FAIR USE VS COPYRIGHT NON-COMPLIANCE AMONG THE ACADEMIC COMMUNITY IN UNIVERSITIES OF DEVELOPING NATIONS

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Abstract

The purpose of the paper is to assess whether the copyrighted resources in the universities are being used following fair use principle or not and if there is any copyright management policy in the universities to manage the access to those resources. Quantitative data regarding the use of resources in the library collected through online (using survey monkey web platform) and offline were computed through statistical software (MINITAB version 13). Copyright Resources are not used complying fair use principles in the universities of West Bengal and there is no copyright management policy in any university of West Bengal. Considering similar economic conditions, the findings are equally applicable in other developing nations. Study was conducted among the universities of West Bengal. However result of the study is applicable to universities in all developing nations. This study can inform the entire academic community regarding fair use and can make university or appropriate authority feel the need to design and develop balanced and well-defined copyright management policy for the universities. There is close relation in between fair use and economic condition of that country. The unique context of fair use of copyrighted resources in the universities of West Bengal can add to the body of literature related with intellectual property rights in the universities and form the basis, for further comprehensive study.

Key words: E-resources, Copyright, Access, Access management, Digital Library, Copyright Management

1. Introduction

With the advent of Information and Communication Technology (ICT), the whole scenario of learning resources and its access and use pattern in the university libraries has drastically changed all over the world. Words like digital content, electronic library containing e-journals, e-books, journal consortiums, open access, digital library, DRM (Digital Rights Management) all have become simply buzzwords along with the traditional analog or print resources in the present library system. Our Indian Copyright Act, 1957 in its section 52 has listed various kinds of uses of copyrighted materials that are equally applicable for both analog as well as digital contents by which Copyright Act is not violated and these are the fair uses of the copyrighted materials. Considering the changing context and nature of content, use of copyrighted resources by the university academic communities in West Bengal, a highly educated and advanced state in India, is not different from the other developing nations of the world. Therefore it is appropriate to consider universities in developing nations as unique research objects thereby granting proper consideration to universities present in specific geographic locations. The present case study reveals a
disturbing trend which needs to be corrected immediately. From a librarian’s point of view we must ensure that our prime objective of information dissemination is no way blocked by any law or act but at the same time we cannot afford to be cultural cops of the publishers. Thus we must formulate a sensible and balanced policy framework for our university libraries for better copyright management and access management to avoid all kinds of plagiarisms, litigation and above all for the promotion of scholarship and healthy academic culture.

2. Objective of the study

1. To develop a fair use culture of the copyrighted materials among the principal stakeholders of the universities and above all in the higher academic institutions
2. Provide stimulus and encouragement to new creation
3. To make students, teachers, librarians and researchers aware in copyright and academic ethics to save themselves from unnecessary litigation.
4. Copyright mapping among the university libraries and its use pattern for fair use
5. To assess Access Management Policy and Copyright Management Policy (if any) for the universities

3. Research Questions

Present study seeks to assess how far fair uses of the copyrighted materials are being done in the universities. How the access of e-resources are managed in the universities. Answers were sought to the following research questions:

1. Are the copyrighted materials being used in the universities obeying the fair use principles?
2. Is there any copyright management policy in the universities?
3. Is there any access management policy for e-resources in the universities?

4. Assumption

“Copyrighted materials in the university libraries are being used according to the principles of fair use practices and there are well defined copyright management and access management policy in the universities.”

5. Limitations

West Bengal is one of the most important states in India. Present study is limited to 12 Academic Universities, 3 Agricultural oriented Universities, 4 Topical Universities and 1 Open University in West Bengal (table 1). There are some new universities where libraries and its collection are still in developmental stage.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the University</th>
<th>Analog /Print Collection</th>
<th>Digital Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Jadavpur University</td>
<td>600,000 books &amp; 1391 print journals</td>
<td>850 e-books, 9000 e-journals, 15 databases</td>
</tr>
<tr>
<td>2.</td>
<td>University of Calcutta</td>
<td>Ten lakh books</td>
<td>e-books and e-</td>
</tr>
<tr>
<td>No.</td>
<td>University Name</td>
<td>Library Resources</td>
<td>Access Details</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------</td>
<td>-------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>3.</td>
<td>Rabindrabharati University</td>
<td>Approx. 1 lakh books and 304 print journals</td>
<td>e-resources accessed through UGC-Infonet programme</td>
</tr>
<tr>
<td>4.</td>
<td>University of Burdwan</td>
<td>1,58,962 books and 300 print journals</td>
<td>e-resources accessed through UGC-Infonet programme</td>
</tr>
<tr>
<td>5.</td>
<td>University of Kalyani</td>
<td>150,000 books and 110 print journals</td>
<td>e-resources accessed through UGC-Infonet programme</td>
</tr>
<tr>
<td>6.</td>
<td>Vidyasagar University</td>
<td>71,877 books and 125 print journals</td>
<td>e-resources accessed through UGC-Infonet programme</td>
</tr>
<tr>
<td>7.</td>
<td>Viswa Bharati University</td>
<td>700,000 books and print journals 20000</td>
<td>e-resources accessed through UGC-Infonet programme and 5000 e-books and 5000 e-journals, 2 databases</td>
</tr>
<tr>
<td>8.</td>
<td>University of North Bengal</td>
<td>1,59,552 books and 742 print journals</td>
<td>e-books and databases accessed through UGC-Infonet, 5550 e-journals</td>
</tr>
<tr>
<td>9.</td>
<td>University of Gour Banga</td>
<td>Library is in developmental stage</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Aliah University</td>
<td>Library is in developmental stage</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>West Bengal State University</td>
<td>Library is in developmental stage</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Indian Statistical Institute (ISI)</td>
<td>129,000 books and 800 printed journals</td>
<td>700 e-books and 800 e-journals</td>
</tr>
</tbody>
</table>

**Agricultural Universities**

<table>
<thead>
<tr>
<th>No.</th>
<th>University Name</th>
<th>Library Resources</th>
<th>Access Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Uttar Banga krishi Viswabidyalaya</td>
<td>35,000 books and 35 print journals</td>
<td>e-collections are being developed</td>
</tr>
<tr>
<td>2.</td>
<td>Bidhan Chandra krishi Viswabidyalaya</td>
<td>69,460 books and 208 print journals</td>
<td>125 e-books, 175 e-journals and CeRA E-Resources Link (consortium)</td>
</tr>
</tbody>
</table>
Table 1: Universities in West Bengal

6. Definitions

- **Copyright**

Copyright grants exclusive rights to the creators of original literary, scientific and artistic works. Copyright only prevents copying, not independent derivation. Copyright protection begins, without formalities, with the creation of the work, and lasts (as a general rule) for the life of the creator plus 50 years (60 years in India and 70 years in the US and EU). It prevents unauthorized reproduction, public performance, recording, broadcasting, translation, or adaptation, and allows the collection of royalties for authorized use. Computer programs are protected by copyright, as software source and code have been defined as literary expression (CIPR 2002).

- **Fair Use or Fair Dealing**

Subject to certain conditions, a fair deal for research, study, criticism, review and news reporting, as well as use of works in library and schools and in the legislatures, is permitted without specific permission of the copyright owners. In order to protect
the interests of users, some exemptions have been prescribed in respect of specific uses of works enjoying copyright. Some of the exemptions are the uses of the work:

i. for the purpose of research or private study,
ii. for criticism or review,
iii. for reporting current events,
iv. in connection with judicial proceeding,
v. performance by an amateur club or society if the performance is given to a non-paying audience, and
vi. the making of sound recordings of literary, dramatic or musical works under certain conditions (Copyright Act, 1957)

- **e-resources**
  Resources that can be accessed with a computer. May be stored on CD-ROM (Glossary, National Library of New Zealand (1999)).

- **Gross Domestic Product (GDP)**
  The total market value of all final goods and services produced in a country in a given year, equal to total consumers, investment and government spending, plus the value of exports, minus the value of imports (Investorwords.com). GDP is commonly used as an indicator of the economic health of a country, as well as to gauge a country's standard of living.

- **Purchasing Power Parity (PPP)**
  An economic theory that estimates the amount of adjustment needed on the exchange rate between countries in order for the exchange to be equivalent to each currency's purchasing power. In other words, the exchange rate adjusts so that an identical good in two different countries has the same price when expressed in the same currency. For example, a chocolate bar that sells for C$1.50 in a Canadian city should cost US$1.00 in a U.S. city when the exchange rate between Canada and the U.S. is 1.50 USD/CDN. (Both chocolate bars cost US$1.00.) (Investopedia)

7. Importance of the Study

Let us find out why and how the present study is relevant and important for the other parts of the world. Presently world population is 7 billion (approx.) and out of this, 6 billion (approx.) people live in developing or less developed countries (PRB, 2011). The world is becoming knowledge economy where acquiring knowledge through higher education has become important than ever before. It is quite understandable that number of universities and total enrolment in higher education in developing countries is far more than developed countries. They are chronically underfunded but face escalating demand - approximately half of today’s higher education students live in the developing world (Task Force on Higher Education and Society, World Bank 2000). Characteristically universities in the developing nations including universities even in some European countries and in the Americas are of similar nature in terms of
poor infrastructure, under qualified faculty, outdated teaching-learning process, underdeveloped curricula, poorly taught students, substandard research, non-transparent university governance and administration. Besides other parameters like low Gross Domestic Product (GDP) and low Purchasing Power Parity (PPP) contributes positively to the negative qualitative growth of the universities in the developing world. Low GDP and low PPP of a country clearly indicate poor affordability to purchase or access learning resources by the higher education students of that country. Almost all universities in the developing countries suffer from the same features. Products of the existing academic system in the developing countries specially from India and China serving everywhere in developed countries. Thus it would not be incorrect to focus on the universities in West Bengal, a state of India, as a developing nation represent the universities of other developing countries as a sample. This is how the present study is relevant also for universities in the other developing world.

University as a system promotes and propagates scholarship through the ages. It creates knowledge and also makes the premise for future research. Creation of new knowledge in every frontier is essential for human civilization. Traditionally Indian culture from the ages of the Vedas has always been emphasised on the purity of knowledge. Purity of knowledge stems from purity of contents on which future knowledge creation is dependent. Academic honesty and integrity are equally important during the creation of knowledge. It is a very delicate issue on which usually university academic community do not feel very comfortable. But issues are so important that is directly connected with country’s economic development and potential impediment for becoming knowledge economy. Importance of the present study is that it has addressed the issue of fair dealing, academic integrity and copyright awareness among academic community in the universities of West Bengal as a representative sample of universities in the developing countries. It will surely help in identifying the points which must be redressed in order to bring well articulated and well defined copyright management policy in the universities of developing nations to promote and ensure quality of knowledge.

8. Literature Review

A primary mission of the University community is the exchange and development of ideas and information. This brings us into daily contact with the expressions of those ideas embodied in print media, audio and video media, and computer media, among others. Universities are the producers as well as consumers of such expression. Many of the works containing these ideas are copyright protected and the consequences of infringement can be quite serious, therefore, an understanding of the impact of the copyright laws on our ability to utilize these works is very important.

Copyrights at universities are no longer incidental niceties of scholarship; they are increasingly the result of massive investments in equipment and personnel, and they are the deed of rights to potentially lucrative creations (Peterson, 1985). Courts originally developed fair use to dismiss cases of minute or socially beneficial infringements, and the doctrine was largely a rule of reason; courts could excuse and infringement if it “reasonably” should have been allowed (Glenny and Dalglish, 1973).

It is easy to imagine that a system seriously out of balance either way would hurt progress in science and the arts; no protection for authors might mean that fewer would be willing to invest the time and energy to create works; total control for authors or publishers over their
works might severely restrict the public's use of the ideas contained in the works to develop new or derivative works or ideas. "Fair use" is the concept that provides balance between the two extremes (Harper 1993).

In the university context, however, fair use is intrinsically aligned with the notion that education deserves preferential treatment and should not be unduly inhibited. Fair use undoubtedly gives special deference to academic needs, although Congress and the courts have made clear that a non-profit educational purpose is no free license to appropriate protected works. Nor should it be. Any open-ended claim would eradicate scores of creative works that depend on copyright system for survival. Thus, fair use for education must be held to reasonable limits; within those limits a privilege for education is justified and indeed imperative for achieving copyright’s goals (Crews 1993).

The world of copyright ownership in the university is in flux. This is a recent development. Before 1987, most believed that scholars owned their creative works, even though they were made for the classroom or during working hours. By owning one’s creations under the “teacher exception,” a teacher had freedom to use the works at other universities, make alternations and new creations from the initial works, and occasionally reap profit from publishing textbooks or, in rare cases, monographs. Today, the growing trend is to see the “teacher exception” as created not by judge-made law, but by individual university policies. Universities decide what they want to own and what they give back to the scholar/teacher creator (Townsend 2003).

9. Methods

The academic community of the universities as a population is subdivided into 3 subpopulations. The subpopulations are overlapping, and together they comprise the whole population. Subpopulations in the universities are in the following:
1. Librarians
2. Teachers
3. Researchers/students

The subpopulations are called strata. For collecting data, it is more appropriate if we consider Stratified Random Sampling (Cochran, 2006).

Reason for choosing this sampling technique is many but principal ones are:
1. Administrative conveniences like subpopulations are geographically distributed over a long distance.
2. Sampling problems with human population.
3. Heterogeneous population consists of subpopulations that are internally homogenous.

As the study is targeted to test the hypothesis and the study demands precise analysis of target concepts, questionnaire (both online as well as offline) was employed to collect the numerical data. Another reason for opting quantitative method for research is that it is more efficient than qualitative data.

From each subpopulation 100 individuals are randomly selected and approached to respond to the questionnaire. Of them Total 171 Stakeholders responded to the questionnaire through personal visit, sending online questionnaire (using Surveymonkey Web Platform) through e-mail, and uploading into the college library website (http://librarybdc.webs.com/research.htm). Of them 35 are Librarians including Deputy
Librarians, Assistant Librarians (Grade I and II) and Information Scientists, 66 are University teachers including Professors, Associate Professors and Assistant Professors of Science, Arts, Commerce, Technology, Agricultural Science and Veterinary Science and 70 are Research Scholars/students in all the disciplines and University Students.

