraries tend to have access to e-journal back-files, but still not in a position to store back-files largely.
4. JNU alone is found to subscribe more than 10,000 e-journals, while rest of institutions are subscribing less number of e-journals.
5. “Open access journals” are becoming a good resource to overcome financial constraints. Likewise, “open access repositories” are gaining sustenance by all libraries in promoting dissemination of research outfits.

6. The computer user ratio is found quite rational with majority of the institutions.
7. Most institutional libraries still do not possess high speed printers.
8. The bandwidth connectivity does not exceed 4 MBps and need to be enriched.
9. The libraries generally spent 5 - 50% of their book fund allocation for subscription of web resources. In 2006, 40% libraries spent about 25 – 50% and nearly equal proportion of libraries expended 5- 25% allocation. However, during 2007 and 2008 20% libraries spent more than 50% on web resources which is a positive trend in development of libraries in collection development of resources due to their umpteen benefits for the users.
10. All libraries conduct regular web awareness programmes and SKUAST-K is found to have incorporated library orientations as one of the papers in the curriculum.
11. Online TOC alert is the most common service offered by libraries.
12. Three institutional libraries are found to maintain gateway for open access resources. On contrary majority of libraries maintain gateway for consortium based and institutional hired web resources.
13. The OA repositories are fast becoming special vehicle for an institution to publicise and propagate the research contributions and achievements and accordingly five has designed their own OA repositories.

5.3 SUGGESTIONS&CONCLUSION

With the advent of World Wide Web and development of various web based resources information seeking behaviour of scholars has changed. Users make more use of web and web resources with every passing day for satisfying their information needs. Research scholars generally need to know everything relevant to their field of interest and web provide them effective and efficient means to stay current.

Web being powerful service of internet provides access to numerous web resources like databases, wikis, blogs, e-books and online journals etc. instantly. Various studies already conducted to identify the use and awareness of web resources among different categories of users viz (Shoham, 1998), Becker (1998), KooganurmathandJange (1999), Bavakutty and Salih (1999), AmritpalKaur (2000), Allehaibi (2001), Chang andPerng (2001), Al-Harbi (2002), Bar-Ilan, Peritzaand Wolman (2003), Ongondaand Raymond (2004), Asemi (2005), Al-Ansari (2006), Kanungo (2007) and Mohammad Nazim (2008)etc. throw light on various aspects relating to the use of web resources in different research and educational institutions world over. But, no comprehensive study has been conducted to understand the mechanism how users identify new web resources, their awareness level, use and degree of satisfaction with web resources especially with special reference to Jammu & Kashmir and Delhi. Therefore, present endeavour is to acquire a more in-depth understanding of the users and suggest some concrete measures to ensure effective exploitation of web resources.

Majority of scholars use internet at their parent institution for web and email services. The present revelations may be due to the fact that either scholars do not have adequate ICT facilities available at home which may be reflective of their economic status or because that most of the scholarly content available on the web is toll based and institutions being subscribers of these valuable knowledge assets drive scholars more to institution available access points

than availing them from internet cafes or at home. The solution to first inference is that scholars may be facilitated to avail soft loans to purchase laptops for 24X7 access to web and its umpteen resources. This would go a long way in elevating the research standards in the country and would give scholars necessary confidence and motivation to compete with the scholars of developed world who possess these facilities and as such generate and share information through various web resources especially web 2.0 tools off late. The second reason for high use of institutional access points could overcome by use of proxy servers by the institutions to decentralise the use of IP enabled toll based resources subscribed by the institutions. This technology has proved quite useful and is being widely used by the academic institutions.

The scholars are not well aware about use of different types of search tools like meta-search engines, special search engines, directories, gateways etc. to identify new resources. It was found scholars usually use primary search engines that too Google and Yahoo more often than not. In this milieu regular awareness and orientation programmes need to be conducted to educate users about different search tools and techniques available and their effectiveness in retrieving information more relevant and useful to the user. This could go a long way in saving the time of users especially scholars who are always look out for the relevant information. The benefits of the web could not be reaped unless users do not know the proper harvesting tools and mechanism as such demand proper attention.

The awareness level of different types of web resources is though good, but by no means satisfactory. Again, respective libraries need to organise awareness programme for scholars and students to acquaint them with various web resources and their benefits to the community, especially about fast emerging web resources like ETDs, Wikis and Blogs. These new web resources are very beneficial for the research community and are instant mediums of sharing and improving information with collaborative ventures.