10. Result

There are 13 questions (table 2) in the questionnaire that were responded by the respondents.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Questions</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. *</td>
<td>Are you aware of fair use of the copyright resources (analog as well as digital)?</td>
<td>53</td>
<td>118</td>
</tr>
<tr>
<td>2. *</td>
<td>Do you share your soft copies of research article(s)/chapter(s) of a book or the whole book collected from your university e-library or digital library among your friends or others?</td>
<td>150</td>
<td>21</td>
</tr>
<tr>
<td>3.</td>
<td>The Government of India very recently introduced the Copyright (Amendment) Act, 2010 to comply with our International obligations and with the stated intention to making it fit for the purpose of digital age. Are you aware of it?</td>
<td>20</td>
<td>151</td>
</tr>
<tr>
<td>4. *</td>
<td>Do you use Copyrighted works for only non-commercial purposes like teaching-learning/research or not?</td>
<td>143</td>
<td>28</td>
</tr>
<tr>
<td>5.</td>
<td>Currently Fair Dealing only covers literary, dramatic, artistic, and musical works. Would you support the extension of fair dealing to cover computer programs, databases, sound recordings, film and broadcast?</td>
<td>98</td>
<td>73</td>
</tr>
<tr>
<td>6.</td>
<td>Do you support in the age of internet, you should be able to copy parts of a literary work, research article, parts of a news broadcast, film computer programs, databases and sound recordings?</td>
<td>162</td>
<td>09</td>
</tr>
<tr>
<td>7. *</td>
<td>Users should be able to copy the heart/core of a book or an article.</td>
<td>93</td>
<td>78</td>
</tr>
<tr>
<td>8.</td>
<td>Do you think there should be different laws for analog and digital resources and different laws should apply to their access?</td>
<td>133</td>
<td>38</td>
</tr>
<tr>
<td>9.</td>
<td>Users should be able to have a copy of a research article sent to his or her personal e-mail address rather than having to be present in the library or in the university.</td>
<td>155</td>
<td>16</td>
</tr>
<tr>
<td>10. *</td>
<td>Will you allow your books/research articles make publicly available in the web or using other means of broad dissemination?</td>
<td>41</td>
<td>130</td>
</tr>
<tr>
<td>11. *</td>
<td>Do you agree that to protect the interest of the copyright holder a library should monitor the material a user/researcher uses (even if the material is e-mailed, downloaded and accessed through his/her personal PC)?</td>
<td>42</td>
<td>129</td>
</tr>
<tr>
<td>12. *</td>
<td>Do you think sometimes it is needed to make multiple copies?</td>
<td>109</td>
<td>62</td>
</tr>
</tbody>
</table>
Here we consider 13 parameters for testing the hypothesis. But from the viewpoint of the hypothesis considering the few factors of fair use of copyrighted works, eight (marked with asterisk *) of them (assumed) are most responsible parameters. Factors of fair use are in the following:

- Factor 1 - Purpose of Use
- Factor 2 - Nature of Copyrighted Work
- Factor 3 - Relative Amount
- Factor 4 - Market Effect
- Factor 5 - Intention

11. Analysis

We consider all parameters but mainly zeroed in on only those parameters/factors which are most suitable one for our purpose. For this we use one proportion test for each of the parameters.

Let p = Proportion of awareness of fair use of the copyright resources (analog as well as digital).

Null hypothesis, \( H_0: p \geq 0.5 \) (it implies that people are aware of fair use of the copyright resources) against alternative hypothesis \( H_1: p < 0.5 \). For this we use well-known statistical software (MINITAB version 13) and after computation we see that Sample proportion = 0.309942 and \( p \)-value<0.05. Hence we conclude that awareness of fair use of the copyright resources (analog as well as digital) is not so popular among the academic community of the university. Similar deductions (table 3 and 4) are applicable to the rest of the parameters.

**Table 2: Questionnaire**

<table>
<thead>
<tr>
<th>Parameter Description</th>
<th>Questionnaire</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. * Do you have a well-defined Access Management Policy and Copyright Management Policy in your university in order to stop all kinds of plagiarism and to retain academic integrity leading to academic excellence?</td>
<td>02</td>
<td>169</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Parameter</th>
<th>Null Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. *</td>
<td>Proportion of awareness of fair use of the copyright resources, ( H_0: p \geq 0.5 ) against alternative hypothesis ( H_1: p &lt; 0.5 ).</td>
</tr>
<tr>
<td>2. *</td>
<td>Let ( p ) = Proportion of sharing of soft copies. Null hypothesis, ( H_0: p \geq 0.5 ) against alternative hypothesis ( H_1: p &lt; 0.5 ).</td>
</tr>
<tr>
<td>3.</td>
<td>Let ( p ) = Proportion of Awareness regarding Copyright Act/Amendment. Null hypothesis, ( H_0: p \geq 0.5 ) against alternative hypothesis ( H_1: p &lt; 0.5 ).</td>
</tr>
<tr>
<td>4. *</td>
<td>Let ( p ) = Proportion of use of copyrighted works for non-commercial purposes. Null hypothesis, ( H_0: p \geq 0.5 ) against alternative hypothesis ( H_1: p &lt; 0.5 ).</td>
</tr>
</tbody>
</table>
5. Let $p=$ proportion of preference of extension of fair dealing to e-resources  
Null hypothesis, $H_0$: $p \geq 0.5$ against alternative hypothesis $H_1$: $p < 0.5$.

6. Let $p=$ proportion of support for partial copying for e-resources  
Null hypothesis, $H_0$: $p \geq 0.5$ against alternative hypothesis $H_1$: $p < 0.5$.

7. * Let $p=$ proportion of preference to copy core of a book/article  
Null hypothesis, $H_0$: $p \geq 0.5$ against alternative hypothesis $H_1$: $p < 0.5$.

8. Let $p=$ proportion of support for different laws for digital or e-resources  
Null hypothesis, $H_0$: $p \geq 0.5$ against alternative hypothesis $H_1$: $p < 0.5$.

9. Let $p=$ proportion of users like to have a soft copy of e-resources  
Null hypothesis, $H_0$: $p \geq 0.5$ against alternative hypothesis $H_1$: $p < 0.5$.

10. * Let $p=$ proportion of users likely to make their intellectual works available in the web/other means of free dissemination  
Null hypothesis, $H_0$: $p \geq 0.5$ against alternative hypothesis $H_1$: $p < 0.5$.

11. * Let $p=$ proportion of users likely to monitor their activities for e-resources access/uses  
Null hypothesis, $H_0$: $p \geq 0.5$ against alternative hypothesis $H_1$: $p < 0.5$.

12. * Let $p=$ proportion of users think making multiple copies is sometimes needed and its distribution  
Null hypothesis, $H_0$: $p \geq 0.5$ against alternative hypothesis $H_1$: $p < 0.5$.

13. * Let $p=$ Proportion of universities have access management policy and copyright management policy  
Null hypothesis, $H_0$: $p \geq 0.5$ against alternative hypothesis $H_1$: $p < 0.5$.

Table 3: Parameter-wise Null Hypotheses

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sample Proportion</th>
<th>p-value</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. *</td>
<td>0.309942</td>
<td>p-value&lt;.05</td>
<td>Users are not aware of fair use of the copyrighted works</td>
</tr>
<tr>
<td>2. *</td>
<td>0.877193</td>
<td>p-value&gt;.05</td>
<td>Users like to share their e-resources</td>
</tr>
<tr>
<td>3.</td>
<td>0.116959</td>
<td>p-value&lt;.05</td>
<td>Users are not aware of any Act/Amendment</td>
</tr>
</tbody>
</table>
Table 4: Parameter-wise p-value and inferences

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>p-value</th>
<th>Inferences</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. *</td>
<td>0.836257</td>
<td>&gt;0.05</td>
<td>Copyrighted works are used for non-commercial purposes</td>
</tr>
<tr>
<td>5.</td>
<td>0.573099</td>
<td>&gt;0.05</td>
<td>Users favour fair use of e-resources</td>
</tr>
<tr>
<td>6.</td>
<td>0.947368</td>
<td>&gt;0.05</td>
<td>Users support partial copying of e-resources</td>
</tr>
<tr>
<td>7. *</td>
<td>0.543860</td>
<td>&gt;0.05</td>
<td>Users like to copy core of a book or an article</td>
</tr>
<tr>
<td>8.</td>
<td>0.777778</td>
<td>&gt;0.05</td>
<td>Users want different laws for e-resources and its access</td>
</tr>
<tr>
<td>9.</td>
<td>0.906433</td>
<td>&gt;0.05</td>
<td>Users like to own a copy of e-resources</td>
</tr>
<tr>
<td>10. *</td>
<td>0.239766</td>
<td>&lt;0.05</td>
<td>Users disallow/dislike to make their intellectual works publicly available in the web or other means of free dissemination</td>
</tr>
<tr>
<td>11. *</td>
<td>0.245614</td>
<td>&lt;0.05</td>
<td>Users do not like their access and use monitoring by the library</td>
</tr>
<tr>
<td>12. *</td>
<td>0.637427</td>
<td>&gt;0.05</td>
<td>Users want to make multiple copies sometimes</td>
</tr>
<tr>
<td>13. *</td>
<td>0.011696</td>
<td>&lt;0.05</td>
<td>Presently no University has any Access Management Policy and Copyright Management Policy</td>
</tr>
</tbody>
</table>

12. Discussion

From the above analysis of the resulted data, it is revealed that users of all categories are more or less equal in terms of copyright illiteracy. Very few of them are aware of fair uses of the copyrighted works and Copyright Act and subsequent Amendments. Though they have claimed that they use the resources for only non-commercial purposes but at the same time they likely to make multiple copies and its free distribution if the situation demands so. These two events are contrasting and their intentions are questionable. Users favour different laws for use and access of e-resources but in other hand they like to have own a soft copy of the e-resources for distribution and future uses. Users like to copy the core/heart of a book or an article but they do not want to share their intellectual works with others free of cost. Users do not want their activities (access/use of e-resources) are monitored by the library or by the
appropriate authority. No university in the present study has either any well-defined Copyright Management Policy or any Access Management Policy for the encouragement of intellectual works, to restore high level of academic integrity and to combat plagiarism among academic community of the universities. Questions were intended for cross checking and designed to get corroborating evidences from the responses. It has showed very disturbing trend and not conducive for the promotion of scholarship, academic honesty and integrity and highly discouraging for the creators and innovators.

13. Conclusion and Recommendations

In the conclusion, it can be said that our primary hypothesis is completely rejected on the basis of above test and study. Thus we can say that copyrighted resources (both analog and digital) are being used in the universities in West Bengal without maintaining the principles of fair use practices. Presently there is no Access Management Policy and Copyright Management Policy in any University under the study. Thus it is highly recommended that academic community in the universities are made aware and literate about the copyright acts, specially to comply with the principles of fair use practices for the promotion of academic integrity, scholarship and to reward the creators and innovators. Users must be educated and make them understand that with the inception of ICT and the revolution of internet and communication technology the conception of purchase of print (analog) resources are being replaced by the access and thus there must be Well-defined Access Management Policy in the Universities based on the principles of fair use practices.

To make a balanced copyright management and access management policy in the universities few other socio-economic factors of that nation must be considered otherwise the present situation will not improve. Universities should be well funded to promote copyright culture as poor affordability in the developing parts of world is one of the main factors of non-compliance of copyright. Degree of copyright compliance should be based on the economic conditions of the concerned country. It cannot be equated with the developed countries. International copyright laws, acts, treaties must be amended accordingly and should give equal opportunity of learning through equal access to the quality content among the higher education students of the developing nations. Universities may explore several paths to generate and collect fund to feed its research and other intellectual works.

Finally like in West Bengal, universities in the other developing nations need to design a well-defined Copyright Management Policy as well as a judicious funding policy, considering the holistic approach to improve the present situation, to combat the rampant plagiarism and to promote healthy copyright culture among the academic community.

References


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Abstract

Information is being generated at blistering pace from all the directions in varied forms and for all the themes. In addition, technology has opened new vistas to a wide spectrum of information with the recent advances in contemporary networking and multimedia technologies. Libraries and information centres now stand at the brink of a new frontier, where the flow of information is sweeping. Current developments have paved ways for the availability of scholarly information in electronic form called as electronic journals. Various other names given to electronic journals include E-zine, electronic periodicals, online journals, electronic publishing, electronic serials, Cyberzine, Webzine, Networked journals and E-journals. Electronic journals play an imperative role in the distribution of prime information and are available electronically via web. These journals have emerged as global information highways and are being added to library collections at exponential rates. Libraries are doing extensive work to make electronic journals available to their users at their desktops. Thus, the decisive link in keeping the user abreast with latest developments in their field of interest is electronic journals.

Keywords: E-Journals; Access management of e-journals; Acquisition of e-journals.

UNDERSTANDING E-JOURNALS

Electronic journals have been described in various ways in the available literature. One of the earlier explanations of the concept of electronic journal is given by Shackel (1982) as, one which involves using a computer to aid the normal procedures whereby an article is written, reefed, accepted and published. It also engrosses the help of suitable software for the users to
access the text at their computer terminals. Lancaster (1995) also defined that an electronic journal is one created for the electronic medium and available only in this medium. Rowland & Jagtar singh (1998) gave quite comprehensive definition of an electronic periodical as something that appears at regular intervals, is distributed electronically and is not restricted to a closed user group, has an identifiable title and editor(s), and contains discrete items with named authors. According to Harrod’s Librarians’ glossary (2005), an electronic journal is “a journal which is available in electronic format; a physical, printed version may also be available”. For the purpose of this study, electronic journals may be defined as any peer-reviewed, serial publications that are digitally created and stored in electronic form in a database for the purpose of delivery and retrieval electronically through various communication media for either networked access (through the Internet) or offline access (through the CD-ROM or floppy disk etc) in various formats like HTML, PDF, text, Postscript etc.

If electronic journal is viewed in relation to their print counterparts, two forms can be identified (Rowley, 2000); journals that are published in print form are made available in digital form and secondly, electronic only journals, which can be managed by an editor and there is generally no need of a publisher. There are different forms of print plus electronic versions as reported by Harter & Kim (1996). In some cases, there is co-existence of electronic as well as its print version while in others print version is replaced by the electronic journal. Sometimes electronic journal does not actually represent the print version and gets value addition, but continues to coexist with print. In addition, there is print version plus abridged e-version; besides there exist a late e-version than its print equivalents or e-version first and then print form; also occasionally there are electronic journals with a facility to supply individual articles in print form. Electronic only journals are also called as neo-
journals and these may be distributed freely over the Internet. Usually journals have a separate ISSN for e-version.

Electronic journals have matured with the growth of the Internet and accepted by library fraternity to be the integral part of library collections. Contemporary scenario is very congenial for the growth of electronic journals supported by the users’ demand for more e-content. Users are paying acute attention to formerly arcane electronic environment to grab the amenities available through it in having expedited access to meticulous and pinpointed scholarly content. Because of the several value-added features of electronic journals, these are becoming the foremost choice of academic library users.

Prior to the Internet, electronic journals were made available to subscribers by offline means like floppy disk and the CD-ROM or stored on mainframe computers and remote access was provided through dial up connections. Various other means of distribution of electronic journals included e-mail, listserve, file transfer protocol, telnet, gophers etc. The progression in the Internet and the WWW has enabled easy access to electronic journals that was previously difficult to obtain. These techniques have also facilitated incorporation of a few novel features, which are unique to the web environment such as hypertext and hypermedia linking. Hypertext has emerged as a way of pointers for linking within the text or to some other electronic text and hypermedia to provide links to other forms of media like animation, graphics, video clips, and audio material that cannot be incorporated in print form. The idea is to navigate the text, supported by multimedia, in a way that is desired instead of reading the text in linear fashion as in a paper format. Graphics could take the form of a interactive mathematical chart thereby adding value to text. At times, the electronic article can also take the form of a ‘living article’ which could show the results of an ongoing experiment and is frequently updated.
Electronic journals offer many opportunities to the users nowadays, which were not available to their predecessors. The foremost one is their rapid publication because all the formalities of peer reviewing, compilation, distribution etc are carried out through the channel of the Internet. These have also emerged as a solution for many problems associated with access thereby allowing remote access, rapid access, desktop access, multiple access and concurrent access. Moreover, electronic journals can be accessed round the clock (24x7x365) by eroding geographical barriers and as many articles can be downloaded and printed simultaneously by many users. The prerequisites for access across the space and time boundaries include compatible software; browser services; access rights and permission. As far as the accessibility is concerned, one good thing about electronic journals is that they are never at the bindery, never out of place (Gabriel, 1998). Therefore, it brings economy by saving binding expenses and maintenance charges of wear & tear. Publication and delivery of electronic journals is quicker and without the delays inherent in printing and postal delivery. Since the delivery of articles is in electronic format, the detection of error, if any, can be rectified with great immediacy. It also facilitates prompt annotations or observations by scholar community, thereby fostering online exchange of ideas. Other than that, electronic journals provide the users with tremendous searching capabilities by making possible the search across the whole text, title and even abstract of the article. One more benefit of electronic journals is that these do not utilize any large shelf space of already crowded library stacks. Therefore, one way to keep pace with the exponential growth in journal literature is being proactive in forms of electronic journals- the bundled knowledge.

The main disadvantage of electronic journal is that they relay on technology and special equipment for display and storage requiring capital cost of their establishment. Another shortcoming is availability of varying degrees of technological sophistication in electronic
interfaces, which can take for the users a long time to master. Even the convoluted steps in accessing the right information may be annoying for the non-tech savvy users. Training and practice to use electronic journals is required. One more complexity associated with the electronic journals is the back issue problem. Sometimes in order to preserve the appearance of the printed page in the electronic form (i.e. page integrity); publishers frequently use commercial software such as Adobe Acrobat, which requires users to maintain a viewer program on their own machine. Such software provides for proper reproduction of tables, mathematics and extended character sets, which may be difficult to achieve with the free and open-source software (FOSS).

MANAGING ELECTRONIC JOURNALS

Ideally, electronic journals have provided a solution to all the problems associated with print journals and developed as an accepted means of scholarly communication at global level. But no major development comes without issues and challenges to handle. The focus of present libraries is to look for tools to efficiently organize and manage the digitized journals because electronic journals too need to be selected, acquired, catalogued, make available and archived. Handling of printed journals involves well-established practices (Meadows, 1997), but presently the transition from print to electronic journals is occurring at a fast pace. Electronic journals must be scientifically managed to support the key mission of the institute as former being quite expensive requires an enormous financial investment. One major issue in electronic journal subscription is difficulty in developing and maintaining exclusive electronic journal holding as either the electronic journals are subscribed in juxtaposition with the print journal or as part of aggregated database that includes many titles not previously held by the library or by linking to new electronic journals that are available only in electronic format.
The concept of electronic journals is relatively new for libraries of developing countries, involving items that are not tangible in nature. These are not owned or held by the libraries rather accessed through interconnected networks. In addition, there are plethora of electronic journals accumulated by the libraries and made available to the users but there are some issues pertaining to organization and management of electronic journals, that must be given due consideration.

There are two fundamental aspects of managing electronic journals effectively (Breeding, 2004)

- Back-end Acquisition Task
- Front-end Delivering Access

ACQUISITION OF ELECTRONIC JOURNALS

Acquisition is a prime activity for collection development of electronically generated journals. Present scenario is quite different from the traditional acquisitions as it is possible that not even a single electronic journal is owned by or housed at the library rather these are accessed through remote databases. Therefore, for electronic journals acquisition refers to purchasing of access rites. Some new challenges that are to be confronted for acquisition of electronic journals include preferred pricing model; subscription schemes; ordering procedure; apprehensions of various acquisition approaches including consortia purchasing etc.

Pricing Models: There are no universally accepted pricing models for electronic journals as pricing strategies varies from publisher to publisher and these are made available through the Internet at varying pricing models. On the basis of the cost involved in subscribing to e-
journals, these broadly falls under two categories

- **Free Electronic journals:** A number of electronic journals are available freely on public domain and are not dependent on a subscription from a publisher or membership of an organization, so also described as open access journals. There are literally thousand of electronic journals, which offer high quality information totally free of charge (e.g. DLib Magazine, Bulletin of American Mathematical Society). These are often in receipt of funding from some organization or society and exist to promote the free flow of information in their chosen subject area.

- **Paid Electronic journals:** Also called as commercial journals. All the commercial journals require subscription to view their contents. There are many players for producing such kind of electronic journals such as traditional commercial publishers or scholarly societies or institutions of higher learning.

On the basis of various subscription schemes as provided by the service providers, these can further be subscribed in following forms:

- **Coupled with Print:** In most of the cases access to electronic version is tied to the subscription of the print journal. It may be either free with the print subscription (e.g. ASCE) or priced at a fixed percentage of the print subscription (e.g. IEEE package). Many publishers have started offering electronic versions of their journals almost at the same price as that of the print. Site licenses of such individual titles are negotiated directly with the publisher. These are equivalent versions of print journals e.g. Elsevier, Blackwell, Wiley etc.
➢ **Bundled Journals**: Sometimes publishers provide access to the entire range of electronic journals and other publications bundled into one (e.g. ACM Digital Library). Access to individual titles is not permissible.

➢ **Aggregators**: These provide an integrated environment to present access to and retrieve information from a number of publishers. So, aggregators are the service providers, comprising a collection of full-text electronic journals, which are packaged and made accessible through a single user interface having comprehensive search systems. E.g. EBSCO and Proquest. The platform may be either publisher-based or dedicated to a particular subject in the form of Subject Clusters. Some aggregators provide access to a stable list of titles whereas some frequently add or delete journals to their lists.

➢ **Big deal**: This term used by Frazier in 2001 to illustrate the deals in which electronic access is provided to a large package of journals from a publisher at a heavy discounted price. The drawback of big deal is that there is no option of selecting the titles so a substantial portion of such collection may not be of any use for the library e.g. Subscription of ScienceDirect from Elsevier.

➢ **Second Party e-journals**: Second party electronic journal databases are different in the sense that in this kind of database the entire journal is collected. For example, JSTOR makes available back issues of a wide variety of journals in electronic form. Other examples are INGENTA, Project MUSE, J-Gate of Informatics etc.

➢ **Flip Pricing**: Because of the increased preference for online content, librarians are negotiating on online-plus-print models rather than print-plus-online model. So, the core of negotiation is for online access. This is called flip pricing.

Based on the usage of the electronic journals, following pricing schemes are available in the
market:

- **Tiered pricing:** Payment based on number of potential users or the size of the institution.
- **Simultaneous access:** Campus wide access to subscribed journal is provided based on payment, which is proportionate to the number of simultaneous users who can access it (e.g. IEEE).
- **Pay per use:** Publishers have proposed a model where a user can search an online database and identify the articles of interest and pay for accessing full text of these articles. E.g. Dr. Dobbs Journal.
- **FTE Count:** Cost based per number of Full Time Equivalent students; students plus faculty; students plus faculty plus staff or alumni.
- **Virtual Journals:** Journals dealing on specific topics are grouped and access is provided to them. E.g. Journal of Electronic Publishing.

So, practically a library can opt for a combination of various pricing models from various publishers based on their economic viability.

**Acquiring approaches:** One of the easiest methods for acquiring electronic journals is through the traditional journal vendors. It is a very manageable option as all the libraries are used to this kind of acquisition. Otherwise, it is very cumbersome to place order to many different publishers. Placing order through a single or two vendors will reduce a lot of burden and the amount of correspondence will be diminished considerably. The other method is obtaining journals directly from the publishers or aggregators. Last but not the least and a very viable method in Indian scenario is Consortia purchasing for electronic journals. Evaluation of consortium for collective subscription of electronic journals has brought
revolution in the ways the information is provided to the users in academic libraries. It is very practical solution for subscription to electronic journals keeping in view the increasing costs of electronic resources. Consortia or buying clubs have been established in order to subscribe to electronic journals economically by sharing subscription cost based on number of member libraries. Consortia are supposed to offer access on the best terms and conditions. The larger is the membership base, the less is the subscription cost. Consortia purchasing often results in better pricing along with enhanced title access. With the emergence of consortium concept, the libraries in developing countries like India are at the verge of self sufficiency by endowing with electronic resources at deeply discounted prices. Consortia also help in providing a suitable platform for conducting training program for the staff.

**Licensing:** The idea of licensing to journal content is a new concept and a major area of concern for libraries. When libraries were subscribing to printed journals, they paid the subscription amount and got their issues/journals. These issues/journals were then owned by the libraries. The print journals can be bound, archived and used in many ways like kept on the shelves for the users to get needed articles in photocopy form or even lend for interlibrary loan etc. This makes their fair use within copyright law. At this point, the need of licensing the electronic content comes into picture because the electronic copy can be easily duplicated and distributed. It is important to restrict the access and thus licensing the information. Licensing is for providing access to the bona fide users of the library as libraries are no longer purchasing the journals. For subscribing to electronic journals, librarian has to send a request to the publishers or aggregators for online access by providing certain information such as name and place of the institution. The library has to enter a license agreement on the behalf of its users. A license is a contract between the publisher and the library, for the agreeable terms related to the electronic journals. This agreement includes various terms and
conditions such as restrictions on the use, copyright, warranties etc. Librarians must negotiate various terms and conditions mentioned in the contract and clearly understand their implications. Also decision must be taken on whether to access for restricted or unlimited number of users. Then the librarian has to sign up the site license agreement by sending registration form to the publishers. Some publishers accept online registration, whereas other insists on agreement in print form duly signed by the librarian. The whole process of signing the agreement and getting the site license, gives users the rights to access the electronic journals. Thus receiving the contents of electronic journal includes processes like registration, activation and authentication. Before the expiry of the agreement, the institutions concerned should renew their subscription to all the publications so that an uninterrupted access to the online version of the journals can be made available to the library users.

The licensing processes are complex; publishers transmit this information to libraries in a variety of paper and electronic formats, which should be studied thoroughly before entering into any contract. Hatua and Geetha (2004) consolidated some points to keep in mind while making licensing agreements:

- No. of users who can concurrently access the resources
- Availability of off-site access in addition to library on-site access.
- Manner by which off-site will be provide, i.e. method of authentication (confirming user identity) and authorization (matching user role with resources permissions)
- Ability to access information purchase if a subscription is suspended.
- Accumulation and dissemination of uses statistics.
ACCESS MANAGEMENT OF ELECTRONIC JOURNALS

Providing seamless access to electronic journals has always been the dream of librarians and involves various modalities even after budget allocation, selection of a particular title and site licensing. The steps include correspondence with the service providers like publisher, aggregator or consortium to get the access activated by any feasible method.

Earlier the publisher of electronic journals send the contents in the form of CD to various libraries, which were further cached in the local server for providing web-based access to full text articles to various users. In addition, there were times when the data files were copied directly from one computer to another thorough the TCP/IP protocols. With the developments of the Internet as a powerful medium of communication, the electronic journals were sent either through list serve or as an attachment via e-mail. But now as the web technology is advancing, websites and weblogs have emerged as the favorite medium of almost all the publishers for providing access to electronic journals. In spite of so many ways to provide access to electronic journals, majority of the libraries do not own the electronic journals that they subscribe to rather most of the electronic journals are mounted on remote servers in the form of websites or mirror sites. In a very rare case, publisher set up special sites at subscribing institutions.

Modes of Access:

Access to electronic journals is provided using a wide variety of access mediums to meet the users’ needs. Currently, various access methods are available such as Internet Protocol address activation or by password or using proxy server or VPN Software.

- **IP Activation:** Publishers generally provide access to electronic journals by activating
Internet Protocol (IP) address of the users’ computer. The range of permitted IP addresses for the institution’s site is conveyed to publisher for activation. It is always beneficial for the libraries to get activated only the static IP addresses. Any changes in the IP address should be notified to the publisher from time to time to avoid unauthorized access to electronic journals by unknown users and to provide seamless access to its own users. This type of access is very common and more convenient for most of the users. In this case users don’t have to obtain and remember a password but the problem associated with IP address activation is that the access will be limited to users at the institution level only. it is not possible for the users to access the electronic journals beyond the limitations of the campus and they are deprived of 24x7x365 access as usually conceived.

- **Password Access:** Password access gets over this problem, but sometimes there is possibility of unauthorized use of passwords. Therefore, some mechanism for user verification must be evolved so as to give the passwords only to the authorized users. Sometimes the login and password is provided to the semester students for one session and the password has to be changed for the new entrants. A number of software are used all over the world to facilitate remote access to the user.

- **Proxy Servers:** The technique being developed to solve the problems associated with the both the above methods, is to set up a gateway of proxy server. In this type of access, a unique user logon ID and password is given to users to access all the electronic journals. The access is provided through a temporary IP address and a single username is sufficient for accessing many online resources. This process also solves the problem of remote access. Another advantage of proxy servers is that the later will also keep a copy of the article downloaded (‘cache’ it) and will promptly fetches it if some other user requests it afterwards.
VPN Software (Virtual Private Networks): By installing VPN software at users’ machine, the institute’s server temporarily assigns an institutional IP address to that machine which is ten recognized as legitimate by the publishers website. But this kind of access is regulated by the provisions made in the license agreements only (Funk, 2003).

Delivering Access

Dissemination of acquired/accessible electronic journals is must for proper information retrieval. The users must be made well-versed with the available electronic journals and it may be done through different mechanism such as the library catalogue, library WebPages or by using commercially available electronic journal management software. To create a suitable user interface for dissemination of electronic journals is crucial prerequisite. Libraries may plan to present them either through online catalogues or through library web pages.

Library catalogue: Library catalogues are primary means of displaying a library’s collection. These act as a tool to provide comprehensive search capabilities with controlled subject vocabulary. Present generation libraries are available online to their users. Libraries can make electronic journals available to their users through OPAC. Classification and cataloguing are the twin tools to process the acquired electronic journals. For the purpose of their insertion into OPAC, electronic journals should be classified according to their subject coverage and then the entry is done in OPAC. Presently cataloguing module of most of the integrated library management software are capable of linking the URL of electronic journal with the bibliographic record. When journal URL is added in the electronic catalogue, it is possible for a user to get connected to an electronic journal directly through the catalogue. Su (1997) described
that library catalogues should provide equal access to traditional print serials and electronic serials in one integrated system. So, users do not have to make the same search in multiple systems. Catalogue records also provide content information which can help users to evaluate the resources before accessing, whereas indexing tools find a match and provide access only. Drawback of online catalogue is that many users like to browse electronic journals by titles, without having to do a title search in the catalogue every time.