The shift in information seeking pattern of scholars reflect that around half of the scholars use web and print resources equally for research. This is quite drastic change in light of the fact that web resources have just arrived and already their impact is huge on scholar community. In this milieu sufficient efforts should be made to educate and train users for taking maximum benefits from web resources. While at the same time print sources cannot be ignored and will stay relevant for long time to come as such their proper preservation and management is also imperative to conduct research smoothly.

On the whole scholars seem to be satisfied with unique and effective features of the web resources and are preferred choice of scholars. The scholars are also fairly satisfied with the ICT facilities available at their respective institutions. But there is room to improve the ICT infrastructure available and as such high speed access to internet and high end printer for quick printing facilities is the need of the hour and should be improved given the fact much of information now being available online and more users are expected to throng the internet facilities and may demand printing of downloaded information for thorough study and comprehension.

The web resources have positive impact on collection development policy of the libraries. It is evident that most of libraries prefer subscribing web resources through direct publishers and scholarly societies thus avoiding vendor or intermediaries to a large extent. This shall save financial resources and enhance the acquisition programme.

Most of the libraries believe e-consortia are able to overcome budgetary problems to a great extent and are part of one or more national e-consortia. This is imperative for libraries to cooperate with each other in subscription of information resources and to overcome squeezing finances and high expectations from the patrons.

Almost all the libraries are found to have access to e-journal back-files, but alone Kashmir University is found to have right to store back-files on local server. There is a grave concern to meet their archiving function, especially to meet special circumstances like political disturbances, natural calamities, technical fallouts etc.

One institutional library alone was found to subscribe more than 10,000 e-journals, while other institutions subscribe less number. It is a concern which needs to be addressed in light of the fact that tens of thousands of quality journals are available online. The access to limited journals is depriving scholars adequate access to primary sources and as such hampering quality research. The national level e-consortia like UGC-INFONET should enhance their acquisition policy to enrich the consortium with more quality resources for users of all the institutions in the country.

Merely three institutional libraries are found to maintain gateway for open access resources. This again shows the non-seriousness on part of libraries to exploit the free resources for the benefit of its clientele.

Bandwidth of internet is central to web resources which is a great concern as few institutions (here 3) are having 4MBPS. The libraries need to make efforts to acquire more bandwidth particularly with emergence of web 2.0 services helping users to turn online for sharing and exploitation of the information.

A good amount of budget is being allocated for acquisition of web resources which need to be encouraged to help scholars to get timely information.

It is safely concluded that web resources have enormous impact on information seeking behaviour of researchers and information resource management of libraries. It is a first choice of scholars in searching relevant information and preferred for its unique features that have resounding effect on its optimum use. This trend is gaining further impetus in coming years as

such it is imperative on library and information centres to gear up and accept the challenge. The proactive approach on part of library and information science professionals in terms of conducting regular orientation and training programmes on “web services and resources” for users, organising and updating library information gateways to free and fee based web resources and creating institutional repositories to promote and highlight the intellectual contribution of the institution has dawned a new future for both libraries and scholars.

5.4 FUTURE AREAS OF RESEARCH

The future belongs to web resources and access to majority of information sources in near future will be available under umbrella of web. Already numerous digitisation projects world over have made a big contribution to the ocean of information available to user in web. This wave is going to gain further momentum. So in order to equip users with the nitty-gritty of the web and web resources it is imperative to know how they are using the web. The present study made an endeavour to know the level of use and awareness of the web resources which could be carried further by studying various emerging web based technologies & services and their impact on the user. The possible future areas of research could be:

- ❖ Understanding the impact and contribution of social networking sites in evolving specific research based community to share knowledge.
- ❖ To know contribution of scholars in our part of the world while using and sharing information through Wikis and Blogs.
- ❖ To identify the perception and use of different web 2.0 services by the scholars and how these are having impact on research community.
- ❖ To identify mechanism of work of various consortia in India and how it could be improved further.
- ❖ To understand the impact of web on generation of digital migrants and what possible psychological and technical measures should be taken to acclimatise them with the web and web resources.

Questionnaire for Research Scholars

Respected Sir/Madam

I have undertaken a study of “*Use of Web Resources by Research Scholars in select institutes of J&K and Delhi*” for my Ph.D Programme in field of Library and Information Science.

It is an uphill task but your valued cooperation and contribution will help me in completion of this task to a great extent. As such it is requested to kindly fill up the questionnaire, which will be highly acknowledged.

Thanks.