- **Library WebPages:** An alternative to cataloguing include – web lists, context-sensitive linking and federated searching. Library web pages are special pages providing title browse list of acquired electronic journals along with their links. The portal technology has enabled libraries to provide the user with such an interface from where information of high relevance can be accessed with ease. Thus website is providing a proactive, user-oriented and service-oriented medium for presentation of electronic journals. The library’s website plays an important role in promoting and maximizing access to electronic journals. It is very easy for user to have access to all the electronic journals if library is consolidating their access on a single platform which is website. Electronic journals can be listed by subject disciplines, publishers wise etc.

Generally the links to electronic journals are provided on the library’s web site in the form of A-Z (alphabetical) list. But in my view, it is always logical to organize electronic journals by classifying them in subject or keyword-specific web pages as lengthy alphabetical listing of journals may lead to chaos and this will mar the very purpose of quick and efficient retrieval of information. Subject wise listings of electronic journals on webpage always add to easier browsing. Electronic journals can be listed by subject disciplines, publishers wise etc.
The advantage of library web pages over the search engines is that

- These provide linked accessed to acquired full-text electronic journals only.
- These pages are easy to navigate because of then standard format.
- These pages can help statistics for electronic journals use studies.

**Electronic Journal Management Systems:** Professionally developed journal management systems are quite helpful, as this management system does the work of providing links and customized journal titles list of the database. Electronic journals keep tract of titles available both in free collections or publishers’ site. This also helps in identifying the holdings of the library.

Thus primary means of providing access to these journals is by creating records for them in the library catalogue and providing links from the library’s website.

**PROMOTION OF ELECTRONIC JOURNALS**

Promotion means any activity which is done to foster awareness about the electronic journals and educate users the skills needed to use electronic journals. As electronic journals are developing as a new information platform, its promotional activities require something more than just notifications. Keeping users informed of the electronic journal is a big challenge.

When a sophisticated service in the form of electronic journals is introduced, promotion is the only factor which determines the effective use of the service. Traditional promotional activities include publicity through material like brochures, awareness programmes, presentations at seminars and conferences etc. In the digital era, promotional activities may take the form of announcements on the website, creating links to the library web pages from the institutional home pages, electronic training modules etc. There is a great need to organize periodic presentations by the library staff at the doorsteps of the users. This will help
the users to know the existence of electronic journals for their better and effective utilization. Activities like organization of staff-users meet, specialized presentations by electronic journals vendors, presentation by experts, presentation by the librarian, e-announcements should be the integral component of dissemination schema. Other activities include specialized presentations by electronic journals vendors, presentation by subject experts, and presentation by the librarians. E-announcements in the form of global e-mails or e-notice boards should be the integral component of promotional schema. E-mails can be sent to users to keep them aware of added facilities or added titles or any kind of changes etc. The concept is that user must be aware of the new format in which the information is available.

CONCLUSION

Library is a pivot of support for all the information activities of an institution. However, contemporary libraries are witnessing a shifting of paradigm from print to electronic journals followed by contraction of expenses for print journals This paradigm shift is having tremendous impact upon the management activities of libraries and the librarians are to confront with complex sets of challenges. Nisonger (1996) observed that “planning for electronic journals is like shooting a moving target”. But with dedication emerging challenges can be transformed to opportunities for the expansion of electronic journals. The entire process of managing electronic journals can be a learning one. Coherent management activities related to acquisition and access of electronic journals is the demand of the hour. Presently, it is almost obligatory for the librarians to plan a trouble-free access to electronic journals so that the users can find what they want with ease.
REFERENCES


E-RESOURCES COLLECTION DEVELOPMENT IN ENGINEERING COLLEGE LIBRARIES: A CHALLENGE FOR KNOWLEDGE CENTRE MANAGERS

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ABSTRACT
Knowledge centers are the repositories of the intellect of ages stored in the form of recorded information for use of present and future generations to come. Digital technology has made it more easy, speedy and comfortable to apply the stored intellect. This collected information through the ages has to be used for further research, betterment and overall development of the society. This paper describes various facets in collection development in a digital environment in the engineering college libraries. The various changes that have occurred in acquisition, retrieval and storage of information processes due to technological developments have been discussed. Limitations, issues, challenges restrictions and problems being faced by library managers and clientele due to the same have also been highlighted. The way these developments have affected the academic environment in general and engineering college libraries in particular, and changed the role of librarian has also been focused.

1. INTRODUCTION
We are all aware of the information explosion that has revolutionized the globe in the last four decades. But the advent of Information and Communication Technologies, the Internet and particularly the World Wide Web has changed dramatically every thing on the earth. The Libraries and Information Centers have gained a lot. These technologies have been a boon. A job that before used to take hours together, is now just a mouse click away. The publishers did not remain behind; they took advantage of these applications to a considerable extent and tapped a treasure house of electronic and web resources. This has created a thought on actual possession of resources to actual access of the same, thus creating a change in; the collection development in the electronic environment. The knowledge centers acquire electronic resources to support the various activities of the parent institution be it instruction and research. Librarians are making low budget and appropriate purchase decisions balancing both individual and institutional needs. The information scenario is changing at a faster speed. The reasons for this change are many. Library users increasingly demand resources in Electronic format because of its associated advantages (such as their simultaneous presence, faster search ability, easy manipulability and accessibility). More and more library staff is now at ease with ICT and is happy and are ready to explore the functionalities of the software/hardware to the maximum extent starting from the lower level, thanks to the rising rate of computer literacy. Library managers are also becoming active and creating alliances with the academics to design environments to integrate ICT into the new teaching and learning...
methods. The library & computing services are going hand in hand to support users. The remote users who want to access E resources from their homes, work places and while on the move is on rise. Universities and other places of higher learning are slowly developing institutional repositories where the information generated by its members, is archived, using appropriate softwares and made freely available worldwide, as far as possible. Publishers, vendors and agents are more aware of the developing market for electronic resources and are eager to supply electronic resources / services along with print based materials. Further, the World Wide Web (www) is an important versatile platform for the delivery of needed information and provides a basis for the shift from ownership of physical collections to access on demand. Web being a real time information delivery channel has made CD-ROM based delivery a reality. The shift is not only taking place within the knowledge centre but throughout the various facets of academics in a engineering college. This is because of the changes in syllabus structure, distance education provision and delivery of teaching though virtual classrooms, using the internet platform. However, current Library Management Systems adapted by our engineering college knowledge centers are not very helpful in the management of engineering electronic collections as they were primarily designed for print based resources and lack the capability to manage the vastly changing electronic resources. Dedicated Electronic Resources Access & Management Systems are now making their appearance in the market and some old all ready LMS’ are also adding Electronic Resources Management modules to their systems for up gradation. These new generation systems will also help in the shift from printed to electronic resources. Hence, to demands of users, libraries are shifting towards new media - namely electronic resources for their collection development.

As huge amount of money is spent on electronic resources, it seems justified that as library managers we examine the process we use for selecting such resources. Collection development policies and ordering processes for print collections have found a place in many, if not all, engineering college libraries. As the transfer from paper to electronic resources occurs, especially in the acquisition of serial titles, we feel it necessary to examine the various process we in particular and other academic libraries in general use to select various electronic resources.

2. ENGINEERING EDUCATION IN INDIA

Today in India there are more than 3393 Technical institutions with more than 1485894 intakes as per 2011 statistics. The Internet is an inseparable part of today’s engineering educational system. Engineering colleges invest a good deal of amount on providing this facility to both the teachers and students, who are the main stake holders.

Traditional library resources are insufficient to meet current requirements of users. The increasing online environment has resulted in users, who are more technology savvy and are demanding and expecting more from the library. The potential of delivering information anytime (24X7) anyplace challenges libraries to re-examine how space is organized and used. It is necessary to create new modes to deliver services to the user.
desktops even outside the campuses using the WWW platform. As more resources are created via the web, issues arise related to search & access the same. Users would like to see their library on the internet, able to meet their all information needs not only on demand but also in anticipation of demand. Besides this they would also expect to get comprehensive information on broader range of disciplines while a engineering college library could have good collection only in their specific discipline. Again it would be a big cause of users’ dissatisfaction. But to overcome this problem engineering college libraries may have to have more & more electronic resources which shall help to offer new and more qualitative services to their users.

3. E-RESOURCES

What are E-Resources?
Are electronic products that deliver a collection of data, be it text referring to full text databases, e-journals, e-books image collections, other multimedia products and numerical, graphical or time based, as commercially available title that has been published with an sole aim to being marketed and for information dissemination. These may be delivered on any optical media or via the Internet.

Why to procure E-Resources?
We would apt for procuring e-resources because of
• easy usability,
• readability,
• budgetary aspects
• and speedy accessibility
• easy back file access and in addition to these,

The following are the added advantages of e-resources over the print media.

• Multi-access: A networked product can provide multiple points of access (in the campus) at multiple points in time (24X7X365) and to multiple simultaneous users.

• Speedy retrieval: An e-resource is lot quicker to browse, to extract, and to integrate the information into other material and to cross refer between various publications.

• Functional aspects: E-resources will allow the users to approach the publication in order to analyze its content in various new ways and techniques by click of the mouse on search button.
• Content analysis: The E-resources contain a vast amount of information, but more importantly in a mixed format mode i.e. images, video, audio and animation which could not be replicated in print.
• Consortia mode: The E-resources can be subscribed in a consortia format too thus cutting down the costs but reaping the same benefits. Eg. INDEST Consortia for Engineering College Libraries
• Interactivity: Articles/issues/chapters can be read, commented by the readers, amended quickly and greater feedback can be given through the web
• Hypertext: format can be used and links to related articles, or other web sites, & URLs for individual articles and email alerts when latest issue/edition is uploaded can be got
• Virtual reality: Advantages taken on the web is to add value by using animation, virtual reality and interactive physical & mathematical charts.
• Flexibility: resources an evolved quickly i.e. they are not bound to any format, printer, and distribution network

Special Features of e-resources

E-resources have some distinct features which differentiate them from traditional resources. E-resources on the Internet are further distinct by the nature of the information on the net itself. The features of 21st century information and media are (Satija, 2003):
(a) High compact storage;
(b) Ease of reproduction, multiplication and manipulation and transmutation;
(c) Contents can be very easily detached from its media or container;
(d) Ease of migration of contents from one medium to another;
(e) Ease of transmission, communication and storage;
(f) Hypertext and multimedia;
(g) Seamless integration of print and electronic resources;
(h) Sophisticated and mulitpronged searches through keywords, free text, Boolean operators, lass numbers and natural languages processing;
(i) Wall less libraries leading to the vision of multimedia global virtual library (MGVL) inaugurating an era of “Death of distance”; and
(j) Convergence of technology, which is getting more powerful each day

<table>
<thead>
<tr>
<th>Traditional resources</th>
<th>v/s</th>
<th>Web based electronic resources</th>
</tr>
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<tbody>
<tr>
<td>Very well coordinated</td>
<td>Not very well coordinated</td>
<td></td>
</tr>
<tr>
<td>Substantial Authority</td>
<td>Not always systematically evaluated</td>
<td></td>
</tr>
<tr>
<td>Regular presentation</td>
<td>Structured presentation</td>
<td></td>
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<tr>
<td>More permanent</td>
<td>Versatile</td>
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<tr>
<td>Represented in secondary information services also</td>
<td>Not indicated in secondary information services</td>
<td></td>
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<tr>
<td>Compatible to information processing tools</td>
<td>Diverse nature makes it difficult for information Processing</td>
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<tr>
<td>-------------------------------------------</td>
<td>----------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Contains mostly textual and static images</td>
<td>Contains multimedia and interactive presentations</td>
<td></td>
</tr>
<tr>
<td>Time lag between generation and publishing is very high</td>
<td>Time lag is very minimum</td>
<td></td>
</tr>
<tr>
<td>Back file access very tough and tedious</td>
<td>Back file access very reliable and speedy</td>
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**Procurement trends for e resources**

Below are the new catching trends in acquiring e-resources:

a. E Books are electronic versions of printed books that can be viewed on PC connected to the internet (available as print on microform, audio tape, video tapes, CD-ROM and internet-based interface)

b. E Journals are electronic versions of print journals that can be viewed via the computer (they are available as online subscriptions, print + online subscription)

c. E-books - available as “chapter-by-chapter” basis that can be purchased based on the need

d. E-journals – available as “article-by-article” purchase, also based on the need

e. Available in formats like: Adobe PDF, Microsoft reader,
f. E readers are becoming the talk of the day with students being able to read them on their tablets, the govt. initiative namely the AKASH TABLET being supplied to the students at a nominal price is commendable and will surely boost the usage and procurement of e-resources

**Criteria for selection for e resources**

The following important issues should be taken into consideration while selecting an e-resource:

- Various number of databases offered,
- Search and retrieval facilities,
- Searchable graphic interfaces (simple and advanced user interface),
- Record formats,
- Cost factor,
- Cross reference queries
- Service & solutions in case of problem,
- Support & training services
- Additional facilities such as current awareness services, Selective dissemination of information
- Varied type of usage reports
4. COLLECTION DEVELOPMENT

Collection development is the selection, acquisition and processing of library materials in varied formats, meant for users' current needs and their future requirements.

What is E Resource collection Development?

The process of planning, selecting, acquiring a balanced collection of Library materials in a variety of electronic formats such as e-books, e journals, media and online resources.

Steps of E Resource Collection Development

- Selection and Deselection of current and retrospective e resources based on user needs
- Planning strategies for continuing acquisition of e resources looking into financial constraints and their usage
- Evaluation of e resources collections to determine how it serves users need

The transition from printed information to electronic publishing has greater impact on the following functions of a knowledge centre:

- Selection and maintenance of a common set of e resources for users
- Provision of convenient and intelligent access to subscribed e-resources.
- Maintenance of access to the e resource archives.

The form of documents received has changed from hard copy to electronic forms.

Electronic form of documents may include those in machine-readable form, CDs, and more popularly today, web based documents. The scope of these e collections being procured should therefore include the following factors:

- subject content
- exposition level
- document form
- resource type
- accessibility
5. PROPOSED MODEL FOR COLLECTION OF ENGINEERING RESOURCES

6. SOME ISSUES

Culture Change:
Knowledge center managers have become more aware of technology and technical issues, while the technical personnel have developed better service orientation. Although academicians now have the facility to read their required content in the privacy of their own offices, on their own desktops, they still resist canceling print subscriptions. This is the case even with the regulatory bodies. They too insist on hard copies making them almost mandatory.

Organizational Structure:
The delivery of e-resources depends on the network infrastructure, hardware, software expertise, internet speed as well as the information management softwares to provide the best service. To bring all this under one umbrella, computing and library services have been restructured several times to ensure they provide speedy and timely service.

Access:
One of the major issues with regards to e-resources is the nature of user interfaces they use and the diversity of resource formats (e-books, e-journals, databases, blogs etc). This
has required library managers to develop their skills in traditional and technical ways to provide integrated access to resources through the library catalogue and develop HTML skills to provide access through the subject web pages as well as perform their traditional routine duties which is a burden on them. As well they have to train their staff for this purpose or keep separate staff for this purpose, but in his absence the work will be hindered.

**Administration and Management:**
Unlike the print versions which are static, e-resources are dynamic in nature and require more maintenance. The traditional Library Management Softwares (LMS) are unable to deal with the e-resources. Further e-resources, particularly e-journals require high maintenance along with their archival. Changes occur to the journal packages or the package interfaces on a regular basis and while we are trying to control the situation somehow these changes are sometimes missed. This constant change of urls, user guides and holdings information is extremely time consuming for staff to update. Publishers generally limit access to e-resources by password or Internet Protocol (IP). But the IP access presents problems for home users where as separate passwords for each product becomes unmanageable.

**Archiving:**
Uncertainty prevailing regarding the availability of information after termination of subscription termination, may be due to financial constraints or non usage of the resources, is the biggest drawback to build e-resources collection. Therefore, we have no option but to continue subscription to hybrid formats both print & electronic thus adding to the shrinking budgets. The users are also not ready to move to e-journals and cancellation of print version, the reasons for which are not known. Although library managers strongly prefer e-journals with back files, but the choice is very limited with regard to the users. Archiving issues appear to be a major problem their as what to archive and what not to archive.

**Concerns and issues on SELECTION of e-resources**
Selection becomes complicated because of some special problems such as:

i. Administrative & operational costs.
ii. Vendor reliability
iii. Hardware and software requirements.

**Issues to consider not associated with printed formats:**
- Differences in different modes of access (like networked access, remote access, campus access, stand-alone access, etc.)
- Cost options (subscription costs, hardware & software costs, etc.)
- Authorization to remote loggers (by IP address, password based, etc.).
- Maintenance and up gradation of resources can be expensive.
- More Service support needed in areas of staff and user training, documentation, and troubleshooting, especially with remote services.
7. THE CHALLENGES

The challenges of integrating e-resources and technologies into the process of collection development in an Engineering college Knowledge Centre are many, varied, and multi-faceted. Beyond considering the selection process itself, there are many issues to consider such as budget constraints, collection development policy, well trained staff, and ever-changing versatile technology. Most common being shrinking budgets and increasing operating costs. Collection budgets are at special risk because they are not directly connected to the number of staff positions or level of user services (Otero-Boisvert, 1993). Academic libraries have been affected by the impact of electronic technologies on research, such as increasing demands for electronic searching capabilities, demands for access to machine-readable scholarly texts, and use of network discussion groups for scholarly communication (Shreeves, 1992).

The E-resource collection development areas that seem to be the most problematic are

- Selection of the e resources,
- Acquisition of e resources,
- And inter-institutional cooperation.

Two issues in the discussion in this context are:

1. the shift in library philosophy from ownership of locally stored resources to provision of access to electronically stored resources;
2. And the need for rethinking collection development policy, both to support the new philosophy and to better deal with new types of resources on a timely basis.

Librarians are confronted with the following issues too with reference to E resources:

- Quality of the product
- Technological obsolescence
- Access (licensing)
- Copyright issues
- Trained manpower
- Data migration
- Ownership
- Archiving problems

Problems of E resource Collection Development

(1) Problems of user-friendly environment
(2) Problems of user training
(3) Problems of Digital Divide
(4) Problem of library Classifications
(5) Problem of Staff Development Approach.  
(6) Problem of Complicated procurement and preservation system  
(7) Problems regarding Technological Up gradation  
(8) Problems regarding financial constraints for collection development  
(9) Problems regarding IT skill Manpower  
(10) Problems of user service  

E resource Cost factor:  
E-resources costs come under three varied categories:  
1) **Equipment and network infrastructure costs**: requirements for equipment (PC, printers) and network infrastructure have evolved over the years. So some knowledge centers have introduced three year PC replacement cycle and installed high speed (Gigabit) network to meet growing demand. A considerable amount of funds have to be devoted to implement new technologies as and when they become available.  
2) **Staffing, training & development**: Since e-resources are complex to manage, dedicated and well trained staff has to be assigned. Developments in the e-resources market & technology are happening so fast, that there is a need for continuous staff training & professional development among librarians and computing specialists. The head Institution & Library has to invest considerable funds in staff development. However, there are some savings on staff time by moving to e resources.  
3) **Costs of Subscriptions**: E-resources are often costlier than their print equivalents because in some countries like UK, libraries also have to pay 17.5% VAT in excess of journal prices.  

**8. SOME SUGGESTIONS**  

**Be Proactive**  
Librarians need to be proactive in making Engineering e-collection decisions.  

**Develop an E-Collections CD Policy**  
A collection development policy is highly recommend for developing Engineering e-collections  

**Get Input from All Stakeholders**  
Engineering College Students and Faculty are to be engaged in the process as they are the ultimate users of there Resources.  

**Develop Criteria**  
We need to develop specific criteria for adding and canceling Engineering e-resources
9. CONCLUSION
Long term predictions are difficult to make due to dynamic nature of e-resources market and due to the advent of Open Access Movement. As the world of information continues its march towards the electronic format, librarians need to be more careful in how we are handling our e resource collections. Librarians would never consider adding a significant collection of Engineering printed books or journals without a thorough review process. Yet it appears that we often add electronic content without a rigorous review process, in the process we are adding some unwanted information also which may never be used but still will be in the server thus occupying space and money. This will have to change. Librarians need to treat selected Engineering e-content like printed content by developing a set of standards to manage Engineering e-collections.

Electronic resources are creating a revolution in engineering college libraries. Many librarians believe that these resources have changed the principles of selection radically; some believe that they will virtually eliminate selection. Although, it is true that the art of selection is undergoing profound change, the selection of resources is still crucial for libraries & Knowledge Centers. The four basic criteria for selection - quality, library relevancy, aesthetic and technical aspects, and cost remain the same in the digital era of information. What they mean and how they are used has changed. Though the electronic resources offer ease of use, wider access, more rapid updating, cost saving over local maintenance and storage, the librarians are finding it difficult to define issues related to policy of Collection Development and Archiving of these Electronic Resources. The electronic resources require continuing management to a far greater degree than print resources do is an accepted fact.

Engineering E Resource Collection Development includes everything that goes into acquiring materials, including selection, ordering, and payment. It is a chain of events that includes planning, administration, and control. Engineering E Resource Collection development serves as a foundation upon which other library services are built. Librarians at present are more concerned with collection management than collection development. They are acting increasingly as interpreters of information, rather than as selectors. They have to act as “E Resource knowledge managers” rather than “collection managers”.

10. BIBLIOGRAPHY


13) ELECTRONIC RESOURCES: COLLECTION DEVELOPMENT By Maya Avasia*


WEB 2.0 ENVIRONMENT AND ITS IMPACT ON LIBRARIES AND INFORMATION SERVICES

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ABSTRACT
The web was widely embraced by academia and librarians recognized a great information delivery system. The term Web 2.0 indicates the development of online services that encourage collaboration, communication and information sharing. It also represents a shift from the passive experience or read only web pages to the participatory experience or read write web pages. Web 2.0 services as forums, wikis, RSS, blogs, podcasting, video sharing, social networking, instant messaging, tagging and social bookmarking, etc. are increasingly embedded in many areas of life. Similarly, it is also used in all over the world to promote information services by librarians. This paper describes background, concepts, features, three icebergs (threats) and key applications of Web 2.0 services in libraries. Finally, it also highlights the impact of Web 2.0 on libraries and information services.

Keywords: Information delivery system, Web 2.0, Online services, Communication and information sharing, Libraries, and Information Services.
INTRODUCTION

The World Wide Web has undergone another radical transformation over the past years. Due to the integration of social web, web application and technology, a new web environment (Web 2.0) came into existence.

Social Web + Web Application + Technology = Web 2.0

As the latest technology tool, search was exhilarating, informative-and dramatically changed the way people looked for information. Just ask librarians! A record 6 billion searches were conducted on search engines in January 2006. In Web 2.0, the web becomes the center of a new digital lifestyle that changes our culture and touches every aspect of our lives. The web moves from simply being sites and search engines to a shared network space that drives work, research, education, entertainment and social activities—essentially everything people do. You and your mobile and non-mobile devices—PDA, MP3, laptop, cell phone, camera, PC, TV, etc. are always online, connected to one another and to the Web. The first traces of Web 2.0 are already appearing. Consider the roaring success of sites that embody Web 2.0 principles of simplicity, rich interactivity, user participation, collective intelligence, self-service, novel and remixed content—Flickr, MySpace, Facebook, del.icio.us, YouTube, Library Thing—to name a few. The potential effects of Web 2.0 have not gone unnoticed in the library community (Storey, 2006).
CONCEPT AND DEFINITION OF WEB 2.0

The term Web 2.0 was officially coined in 2004 by Dale Dougherty during a team discussion on a potential future conference about the Web (O’ Reilly, 2005a, in Anderson, 2007). It has brought a dramatic change in the use of Internet and offers us several tools and services that allow easy interaction and participation to all users. Thus, O’ Reilly (2005) observes that the change in the web environment has evolved personal web-pages into blogs, encyclopedia into wikipedia, text-based tutorials into streaming media applications, taxonomies into folksonomies, and question-answer/e-mail customer support into instant messaging services. The implications of this revolution in the web are enormous. Web technologies let users work in the Internet cloud as they work on their own desktops and get the advantage of a collaborative culture in creating the value. Software engineers have used this Web 2.0 ecosystem for their value multiplications (Serrano and Torres, 2010).

Web 2.0 concepts have led to the development of web culture communities and hosted services. Similarly, Web 2.0 not only means new technologies, it also brings a fundamental change in how libraries operate. It offers diverse ways to add value to library services and also represents a shift from the passive experience of static “read only” web pages to the participatory experience of dynamic and interactive web pages.

Web 2.0 Technologies are technologies that transform the Web into a platform spanning all connected devices. They enable the creation of web-
services and applications, constructed from lightweight models, and can be used intuitively.

The principles of Web 2.0 are also applicable to libraries and this new scenario is playing a proactive role in changing the behaviour of ‘providers’ and ‘users’ of information. Librarians and information professionals need to consider the new mindset of users and transform their library and information services accordingly. With the advent of the ‘Web 2.0 age’ users can do a lot for libraries such as creating additional information and content and generating knowledge. Thus, the benefits of Web 2.0 environment can be considered reciprocal. These two examples show this cultural change:

1. Library of Congress offers opportunity to users to tag digitized photos through Flickr (Library of Congress).
2. The scientists have suggested to ‘wikify’ if the researchers discover inaccuracies in the database, they should be allowed to append corrections (Miranda, Gualtieri and Coccia, 2009).

FEATURES OF WEB 2.0

Andrew McAfee (2006) used the acronym SLATES to represent the Web 2.0 features/techniques:

- **Search**: the ease of finding information through keyword search that makes the platform valuable.
- **Links**: guides to important pieces of information. The best pages are the most frequently linked to.
➢ **Authoring**: the ability to create constantly updating content over a platform that is shifted from being the creation of a few to being the constantly updated, interlinked work. In wikis, the content is iterative in the sense that the people undo and redo each other’s work. In blogs, content and comments of individuals are posted and accumulated over time.

➢ **Tags**: categorization of content by creating tags that are simple, one-word descriptions to facilitate searching and avoid rigid, pre-made categories.

➢ **Extensions**: automation of some of the work and pattern matching by using algorithms e.g. amazon.com recommendations.

➢ **Signals**: in RSS, users are notified about any change in the content through e-mails.

**LEAD THE LIBRARY BOAT INTO THE WEB 2.0 ENVIRONMENT**

According to Anderson (2006), librarians work hard, with the best intentions, to serve our users well in a world that has changed dramatically in the last decade. If the profession is a boat, then librarians are all rowing pretty heroically. But enough attention would be paid to avoid the potential disasters that lie in our current path. In particular, there are three “icebergs” which pose significant threats to our future success. All are remnants of a bygone information age, practices and attitudes that no longer make sense but which we librarians have difficulty letting go. The library users have no such qualms, of course, as the emergence of Web 2.0 demonstrates.

➢ **“Just in case” Print Collection**: Building a comprehensive collection of materials that anticipates the user’s every need has always been
problematic, but it was an approach that made sense when information was available only in print formats. In the University of Nevada library, 55 percent drop in circulation rates over the past 12 years was observed, making it harder to justify the continued buildup of a large “just in case” print collection. As a Web 2.0 reality continues to emerge, libraries users expect access to everything-digital collections of journals, books, blogs, podcasts, etc. Librarians think users can’t have everything? Think again. This may be great opportunity for librarians.

➢ **Reliance on user education:** Libraries are poorly equipped and insufficiently staffed for teaching. Ask yourself what your user-to-librarian ratio is (e.g. at the University of Nevada it’s about 680 to 1) and then ask yourself how you’re going to train all those users. We need to focus our efforts on eliminating the barriers that exist between users and the information they need. If our services can’t be used without training, then it’s the services that need to be fixed-not our users. One-button commands, such as Flickr’s “Blog This,” and easy-to-use programs like Google Page Creator, offer promising models for this kind of user-centric service.

➢ **The “come to us” model of library services:** There was a time when libraries exercised something close to monopoly power in the information marketplace. During the print era, if you wanted access to pricey indexes or a collection of scholarly journals, you had no choice but to make a trip to the library. It worked moderately well for those privileged with access to
a good library. In the post-print era, we have to be a bit more humble and find new ways to bring our services to users. At a minimum, this means placing library services and content in the user’s preferred environment (e.g. the Web); even better, it means integrating our services into their daily patterns of work, study and play. No profession can survive if it throws its core principles and values overboard in response to every shift in the zeitgeist. However, it can be equally disastrous when a profession fails to acknowledge and adapt to radical, fundamental change. We need to shift direction, and we can’t wait for the big ship of our profession to change course first. It’s going to have to happen one library-one little boat-at a time.

KEY WEB 2.0 SERVICES/APPLICATIONS IN LIBRARIES

Web 2.0 technologies, tools, and applications define how librarians share their perspectives, opinions, thoughts and experiences to become more and more popular. Figure 1 shows the Web 2.0 services as described below.