TabasumMaqbool
(Research Scholar)
University of Kashmir

QUESTIONNAIRE

(Mark tick (✓) wherever applicable)

Name _____

Gender Male Female

Affiliation

a) Institute _____

b) Sector/Deptt. _____

Currently pursuing

M.Phil PhD Research Project Any other (please specify) _____

.....
Section A: General

Q. 1. I use Internet at

- a) Home
- b) University/Institution
- c) Cybercafe
- d) Else where (please specify) _____

Q. 2. I avail following services through internet

- a) E-mail
- b) WWW
- c) FTP
- d) Listserve
- e) Chatting
- f) Any other (please specify) _____

Q.3. I mainly use the e-mail for the purpose of

- a) Research
- b) Personal matters
- c) Pleasure
- d) Any other (please specify) _____

Section B: Identification

Q. 4. Inormally find out URL of relevant web resources from

- a) Listserves
- b) Friends
- c) Journal Citations
- d) Subject Gateways
- e) Web Directories
- f) Search engines
- g) Teachers/ Supervisors
- l) Any other, plz specify _____

Q. 5. I know and use following General Search engine(s) for information retrieval

- a) Google
- b) Yahoo
- c) Lycos
- d) AltaVista
- e) MSN Live
- f) Gigablast
- g) Any other (please specify) _____

Q. 6. I know and use following Meta Search engine(s) for information retrieval

- a) Dogpile
- b) Vivisimo
- c) go2net
- d) c4
- e) mamma
- f) qbsearch
- g) search
- h) Any other (please specify) _____

Q.7. I know and use following Special Search engine(s) for information retrieval

- a) Scirus
- b) Scienceresearch
- c) CompletePlanet
- d) SearchEd
- e) Fossick
- f) Scitopia

g) Any other (please specify) _____

Q.8 I know and use following Web Directories for locating information resources

- | | | | |
|----------------------|----------------------|-------------------------------|----------------------|
| a) Yahoo (Directory) | <input type="text"/> | b) Google (Directory) | <input type="text"/> |
| c) Galaxy | <input type="text"/> | d) Quest | <input type="text"/> |
| e) DOAJ | <input type="text"/> | f) DMOZ | <input type="text"/> |
| g) Linkopedia | <input type="text"/> | h) Web Beacon | <input type="text"/> |
| i) MassiveLinks | <input type="text"/> | j) OpenDOAR | <input type="text"/> |
| k) ROAR | <input type="text"/> | l) Any other (please specify) | _____ |

Q. 9 I know and use following Subject Gateways for locating information resources

- | | | | |
|--------------------------------------|----------------------|---|----------------------|
| a) Intute (General Gateway) | <input type="text"/> | b) AHDS (Arts and Humanities) | <input type="text"/> |
| c) SciCentral (Science) | <input type="text"/> | d) BIOME (Health Sciences) | <input type="text"/> |
| e) BIZ/ED (Business & Economics) | <input type="text"/> | f) NBS: (Architecture, Engineering, Construction) | |
| g) Virtual Library (General Gateway) | <input type="text"/> | h) Any other (please specify) | _____ |

Q. 10 I know and use following Subject Databases regularly for information

- | | | | |
|--|----------------------|---|----------------------|
| a) Pubmed | <input type="text"/> | b) Pubscience (pubsci.osti.gov) | <input type="text"/> |
| c) ERIC Database | <input type="text"/> | d) SciBase (thescientificworld.com/scibase) | <input type="text"/> |
| e) UNESCO's Social Science Database (unesco.org/most/dare.htm) | <input type="text"/> | f) LexisNexis Academic | <input type="text"/> |
| g) Academic Search Elite (EBSCO) | <input type="text"/> | h) Any other (please specify) | _____ |

Q.11 I know and use journal resources of following Publisher(s) through net

- | | | | |
|-------------------------------------|----------------------|-------------------------------|----------------------|
| a) Blackwell Publishers | <input type="text"/> | b) Kluwer Academic Publishers | <input type="text"/> |
| c) Elsevier Science (Sciencedirect) | <input type="text"/> | Emer Link | <input type="text"/> |
| e) Emerald | <input type="text"/> | and Francis | <input type="text"/> |
| g) Sage Publications | <input type="text"/> | h) Any other (please specify) | _____ |

Q.12 I know and use following Journal portals(of Scholarly Societies and Academic Institutions) available through net

- | | | | |
|---------------------------------------|----------------------|----------------------------------|----------------------|
| a) ACM (American Computing Machinery) | <input type="text"/> | IEEE Library | <input type="text"/> |
| c) American Chemical Society | <input type="text"/> | d) American Institute of Physics | <input type="text"/> |
| e) Cambridge University Press | <input type="text"/> | Academic Press | <input type="text"/> |
| g) Oxford University Press | <input type="text"/> | Any other (please specify) | _____ |

Section C: Awareness

Q.13 I am aware of the following types of Web Resources

- | | | | |
|---------------------------|----------------------|-------------------------------|----------------------|
| a) Online journals | <input type="text"/> | b) E-books | <input type="text"/> |
| c) Databases | <input type="text"/> | d) ETD's | <input type="text"/> |
| e) Wikis | <input type="text"/> | f) Blogs | <input type="text"/> |
| g) Reference sources | <input type="text"/> | h) Preprint Repositories | <input type="text"/> |
| i) Postprint Repositories | <input type="text"/> | j) Any other (please specify) | _____ |

Q. 14 I learnt about web resources through

- | | | | |
|---------------------------------------|----------------------|---|----------------------|
| a) Trial and Error | <input type="text"/> | b) Guidance from the library staff | <input type="text"/> |
| c) Course offered by the Institutions | <input type="text"/> | d) Course done at a Private Institution | <input type="text"/> |
| e) Any other (please specify) | _____ | | |

Q. 15 I am aware of the following types of online journals

- | | | | |
|--------------------------------------|----------------------|-------------------------------|----------------------|
| a) ACADEMIC/ Scholarly Journals | <input type="text"/> | b) Trade Journals | <input type="text"/> |
| c) Current Affairs/Opinion magazines | <input type="text"/> | d) Any other (please specify) | _____ |

Q. 16 I am aware of the following types of onlinedatabases

- | | | | |
|----------------------------|----------------------|------------------------------------|----------------------|
| a) Bibliographic Databases | <input type="text"/> | b) Referral or Directory Databases | <input type="text"/> |
| c) Numeric Databases | <input type="text"/> | Full Text Databases | <input type="text"/> |

Q. 17 I am aware of the following online references sources

- | | | | |
|-------------------------|----------------------|--------------------------|----------------------|
| a) Encyclopedias | <input type="text"/> | b) Dictionaries | <input type="text"/> |
| c) Biographical sources | <input type="text"/> | d) Thesaurus | <input type="text"/> |
| e) Maps | <input type="text"/> | f) Handbooks and Manuals | <input type="text"/> |

Q. 18 I am aware of the following types of online Repositories

- | | | | |
|------------------|----------------------|----------------|----------------------|
| a) Institutional | <input type="text"/> | b) Subject | <input type="text"/> |
| c) Governmental | <input type="text"/> | d) Aggregators | <input type="text"/> |

Section D: Use

Q. 19I use Internet for purpose of

- | | | | |
|--------------------------|----------------------|------------------------------|----------------------|
| a) Research Work | <input type="text"/> | b) Communication with Peers | <input type="text"/> |
| c) Recreation | <input type="text"/> | d) News | <input type="text"/> |
| e) Downloading Softwares | <input type="text"/> | f) Anyother (please specify) | <input type="text"/> |

Q. 20 I use Web Resources

- Yes No

If yes, I consult following Web Resources regularly

- | | | | |
|-------------------------------|----------------------|--------------------------|----------------------|
| a) Online journals | <input type="text"/> | b) E-books | <input type="text"/> |
| c) Databases | <input type="text"/> | d) ETD's | <input type="text"/> |
| e) Wikis | <input type="text"/> | f) Blogs | <input type="text"/> |
| g) Reference sources | <input type="text"/> | h) Preprint Repositories | <input type="text"/> |
| i) Postprint Repositories | <input type="text"/> | | |
| J) Any other (Please Specify) | <input type="text"/> | | |

Q. 21 I have been using the Web Resources for

- | | | | |
|----------------------|----------------------|-------------------------|----------------------|
| a) Less than 6 month | <input type="text"/> | b) 6 months to One year | <input type="text"/> |
| c) One to Two years | <input type="text"/> | d) More than two year | <input type="text"/> |

Q.22 I use web resources in my research

- | | | | |
|----------------------------|----------------------|---------------|----------------------|
| a) Exclusively | <input type="text"/> | b) Mainly | <input type="text"/> |
| c) Equally (Print and Web) | <input type="text"/> | d) Negligibly | <input type="text"/> |