Forums

A forum is an online community discussion group, usually centered around one topic or theme, where people can post messages or comment on other messages (A Social Media Glossory, 2008). Forum provides a meeting point for collaboration. Instead of linking to another piece of information, they are the
Web 2.0 Services

- Forum
- Wiki
- RSS
- Blog
- Podcasting
- Video Sharing
- SN
- IM
- Tagging & Bookmarking

Applications

- Discussion
- Subscription
- Publishing
- Publishing
- Publishing
- Relation
- Communication
- Searching

Purpose

- Very
- High
- Medium
- Very
- Very
- Very
- Very
- High

Usage

- Very
- High
- Medium
- Very
- Very
- Very
- Very
- High

Figure 1
Web 2.0 Services and Applications
starting point of a discussion or communal task. Forum is the easiest way to start working actively in Web 2.0 because there is a need to click a reply button and express the thought. Forum can be used in the following way.

- Act as an electronic medium for quick exchange of informal information and experiences related to new initiatives, plans, projects, information sources and services, forthcoming events and international developments.
- Purpose of forum is not only delivery of data in response to query but also supports communication among a large number of people belonging to different parts of the world within a short duration.
- Find new peer workers and enable posting problems (does anybody know?) and seek solutions.

<table>
<thead>
<tr>
<th>Examples</th>
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<tbody>
<tr>
<td><strong>LIS-Forum:</strong> ncsi.iisc.ernet.in/mailman/listinfo/lis-forum</td>
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<td><strong>Corporate Librarians:</strong> <a href="http://finance.groups.yahoo.com/group/corporatelibrns/">http://finance.groups.yahoo.com/group/corporatelibrns/</a></td>
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**Wikis**

Wiki is a webpage or set of webpages that can be easily edited by anyone who is allowed to access (E Bersbach, Glaser and Heigl, 2006). Since 2001, Wikipedia has rapidly grown as a largest reference website on the Internet. 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. Wiki pages have an edit button displayed on the screen and the user can click on this to access an easy-to-use online editing tool to change or even delete the contents of the page in question. Simple, hypertext-style linking
between pages is used to create a navigable set of pages. Wiki can be employed as following:

- Wikis can also be used by the users to share information and enhance the content, and a record of these transactions is archived for future reference.
- Reference resources on wiki can be built and wikis can be used for creating subject guides, subject gateways, etc.
- Use as a presentation tool (as e-portfolios); as a group research project for a specific idea; manage school and classroom documents; use as a collaborative handout for users; writing: student created books and journaling.
- Create and maintain a user FAQ; for example in a classroom discussion and debate area; a place to aggregate web resources; supporting committees, working parties and university projects etc.

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<td><strong>LIS Wiki</strong>: <a href="http://liswiki.org/wiki/Main_Page065">http://liswiki.org/wiki/Main_Page065</a>;</td>
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<td><strong>Princeton Public Book Lovers Wiki</strong>: <a href="http://booklovers.pbwiki.com/5%20Star%20Revie">http://booklovers.pbwiki.com/5%20Star%20Revie</a></td>
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<tr>
<td><strong>Online notes</strong>: <a href="http://www.wikiineducation.com/display/ikiw/Home">http://www.wikiineducation.com/display/ikiw/Home</a></td>
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RSS

After the advent of desktop publishing in the 80s and the web pages in the 90s, it is considered as the most important Internet technology of the 2000s. RSS is a family of formats which allow users to find out about updates to the content of RSS-enabled websites, blogs or podcasts without actually having to go and visit the site. Technically, RSS is an XML-based data format for websites to exchange files that contain publishing information and summaries of the site’s contents. Indeed, in its earliest incarnation, RSS was understood to stand for Rich Site Summary (Doctorow, Dornfest, F. Johnson, J. Scott and Powers, 2002). There are a number of RSS formats such as RSS 0.91, RSS 0.92, RSS 1.0, RSS 2.0 (RSS 2.0 at Harvard Law). It is worth noting that RSS 2.0 is not simply a later version of RSS 1.0, but is a different format. As it has become more widely used for blog content syndication, in later versions RSS became known as Really Simple Syndication (RSS Advisory Board service). It has become commonly used for dissemination of information in the scientific setting too (Obst, 2009). RSS can be deployed as the following way.

- RSS announce the availability of new books and other resources in a given subject area as well as the availability of new research and learning opportunities.
- Librarians can subscribe to RSS from the sources for compiling their customized alerts.
- RSS promote events organized for library users and integrate library services through RSS feeds.
- Enhance Library Instruction for different Web 2.0, Library 2.0, Blogs, Wikis, RSS, Tagging, Podcasting, IM programs/courses by integrating appropriate resources.

**Examples**

| Library of Congress: www.loc.gov |
| University of N. Carolina – Greensboro Online Resources with RSS Feeds: http://library.uncg.edu/dbs/vdbsrss-index.asp |
| Hennepin County Library: http://www.hclib.org/pub/search/RSS.cfm |

**Blogs**

The term web-log, or blog, was coined by Jorn Barger in 1997 and refers to a simple webpage consisting of brief paragraphs of opinion, information, personal diary entries, or links, called posts, arranged chronologically with the most recent first, in the style of an online journal (Doctorow, Dornfest, F. Johnson, J. Scott and Powers, 2002). Most blogs also allow visitors to add a comment below a blog entry. Blog entries, also known as blog posts, consist of a title, body, permalink (permanent link), postdate, comments, category or tag, trackback (the ability to notify another blog that you added a post to your blog that is related to a post or comment on its blog), or pingback (the ability to request notification when somebody links to one of your posts). Most blogs are primarily textual, but some focus on photographs (photoblog or photolog), videos (videoblog or vlog), or audio (podcast), mobile devices such as pocket PC, mobile phone, or PDA (mblog) and real-time blogging (liveblogging). A blog can be private (internal to an organization) or public (open to anyone) (Understanding Web 2.0). Blogs have several unique characteristics that together distinguish...
them from other forms of electronic communications such as email, instant messaging, short message service, and multimedia message service (Robert and Shel, 2006). Blogs can be used as following:

- Blogs serve as a platform where the users can file their concerns, queries and suggestions regarding the services and activities of the library.
- Blogs can also be used for the collection development where the users request the resources, for marketing of library and information services, and for posting minutes of the meetings for necessary actions and discussions.

<table>
<thead>
<tr>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latvian Librarian Blogs: <a href="http://bibliotekari.blogspot.com/">http://bibliotekari.blogspot.com/</a>;</td>
</tr>
<tr>
<td>Library of Congress: <a href="http://www.loc.gov">www.loc.gov</a></td>
</tr>
</tbody>
</table>

Podcasts

Podcasts are audio recordings, usually in MP3 format, of talks, interviews and lectures, which can be played either on a desktop computer or on a wide range of handheld MP3 devices. Originally called audio blogs they have their roots in efforts to add audio streams to early blogs (Felix and Stolarz, 2006). A podcast is made by creating an MP3 format audio file (using a voice recorder or similar device), uploading the file to a host server, and then making the world
aware of its existence through the use of RSS (Patterson, 2006). Apple introduced the commercially successful iPod MP3 player and its associated iTunes software. The process is known as podcasting (Hammersley, 2004). Podcast can be installed in the following way.

- Podcasts promote recordings about the library’s services and programs as well as highlight about new resources.
- Podcasts enable librarians to share information with anyone at any time.
- Podcasting can be a publishing tool for users and librarians’ oral presentations.

**Examples**

<table>
<thead>
<tr>
<th>Library of Congress:</th>
<th><a href="http://www.loc.gov">www.loc.gov</a></th>
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</thead>
<tbody>
<tr>
<td>Worthington Libraries:</td>
<td><a href="http://www.worthingtonlibraries.org/programs2go/">http://www.worthingtonlibraries.org/programs2go/</a>;</td>
</tr>
<tr>
<td>Denver Library:</td>
<td><a href="http://podcast.denverlibrary.org/">http://podcast.denverlibrary.org/</a>;</td>
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</tbody>
</table>

**Video sharing**

Video and photo sharing are important aspects of Web 2.0, especially at popular sites like YouTube (youtube.com) and Flickr (flickr.com). Almost everyone with Internet access is familiar with YouTube; it has become quite a sensation around the world as it creates temporary fame around the most popular videos. Some people load their own videos to share, but plenty of people watch videos without ever loading one to the website or even creating an account. Video sharing can be used in the following way.
Libraries are using sites like YouTube to promote their services, record events and programs, educate patrons and staff and much more.

<table>
<thead>
<tr>
<th>Examples</th>
</tr>
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<tbody>
<tr>
<td><strong>Colorado Library Videos Online:</strong> <a href="http://www.cde.state.co.us/cdelib/technology/libyoutube.htm">http://www.cde.state.co.us/cdelib/technology/libyoutube.htm</a></td>
</tr>
<tr>
<td><strong>Multnomah County Library:</strong> <a href="http://www.youtube.com/watch?v=QP7uexIzotQ">http://www.youtube.com/watch?v=QP7uexIzotQ</a></td>
</tr>
<tr>
<td><strong>New York Public Library:</strong> <a href="http://www.nypl.org/live">http://www.nypl.org/live</a></td>
</tr>
<tr>
<td><strong>Video sharing sites:</strong> <a href="http://vimeo.com/">http://vimeo.com/</a>; <a href="http://www.ustream.tv/">http://www.ustream.tv/</a></td>
</tr>
<tr>
<td><strong>Others:</strong> <a href="http://www.youtube.com">www.youtube.com</a>, <a href="http://www.flicker.com">www.flicker.com</a></td>
</tr>
</tbody>
</table>

**Social Networks**

Social networks offer a way to understand the complex dynamics of communities (Hillary, 1955), and how people exchange support, by shifting away from a socio-graphic structure towards a structure of interpersonal relationships (Wellman and Gulia, 1999). Social networks help us understand how individuals share information, experiences, and support and how they accomplish their tasks (Nardi, Whittaker and Schwarz, 2000). The social networks view of exclusively linking people needs to be extended to include information, resources, and artifacts.

A social network can be formalized into a net structure comprising nodes and edges. Nodes represent individuals or organizations. Edges connecting nodes are called ties, which represent the relationships between the individuals and organizations. Myspace and Facebook are two popular social networking sites launched during 2003 and 2004 respectively. Myspace and Facebook allow
organizations and librarians to create their own profiles and pages. Social Networks can be used in the following way:

- Libraries can create professional and social networking sites that facilitate meeting people, finding like minds, sharing content - uses ideas from harnessing the power of the crowd, network effect and individual production/user generated content.
- Social networking could enable librarians and patrons not only to interact, but to share and change resources dynamically in an electronic medium.
- For building network among the interested group in discussing the common interest. User content can be added to the library catalogue, including users' book reviews or other comments.

<table>
<thead>
<tr>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bryant University Library</strong>: <a href="http://www.facebook.com/pages/Smithfield-RI/Bryant-University-Library/#/pages/Smithfield-RI/Bryant-UniversityLibrary/42442031994?ref=ts">http://www.facebook.com/pages/Smithfield-RI/Bryant-University-Library/#/pages/Smithfield-RI/Bryant-UniversityLibrary/42442031994?ref=ts</a></td>
</tr>
<tr>
<td><strong>Brooklyn College Library</strong>: <a href="http://www.myspace.com/brooklyncollegelibrary">www.myspace.com/brooklyncollegelibrary</a></td>
</tr>
<tr>
<td><strong>The University of North Carolina, University Libraries</strong>: <a href="http://library.uncg.edu/info/depts/reference/instruction/collaborate/ning.aspx">http://library.uncg.edu/info/depts/reference/instruction/collaborate/ning.aspx</a></td>
</tr>
<tr>
<td><strong>Others</strong>: <a href="http://www.ning.com">www.ning.com</a></td>
</tr>
</tbody>
</table>

**Instant Messaging (IM)**

IM is a form of real time communication between two or more people based on typed text, images etc. IM has become increasingly popular due to its quick response time, its ease of use, and possibility of multitasking. It is estimated that there are several millions of IM users, using for various purposes such as: simple requests and responses, scheduling face to face meetings, or
just to check the availability of colleagues and friends. IM can be applied in the following way.

- IM is a form of instant clarifications for the questions from users and vice versa.
- IM is also a form of online discussions/meetings/chatting and a way for providing virtual reference services to the users.

<table>
<thead>
<tr>
<th>Examples</th>
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</thead>
<tbody>
<tr>
<td><strong>Saint Joseph Public Library</strong>: <a href="http://www.libraryforlife.org/asksjcpl/asksjcpl.html">http://www.libraryforlife.org/asksjcpl/asksjcpl.html</a></td>
</tr>
<tr>
<td><strong>Durham University Library</strong>: <a href="http://www.dur.ac.uk/library/contacts/ask/im/">http://www.dur.ac.uk/library/contacts/ask/im/</a></td>
</tr>
</tbody>
</table>

### Tagging and Social Bookmarking

A tag is a keyword that is added to a digital object (e.g. a website, picture, video, etc.) to describe it, but not as part of a formal classification system. Users tag documents, choosing and adding uncontrolled keywords that allow them better to identify the documents from their own point of view. One of the first large-scale applications of tagging was seen with the introduction of Joshua Schacter’s del.icio.us website, which launched the ‘social bookmarking’ phenomenon. The concept of tagging has been widened far beyond website bookmarking, and services like Flickr (Photos), YouTube (video) and Audio (podcasts) allow a variety of digital artifacts to be socially tagged. Tagging and Social Bookmarking can be applied in the following way.
Tagging can be applied to the library management system for editing the subject headings from the user point of view and thereby enhancing the indexing and relevancy of the searches.

Tagging would greatly facilitate the lateral searching.

**Examples**

<table>
<thead>
<tr>
<th>Library Thing</th>
<th>University of Pennsylvania</th>
<th>Library of Congress</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><a href="http://www.snapfish.com/">http://www.snapfish.com/</a></td>
</tr>
</tbody>
</table>

**IMPACT OF WEB 2.0**

The Web 2.0 technology allows libraries to help and to serve their users more efficiently and to reach a new audience. While the impact and advantages are touted by proponents of Web 2.0, there are also those who feel that this technology will do more harm than good. Librarians and information professionals may start to feel uneasy about their own inability to keep up with the rapid changes in technology and they may start to feel that they are losing control of the environment in which they are training and supporting users. Similarly, Web 2.0 is a powerful resource that will allow our users to receive information from many sources, to be actively involved in creating content and generating knowledge, and to communicate with each other and spread ideas. These advantages bring with them certain risks, such as low quality of information, loss of data, security and legal issues. The table 2 shows the
following positive and negative impact of Web 2.0 on librarians and information professionals as well as on users (Miranda, Gualtieri and Coccia, 2009).