Section E: Satisfaction

Content

Q. 23I find contents of web resources are

- | | | | |
|---|----------------------|-------------------------------------|----------------------|
| a) More Comprehensive and rich than Traditional resources | <input type="text"/> | b) Similar to Traditional resources | <input type="text"/> |
| c) Less Comprehensive than Traditional resources | <input type="text"/> | d) I Can't Comment | <input type="text"/> |

Q. 24I find contents of Web Resources are

- | | | | |
|--|----------------------|--|----------------------|
| a) Frequently Updated than traditional Res. | <input type="text"/> | b) Similar to as traditional Resources | <input type="text"/> |
| c) Seldom Updated than Traditional Resources | <input type="text"/> | d) I Can't Comment | <input type="text"/> |

Delivery

Q. 25Igrade features of Web Resources forresearch work as.

- | Features | Poor | Good | V.Good | Excellent |
|------------------|----------------------|----------------------|----------------------|----------------------|
| a) Accessibility | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

- b) Accuracy
- c) Availability
- d) Consistency
- e) Ease of Use
- f) Flexibility
- g) Timeliness
- h) Uniqueness
- i) Usefulness
- j) Permanence

Q. 26I consider hindrances in access of web resources as :

- a) Too much information is retrieved
- b) Time consuming
- c) Lack of IT Knowledge to effectively utilize the services
- d) Limited access to internet
- e) Not being able to find the relevant information
- f) Slow access speed
- g) Difficulty in finding the relevant information
- h) Overload of information
- i) Difficult to read from the screen
- j) Technical problems

Q. 27 I encounter following obstacles in browsing of Web Resources

- a) Frequent power break ups
- b) Internet linkage down
- c) Official Staff asks to leave early
- d) Need to reach home earlier

Adequacy

Q. 28I consider overall use of Web resources compared to traditional resources as:

- a) Time Saving

Y	N
---	---
- b) Easy to Use

Y	N
---	---
- c) More Informative

Y	N
---	---
- d) More Useful

Y	N
---	---
- e) More Preferred

Y	N
---	---

Q. 29I find adequate information in Web Resources

- a) Sometimes available
- b) Frequently available
- c) Always available
- d) Never available

Q. 30My level of satisfaction with regard to access and availability of Web Resources in my institution is

- | Aspects | Satisfied | Fairly Satisfied | Highly Satisfied | Not Satisfied |
|-------------------------|----------------------|----------------------|----------------------|----------------------|
| a) Time allotted | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| b) Staff Incharge | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| c) Printing/Downloading | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| d) Speed of Access | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

Questionnaire for Libraries

Respected Sir/Madam

I have undertaken a study of “*Use of Web Resources by Research Scholars in select institutes of J&K and Delhi*” for my PhD Programme in field of Library and Information Science. One of the objectives is to ascertain the “Impact of web resources on collection development policy in libraries”

As such it is requested to kindly fill up the enclosed questionnaire, which will be highly acknowledged and will help me to understand the impact.

Thanks.

TabasumMaqbool
(Research Scholar)
University of Kashmir

QUESTIONNAIRE

(Mark tick (✓) wherever applicable)

GENERAL

Name of the Institution _____

Name of the Library _____

Year of establishment of Library _____

Number of Bona-fide Users _____

Number of Research Scholars enrolled as members' _____



SELECTION

Q.1 Our library prefer to get access to web resources for the following features

a) Ease of use,	<input type="checkbox"/>	b) Access to many Users	<input type="checkbox"/>
c) 24X7 Availability	<input type="checkbox"/>	d) Remote access	<input type="checkbox"/>
e) No storage hassles	<input type="checkbox"/>	f) Ability to include text, sound, video and animation	<input type="checkbox"/>
g) Less maintenance and preservation issues	<input type="checkbox"/>) No delays	<input type="checkbox"/>
i) Instant & timely access to selection tools	<input type="checkbox"/>	j) Any other, please specify _____	

Q.2 Our institution subscribes to web resources from reputed

a) Commercial Publishers (Directly)	<input type="checkbox"/>	b) Aggregators	<input type="checkbox"/>
c) Academic and Scholarly Societies	<input type="checkbox"/>	d) All the Above Sources	<input type="checkbox"/>

Q.3 E-consortia's are helping to overcome budgetary constraints of our institution and offer wide range of web resources to user

a) Yes	<input type="checkbox"/>	b) No	<input type="checkbox"/>
--------	--------------------------	-------	--------------------------