Table 2
Impact of Web 2.0

<table>
<thead>
<tr>
<th>On</th>
<th>Positive Impact</th>
<th>Negative Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Librarians and Information Professionals</td>
<td>• Collaboration - Customization</td>
<td>• Too many different tools</td>
</tr>
<tr>
<td></td>
<td>• Communication - Knowledge</td>
<td>• Doubts over the reliability of tools</td>
</tr>
<tr>
<td></td>
<td>• Sharing - Updating</td>
<td>• Difficulties in standardization</td>
</tr>
<tr>
<td></td>
<td>• Flexible tools - Speed</td>
<td>• Low level of security and privacy</td>
</tr>
<tr>
<td></td>
<td>• Reduction of costs – Training</td>
<td>• Low level of cataloguing information</td>
</tr>
<tr>
<td></td>
<td>• Facilitates experimentation</td>
<td>• Doubts over the longevity of tools</td>
</tr>
<tr>
<td></td>
<td>• Requires little technical expertise</td>
<td>• Confidentiality concerns</td>
</tr>
<tr>
<td></td>
<td>• Reduction of costs</td>
<td>• Ownership of data issues</td>
</tr>
<tr>
<td></td>
<td>• Flexibility</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• User involvement</td>
<td></td>
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<tr>
<td></td>
<td>• Time saving</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Reduces information overload</td>
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</table>

CONCLUSION

Libraries have skilled staff with professional expertise that can be leveraged to raise the challenge of Web 2.0, not only in collection and preservation, but also in user centered services. They are also the guardians of a long tradition of a public service ethic which will increasingly need to deal with the privacy and legal issues raised by Web 2.0. Library staff should encourage in thinking and acting pro-actively about how they can bring this to bear on the development of new library and information service-based technologies.
The web simply is not a destination anymore, with more terminals where users have the opportunity to interact in countless ways with media and other users in a far more interactive manner than earlier. And if “Web 1.0” was about finding information, Web 2.0 is more about finding communities of people-and their information finding. Web 2.0 describes a range of increasingly popular web services that offer users dynamic interactive models of communication combined with the ability to create and share content. This collaborative environment has sparked new levels of interest and discussion around the future of the Web.

Crawford (2006) said:

“I’ve always believed that good public (and academic) libraries should pay special attention to the records and ideas of their own communities. Using “Web 2.0” tools to make that operation more powerful are in the long tradition of library creativity and change.”

Services under the Web 2.0 umbrella will increasingly impact on what the librarians do in the online environment. But the challenge not only lies in learning how Web 2.0 services work as part of professional development but also in determining and implementing the most appropriate Web 2.0 tools that will provide useful Library 2.0 patron centered services.
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INFORMATION SEEKING BEHAVIOUR: A CASE STUDY OF FACULTY MEMBERS OF SOCIAL SCIENCES, PANJAB UNIVERSITY, CHANDIGARH

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Abstract

Information skills are helpful to everybody, especially faculty members. Information seeking is of prime importance in order to achieve everybody’s academic goals. Information technology has developed rapidly and has had a huge impact on access to information and on information seeking behaviour. Information seeking behaviour is a broad term encompassing the ways individuals articulate their information needs, seek, evaluate, select, and use information. This study has examined the criteria of information seeking behaviour of the social sciences faculty.

In this study an attempt has been made to examine the Information Seeking Behaviour of Faculty Members of Social Sciences, Panjab University, Chandigarh.

1.1 INTRODUCTION

The study of information seeking behaviour of faculty members especially in developing countries has been a significant and eventful issue from last few decades. The reasons have been the growth of information. The current ambit of information atmosphere is rich, characterized by an explosion of information sources and
providers, a multiplicity of methods for accessing information and a redundancy of content from multiple sources. Developments in information and communication technologies have been responsible for information explosion. Due to the information explosion the faculty members face many difficulties to locate, evaluate, use and communicate information. It is assumed that the faculty members gather information from different sources. Many electronic resources are now available and the increase in information available on the web has affected information seeking behaviour. Thus information seeking behaviour is the purposive seeking for information as a consequence of a need to satisfy some goal.

In everyday language data and information are used interchangeably. The Oxford American Dictionary defines data as: “facts or information to be used as a basis of discussing or deciding something”. At the same time information is defined as “facts told or discovered or facts to be feed to a Computer”. But these terms have different meanings. Data are collection of observations, which may or may not be true. Thus data may not be facts. Data become information when they are processed. To process data one needs to-

1. Clean the data from errors and reduce sources of unreliability.
2. Analyze data to make it relevant to decision at hand.
3. Organize data in ways that help understanding.

INFORMATION IS CREATED FROM DATA
Information is “meaningful data”. Data are the building blocks (the bricks and mortar) and information is the finished house. The raw materials are useless as a pile but once organized into a structure they became someone’s house. Likewise data are useless for managers unless organized into information.

The word ‘information’ is defined or interpreted very differently in the disciplines that have information as their core area of study and research. The researcher concluded that information is required in man’s daily activities be it in school, play or work situation. The nature of information is that, it is an element of a knowledge spectrum. Information is crucial to man’s survival. Human beings are basically active and goal oriented and willing to get information about themselves and the world. Their actions are directed by intentions, expectations and response. They maintain knowledge in memory in hierarchically organized structures, schemes and new knowledge is constructed on the basis of previously learned knowledge.

1.2 DEFINITIONS

According to Belkin- “The information associated with a text is the generator’s modified (by purpose, intent, knowledge of recipient’s state of knowledge) conceptual structure which underlines the surface structure (e.g. language) of that text”.

According to Ingwerson- As information being “the result of a transformation of the generator’s cognitive structures (by intentionality, model of the recipients’ state of knowledge, and in the form of signs), and “on the other hand information is something- a structure which, when perceived, may affect and transform the recipient’s state of knowledge”.

According to Dewin & Nilan, Information is seen as “something constructed by human beings”.
According to Uttor- “Information as data value in planning, decision making and evaluation of any programme. He goes further to say that it is a data that have been subjected to some processing functions capable of answering user’s query be it recorded, summarized, or simply collected that would help decision making. It is well understand in terms of books, journals, magazines, public and private sector documents of all kinds, whether published for mass circulation or unpublished and restricted or confidential in nature, results of research efforts which are made available to colleagues in form of reports, books, articles and non-printed materials”.

1.3 INFORMATION SEEKING

1.3.1 Meaning

The term information seeking often serves as an umbrella overarching a set of related concepts and issue. In the library world, discussions of database construction and management, community information needs, reference services, and many other topics resonate with the term. Information is the behavior of “seeking information”. Information search is any purposeful activity leading to collecting data and processing it to become information. Thus asking direct questions is information seeking. Information seeking means different things in different contexts. In the simplest terms, information seeking involves the search, retrieval, recognition, and application of meaningful content. Information seeking has been viewed as a cognitive exercise, as a social and cultural exchange, as discrete strategies applied when confronting uncertainty, and as a basic condition of humanity in which all individuals exist. Information seeking is the first step in bringing about individual or organizational change. It helps prepare and lead managers to action. Even after action, information seeking continues in order to reconfirm the validity of the action taken and give a feeling of control over events.
1.3.2 Definitions

According to case- Information Seeking as “a conscious effort to acquire information in response to a need or gap in your knowledge”.

According to Fourie- Information Seeking as “a complex, dynamic, social human behaviour that needs as rich a picture as possible to truly understand the phenomenon and even then there will be many unanswered questions”.

According to Salton, Shneiderman- “Many accounts of the information seeking process assume an interaction cycle consisting of identifying an information need, followed by the activities of query specification, examination of retrieval results and if needed, reformulation of the query, repeating the cycle until a satisfactory result set is found”.

According to Marchionini- “Information Seeking is a special case of problem solving. It includes recognizing and interpreting the information problem, establishing a plan of search, conducting the search, evaluating the results and if necessary, iterating through the process again”.

According to Ikoja-Odonga and Ocholla- “Information seeking as a process that requires an information seekers, or what might be called ‘Personal information structures’ ‘such as a person’s cognitive abilities, his or her knowledge, skills in relation to the problem or task domain, knowledge and skills specific to a system and knowledge and skills regarding information seeking”.

According to Anderson- “Information seeking has looked at how individuals go about finding the materials they needs”.

1.3.3 Steps Involve in the Information Seeking Process
1.3.3.1 Need

Initiation begins with the recognition of an information need and involves the first attempts to resolve uncertainty. In behavioral psychology theories, uncertainty, novelty and variety provides the initial motivation for information seeking. Information need is often understood in information science as evolving from a vague awareness of something missing and as culminating in locating information that contributes to understanding and meaning. Information need is an anomalous state of knowledge or a gap in individual’s knowledge in sense-making situations.

1.3.3.2 Selection

Once one recognizes the need to know, the question of what one needs to know must be answered. In selection, the individual has to clear about his information need in relation to a general topic or field of knowledge. Information seeking situations may require an individual to relate a highly organized taxonomy of subject areas their particular question or problem.

From a social perspective, information seeking can be considered a socially normative process, a means by which individuals identify, adapt, and transfer values, beliefs, ideas and codes of behaviour. Information Seeking is communication and communication is more than the exchange of substantive data, it is a relationship in which participants share their ideas about themselves, their cohorts, and others outside of the relationship.

1.3.3.3 Exploration

The exploration stage finds the seeker searching for information about their topic or topics of interest, with the basic concepts and identifying related issues. Exploration serves as the method by which the foundations of new constructs are laid. Exploration provides the topography that one traverses to carve out and individual path of understanding. Both personal and social factors affect both the
process and the product of exploration. Individuals tend to value information gained from their own experiences and seeking advice from others within their social group. It does not mean that information from outside the immediate personal and social realm is not relevant or helpful in information seeking, but that collaboration and communication afford the individual the opportunity to use such information in ways that are meaningful.

1.3.3.4 Formulation

As individuals begin to use general information to generate more specific and detailed questions, to narrow their topic, and to begin searching for information of greater depth than breadth, they engage in formulation. Formulation requires the seeker to make connections between different ideas, to think critically about the information reviewed and to make personally relevant choices based upon his or her learning.

1.3.3.5 Collection

In collection, the seeker gathers and reviews resources that address the specific focus he or she has formulated. The individual should have developed enough of a general understanding of the principles and concepts underlying his or her problem to make decisions regarding relevance of both content and form. Collection requires the individual to choose not only what is related to the specific concern but also to determine how each new idea fits into the developing solution.

1.3.3.6 Presentation

All individuals present the fruits their information seeking when they apply new knowledge. As information is put to use, issues of power and obligation arise. New knowledge may be a tool for resistance or assimilation. It may help to resolve an issue or reveal even greater depths of dissonance and controversy.
1.4 INFORMATION BEHAVIOUR

1.4.1 Meaning

Information behaviour is the face-to-face communication with others, as well as the passive reception of information. It is the totality of human behaviour in relation to sources and channels of information, including both active and passive information seeking, and information use. Various definitions of information behaviour have been given by researchers. Some defined the term based on the general model of behaviour developed by Wilson.

1.4.2 Definitions

According to Wilson a general model of information behaviour needs to include at least the following three elements:

1. “an information need and its drivers, i.e., the factors that give rise to an individual’s perception of need;
2. the factors that affect the individual's response to the perception of need; and
3. the processes or actions involved that response.”

Taylor defines information behaviour as the product of certain elements of the information use environment. The elements are:

1. “the assumptions, formally learned or not, made by a defined set of people concerning the nature of their work.
2. the kinds and structure of the problems deemed important and typical by this set of people.
3. the constraints and opportunities of typical environments with in which any group or subgroup of this set of people operates and works.
4. the conscious, and perhaps unconscious, assumptions made as to what constitutes a solution, or, better said, a resolution of problems, and what makes information useful and valuable in their contexts.”

1.5 INFORMATION SEEKING BEHAVIOUR

1.5.1 Meaning

The need for information is one of the cognitive needs of human kind. Information need causes information–seeking behaviour are affected by many factors. Information seeking behaviour is expressed in various forms, from reading printed material to research and experimentation. Scholars, Students and Faculty actively seek current information the various sources available in libraries e.g. Encyclopedias, Journals and more currently Electronic Media.

Information seeking behaviour is considered a multifarious, dynamic, Social Human Behaviour that needs a picture as rich as possible to truly understand the phenomenon, and even then, there will remain many questions answered. Information-seeking behaviour depends on the reasons for seeking information and the starting knowledge of the individual.

Progress in information technology has offered today’s information seekers different opportunities to access the information resources in variety of formats, including commonly available electronic information sources, such as CD-ROMs, databases, Web-OPACs and the internet. These are replacing the print based information sources as the primary media for the storage and communication of recorded information.

The increase in information available on the web has affected information-seeking behavior, with many types of information in many different locations all available in one place. Information seeking behaviour involves personal reasons for
seeking information, the kinds of information which are being sought, and the ways and sources with which needed information is being sought.

1.5.2 Definitions

According to Wilson (1999) - “Information Seeking behaviour includes “those activities a person may engage in when identifying their own needs for information, searching for such information in any way, and using or transferring that information”.

According to Kakai, et al. (2004) - have defined information seeking behaviour as an individual’s way and manner of gathering and sourcing for information for personal use, knowledge updating, and development.

According to Marchionini (1995) - “Information seeking is thus a natural and necessary mechanism of human existence”. International Encyclopedia of Information and Library Science defines information-seeking behaviour as: “The complicated form of actions, which people slot in, when seeking information of whatever kind for whatever reason.”

According to Wilson (2000) - Information seeking behaviour is the purposive seeking for information as a consequence of a need to satisfy some goal. In the course of seeking, the individual may interact with manual information systems (such as a newspaper or a library), or with computer-based systems (such as the web).

According to Leckie, Pettigrew & Sylvain (1996) - Information seeking behaviour involves Personal reasons for seeking information, the kinds of information which are being sought, and the ways and sources with which needed information is being sought.

1.6 NEED OF THE STUDY

Information skills are helpful to everybody, especially faculty members. Information seeking is of prime importance in order to achieve everybody’s academic
goals. Information technology has developed rapidly and has had a huge impact on access to information and on information seeking behaviour. Information seeking behaviour is a broad term encompassing the ways individuals articulate their information needs, seek, evaluate, select, and use information. This study has examined the criteria of information seeking behaviour of the social sciences faculty. According to the need of the study I have tried to find out the answer of some questions like:

1. What methods are used for seeking information?
2. How is information technology used by these members?
3. Which language they prefer to gather the information?
4. What are the problems faced by the faculty when seeking information?
5. What kind of information is sought by faculty members of social sciences?

1.7 PURPOSE OF THE STUDY

The major purpose of the study was to examine the Information Seeking Behaviour of Faculty Members of Social Sciences, Panjab University, Chandigarh specifically. The study made effort to determine the sources consulted and the general pattern of information gathering system by the faculty.

1.8 LIMITATIONS OF THE STUDY

In research, limitation of a problem is as essential as is the relation. By limitation we not only pin point our problem but also get a set of some guidelines for the correlating the relevant data. This study has been limited in respect of the following:

1. The study has been confined to only Social Sciences Faculty of Panjab University, Chandigarh.
2. In this study, Social Sciences Faculty are considered the member of economics, education, geography, history, law, library science, political science, public administration, psychology, sociology.