Q.4 We are members/associated with following e-consortia

a) INDEST	<input type="checkbox"/>	UGC-Infonet E-Journal Consortium	<input type="checkbox"/>
c) ICM e-consortium	<input type="checkbox"/>	d) MCIT Library Consortium	<input type="checkbox"/>
e) Any other please specify _____			

Q.5 Our subscription to web resources include access to the e-journal backfiles

a) Yes	<input type="checkbox"/>	b) No	<input type="checkbox"/>
--------	--------------------------	-------	--------------------------

Q. 6 Our e-consortium/consortia has the right to store backfiles on our local server as well

a) Yes	<input type="checkbox"/>	b) No	<input type="checkbox"/>	c) Not applicable	<input type="checkbox"/>
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- Q.7 The number of journals being subscribed online by our institution are:
- | | | | |
|-------------------------|----------------------|-----------------------------------|----------------------|
| a) 100- 500 Journals | <input type="text"/> | b) 501- 1000 Journals | <input type="text"/> |
| c) 1001- 1500 Journals | <input type="text"/> | d) 1501 – 2000 Journals | <input type="text"/> |
| e) 2001-2500 Journals | <input type="text"/> | f) 2501- 3000 Journals | <input type="text"/> |
| g) 3001 – 3500 Journals | <input type="text"/> | h) Any other please specify _____ | |

- Q.8 The emergence of quality web resources, having free access is of great help to overcome financial constraints of libraries

a) Open Access Journals	<table border="1"><tr><td>Y</td><td>N</td></tr></table>	Y	N	Open access Repositories	<table border="1"><tr><td>Y</td><td>N</td></tr></table>	Y	N
Y	N						
Y	N						
c) Free Reference Sources	<table border="1"><tr><td>Y</td><td>N</td></tr></table>	Y	N	Free e-books	<table border="1"><tr><td>Y</td><td>N</td></tr></table>	Y	N
Y	N						
Y	N						

INFRASTRUCTURE

- Q.9 The institution has following number of work stations for access to web resources
- | | | | |
|----------|----------------------|-----------------------------------|----------------------|
| a) 1-10 | <input type="text"/> | b) 11-20 | <input type="text"/> |
| c) 21-30 | <input type="text"/> | c) 31-40 | <input type="text"/> |
| d) 41-50 | <input type="text"/> | e) 51-60 | <input type="text"/> |
| f) 61-70 | <input type="text"/> | g) 71-80 | <input type="text"/> |
| h) 81-90 | <input type="text"/> | i) Any other please specify _____ | |

- Q.10 The library has high speed printer(s) for the benefit of Users

a) Yes	<input type="text"/>	b) No	<input type="text"/>
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If yes, please specify the number of printers:

a) One	<input type="text"/>	b) Two	<input type="text"/>
c) Three	<input type="text"/>	d) Networked printer	<input type="text"/>
e) More than three	<input type="text"/>		

- Q.11 The library possess following bandwidth communication line for internet connectivity

a) 1 MBps	<input type="text"/>	b) 2 MBps	<input type="text"/>
c) 3 – 4 MBps	<input type="text"/>	d) More than 4 MBps	<input type="text"/>

BUDGET

- Q.12 The following percentage of our books/journals annual budget was spent for getting access to web resources during

Year

2005	5%-25%	<input type="text"/>	25% - 50%	<input type="text"/>	50% and Above	<input type="text"/>
2006	5%-25%	<input type="text"/>	25% - 50%	<input type="text"/>	50% and Above	<input type="text"/>
2007	5%-25%	<input type="text"/>	25% - 50%	<input type="text"/>	50% and Above	<input type="text"/>
2008	5%-25%	<input type="text"/>	25% - 50%	<input type="text"/>	50% and Above	<input type="text"/>

SERVICES

- Q.13 In order to exploit the web resources to optimum use, we conduct

a) Regular awareness programmes	<input type="text"/>	b) Circulate related literature	<input type="text"/>
c) Update users through email	<input type="text"/>	d) Any other, plz. Specify _____	

Q.14 We regularly provide following web based Alerting Services to our users in their respective fields

- a) TOC Alert b) Profile Alert
c) RSS Feeds d) All of the above

Q.15 We are maintaining Library Information Gateway to following types of resources

- a) Open Access Resources Consortium Based Resources
c) Institutional Hired Resources All of the above

Q.16 The budgetary constraints and increased demand for wide access to online information resources led our library to

- a) Create Institutional Repository
b) Create Library Gateways to free resources

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