3. The sample is confined to 100 respondents of Social Sciences Faculty, Panjab University, Chandigarh.

2.0 Research Methodology

Case study is a deep and diagnostic study. It is acclaimed as a useful research technique. It is a method of qualitative analysis in which complex factors are studied. Qualitative methods are applied to research on complex phenomena of the society for example social processes, structures, and relations when the purpose is to gather information which can’t be expressed in numbers and quantities. This study is comprehensive and all the variables and traits will be linked with one another. This study will followed for comparison, classification and analysis and for the formulation of hypothesis leading to further research.

A case study is a puzzle that has to be solved. The first thing to remember about writing a case study is that the case should have a problem for the readers to solve. The case should have enough information in it that readers can understand what the problem is and, after thinking about it and analyzing the information the readers should be able to come up with a proposed solution. Writing an interesting case is a bit like writing a detective story. You want to keep your readers very interested in the situation.

In order to learn and understand how Social Sciences Faculty of Panjab University, Chandigarh look for information and what methods they are adopted to get the information. The study adopted a descriptive survey design and data was collected using a questionnaire administered to hundred respondents randomly selected from across the ten departments of Social Sciences Faculty in the Panjab.
University, Chandigarh constituted the sample for the study. The questionnaire has three parts. Part-A general information, Part-B: Use of the Library and Part-C: Information Seeking Behaviour which consists 18 questions. The questionnaires were administered to the sample in their respective departments. On the whole, 90 completed cases were used for data analysis. Data collected was analysed using descriptive statistics of frequency and percentages.

2.1 RESEARCH SETTINGS

A brief profile of Panjab University and University Library. The area under study for this research work, have been discussed below.

2.1.1 PROFILE OF PANJAB UNIVERSITY:

Panjab University is one of the oldest Universities in India. It was established in 1882 at Lahore (now in Pakistan). The University Campus is spread over an area of 550 acres (2.2km²) in sectors 14 and 25 at the city of Chandigarh. The university has 75 teaching and research departments and 15 centers/chairs for teaching and research at the main campus located at Chandigarh. University has 188 affiliated colleges spread over Punjab and having one rural Regional Centre at Kauni, and 3 Regional Centres at Muktsar, Ludhiana and Hoshiarpur.

The University has been recognized by the UGC as the “University with Potential for Excellence in Bio-Medical Sciences” with facilities for Stem Cell Research and Drug Development.

The UGC has selected Panjab University for an academic collaboration with Oxford Brookes University as our chosen partner. Also department of Atomic Energy of GOI has selected PU as a node to be connected to National Knowledge Commission (NKC) with high network bandwidth.
The university computer center has established Gigabit technology to provide high speed. Connectivity to various departments through National Knowledge Network (NKN). Almost all the departments are connected through optical fibre. All hostels have been made WiFi and students can access internet free of cost with hardware fire-wall installed at computer centre with three wide area network links of 1 Gbps, 45 Mbps and 10 Mbps.

The university is having its own website to host date sheets, results, examination forms, etc. On the university website for the convenience of students/public.

The university has a coaching centre for training for IAS examination and allied services as well as other competitive examinations. The University has developed its own local area network in the campus.

2.1.2 PROFILE OF PANJAB UNIVERSITY A.C.JOSHI LIBRARY, CHANDIGARH

University library, named officially as “A.C. Joshi Library”, after the name of an illustrious Vice-Chancellor of this university, was established in the U.S. Club, Shimla in the year 1947 after the partition of the country. The Panjab University started shifting its offices to Chandigarh, the new capital of Punjab, in 1955-56. The foundation stone of the new library building was laid in 1958 by Dr. S. Radhakrishnan, then the Vice-President of India. The library in its new premises was
formally inaugurated in 1963 by Pt. Jawaharlal Nehru, then the Prime Minister of India.

The five storyed impressive library building in red stone and concrete is based on modern principles of architecture. The library building centrally air conditioned and equipped with computer and communication network houses more than six lakh volumes and has a seating accommodation of 500 readers. The library has a collection of over 6.4 lakhs publications which include books, bound volumes of journals, thesis/dissertations, rare books, reports, government documents, back files of newspapers and a prized collection of 1490 manuscripts. The library 4,000 journals are available online through UGC Infonet consortium and 300 from indes consortium. The library has developed a digital library portal. The library is amongst the top ten universities in India in journal usage through the Inflibnet consortium.

2.2 REVIEW OF LITERATURE

The literature review plays a very important role in the research process. It is extremely difficult to review the entire body of user research. Many significant contributions have been made by Psychologists, Sociologists, behavioural scientists and others in addition to library and information science personnel. As a result, the literature is scattered across many disciplines and wide-ranging resources. The literature of information seeking behaviour of faculty members available is greatly broad ranging. An attempt has been made to cover number of works that go beyond discussions of the information seeking behaviour itself and its direct applications to closely related topics such as information seeking.

Ellis and Haugean (1997) discuss the different models of information-seeking patterns. They explore the role of information and information-seeking. Authors identified eight major characteristics in the information-seeking patterns; surveying; chaining; monitoring; browsing; distinguishing; filtering; extracting and
ending. They identify identical or very similar categories of information-seeking behaviour to those of previous studies of academic researchers.

**Wilson (1999)** presents an outline of models of information-seeking and other aspects of information behaviour. He shows the relationship between communication and information behaviour in general with information-seeking and information searching in information retrieval systems. Author also presents an alternative problem solving model for information-seeking and various levels of information behaviour.

**Challener (1999)** investigated artists and art historians teaching in five liberal arts colleges and three universities. Results found that they need information for teaching. The participants almost all subscribe to art journals and many read newspaper. They visit libraries frequently, usually more than one library and unlike previous reports. The majority are willing to ask the librarian for help. A large percentage of both art historians and artists are using computers for teaching. All 27 participants use slides extensively in the classroom, supplemented in most cases by textbooks.

**Shokeen and Krishik (2002)** studied about information-seeking behaviour of social scientists working in the universities located in Haryana. They reported most of the social scientists visit the library daily. The first preferred method of searching the required information by the social scientists followed by searching through indexing and abstracting periodicals, and citations in articles respectively. The social scientists use current journals followed by books.

**Suriya, Sangeetha and Nambi (2004)** carried out a research work on “Information Seeking Behaviour of faculty members from government arts colleges in Cuddalore district”. The purpose of their study was to investigate, how faculty members seek information from the library. It mentions that most of the respondents
61 (38.12 percent) visited the library several times a week to meet their information needs. Regarding the type of search work by the respondents the majority of the respondents 91 (56.87 percent) work their search by subject.

Stenmark and Jadaan (2006) have made a study of Intranet users’ information-seeking behaviour using search log files. They collected and analysed three different years like 2000, 2002 and 2004 to study the shifting trend of information seeking behaviour in intranet search.

There is exhaustive literature reviewed by authors but important only highlighted. The study cited about indicates that considerable work has been done on information-seeking behaviour.

2.3 DESIGN OF THE STUDY

The study was designed to investigate the Information Seeking Behaviour of Panjab University Social Sciences Faculty. The nature of the study led to the use of descriptive survey method of research. This method is concerned with the study, description and investigation of what kind of situation exists. This method was employed in the present investigation for the purpose of surveying the information seeking behaviour of Social Science Faculty. It involved the application of Simple Statistical Techniques.

2.4 SAMPLE OF THE STUDY

“Probably no concept is as fundamental to the conduct of research and interpretation of its results as is sampling”. Every experiment needs only a sample at all possible observations, which could be made.

According to Good (1963), “Sampling is the essential part of all statistical procedures”. A sample thus is Social Sciences Faculty of Panjab University, Chandigarh.
The present study was conducted on 100 faculty members. The data was collected from the Social Sciences Faculty, Panjab University, Chandigarh.

### Table -2.4.1: Faculty wise distribution of Faculty Members

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Department</th>
<th>Professors</th>
<th>Associate Professors</th>
<th>Assistant Professors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Economics</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>Education</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>Geography</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>History</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>Law</td>
<td>11</td>
<td>6</td>
<td>7</td>
<td>24</td>
</tr>
<tr>
<td>6</td>
<td>Library Science</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Political Science</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>Public Administration</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>Psychology</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>10</td>
<td>Sociology</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>34</strong></td>
<td><strong>26</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

### 2.5 RESEARCH TOOLS

For every research, tools are required to collect the relevant data. As per Best (1986), “Like the tools in a Carpenter’s box, each research tool is appropriate in a given situation to accomplish a particular purpose”. Thus selection of suitable tool is very essential for a successful research.

In Social Sciences Research, most used and most abused of tools is the Questionnaire. In general, the word questionnaire refers to a device for securing answers to questions by using a form, which the respondent fills in himself (Good and Hatt, 1952).
Lippin Cott (1953) stated that, “Questionnaire generally refers to a systematic compilation of questions that are submitted to a sample of population from which information is desired”.

The Present Study was conducted with the help of a self-prepared questionnaire. Questionnaire used in this study were locally prepared and meant to elicit opinions of the respondents what methods they are adopted for seeking information. Along with the questionnaire, wherever necessary, personal observation was also used at some places while writing the final conclusions.

2.6 DESCRIPTION OF THE QUESTIONNAIRE

The Questionnaire used for the present study comprised of three parts. Part-A general information, Part-B: Use of the Library and Part-C: Information Seeking Behaviour which consists 18 questions. The primary purpose of this questionnaire is to examine the sources of information generally used by the social sciences faculty and the purpose of information seeking.

2.7 COLLECTION OF DATA

The data was collected personally from the Social Sciences Faculty. The faculty members were given the questionnaire and the instructions were explained to them and their doubts were cleared. The questionnaire was collected from them after checking whether they have completed it or not. The questionnaire were left with each respondent, to be filled up in privacy.

2.8 ANALYSIS OF DATA

Analysis of data means studying the tabulated material in order to determine inherent facts or meanings. It involves breaking down existing complex factors into simpler parts and putting the parts together in new arrangements for the purposes of
interpretation (Sukhia & Mehrotra, 1983). Bar-diagrams and Tables are used for the analysis of data.

2.9 STATISTICAL TECHNIQUES USED

Statistics is a body of mathematical techniques or a process of gathering, organizing, analysing and interpreting numerical data.

The techniques have been employed as per the design of the study. The main statistical techniques that have been employed in the study include percentage.

3.1 DATA ANALYSIS AND INTERPRETATION

From the below analysis we are able to know, how the faculty members of social sciences obtain the information from various sources and what are their methods, purpose and behaviour to locate the information.

3.2 FINDINGS

3.2.1 Frequency of the Library Visit

Table-3.1: Frequency of the Library Visit

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Frequency of Library Visits</th>
<th>Professors</th>
<th>Associate Professors</th>
<th>Assistant Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%age</td>
<td>Frequency</td>
<td>%age</td>
</tr>
<tr>
<td>1</td>
<td>Everyday</td>
<td>4</td>
<td>4.44</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>Weekly</td>
<td>10</td>
<td>11.11</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Fortnightly</td>
<td>13</td>
<td>14.44</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Monthly</td>
<td>4</td>
<td>4.44</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Rarely</td>
<td>4</td>
<td>4.44</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>No Opinion</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Figure-3.1: Frequency of the Library Visit

The question was asked about the library visit most of the professor visit the library fortnightly i.e. 14.44 percent and weekly is 11.11 percent. The associate professors most visit the library weekly i.e. 11.11 percent and everyday is 7.78 percent. The assistant professors i.e. 11.11 percent visit the library everyday (see Table-3.1).
### 3.2.2 Time Spent Per Week in the Library

**Table-3.2: Time Spent per Week in the Library**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Time</th>
<th>Professors</th>
<th>Associate Professors</th>
<th>Assistant Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
<td>%age</td>
<td>Frequency</td>
</tr>
<tr>
<td>1</td>
<td>1 to 2 hrs.</td>
<td>10</td>
<td>11.11</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>2 to 4 hrs.</td>
<td>10</td>
<td>11.11</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>4 to 5 hrs.</td>
<td>3</td>
<td>3.33</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>More than 5 hrs.</td>
<td>7</td>
<td>7.78</td>
<td>2</td>
</tr>
</tbody>
</table>

**Figure-3.2: Time Spent per Week in the Library**

![Bar chart showing time spent per week in the library for different faculty members](chart.png)
The question was asked about the time spent per week in the library. Most of the professors spend 1 to 2 hours and 2 to 4 hours (11.11 percent) and associate professors 4 to 5 hours (11.11 percent) and 2 to 4 hours (8.89 percent). Most of the assistant professors like to spend 4 to 5 hours (11.11 percent) see Table-3.2.

3.2.3 Method of Information Seeking

Table-3.3: Method of Information Seeking

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Method</th>
<th>Professors</th>
<th></th>
<th>Associate Professors</th>
<th></th>
<th>Assistant Professors</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
<td>%age</td>
<td>Frequency</td>
<td>%age</td>
<td>Frequency</td>
<td>%age</td>
</tr>
<tr>
<td>1</td>
<td>Discussion with colleagues</td>
<td>10</td>
<td>11.11</td>
<td>15</td>
<td>16.67</td>
<td>15</td>
<td>16.67</td>
</tr>
<tr>
<td>2</td>
<td>Consult a knowledgeable person in the field</td>
<td>4</td>
<td>4.44</td>
<td>2</td>
<td>2.22</td>
<td>16</td>
<td>17.78</td>
</tr>
<tr>
<td>3</td>
<td>Consult supervisor</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>7.78</td>
<td>8</td>
<td>8.89</td>
</tr>
<tr>
<td>4</td>
<td>Discussion with librarian or reference staff of the library</td>
<td>15</td>
<td>16.67</td>
<td>10</td>
<td>11.11</td>
<td>7</td>
<td>7.78</td>
</tr>
<tr>
<td>5</td>
<td>Discussion with librarian or reference staff of the other libraries</td>
<td>5</td>
<td>5.56</td>
<td>12</td>
<td>13.33</td>
<td>4</td>
<td>4.44</td>
</tr>
<tr>
<td>6</td>
<td>Review articles</td>
<td>11</td>
<td>12.22</td>
<td>4</td>
<td>4.44</td>
<td>4</td>
<td>4.44</td>
</tr>
<tr>
<td>7</td>
<td>Abstracting journals</td>
<td>10</td>
<td>11.11</td>
<td>8</td>
<td>8.89</td>
<td>4</td>
<td>4.44</td>
</tr>
<tr>
<td>8</td>
<td>Indexing journals</td>
<td>10</td>
<td>11.11</td>
<td>5</td>
<td>5.56</td>
<td>4</td>
<td>4.44</td>
</tr>
<tr>
<td>9</td>
<td>Internet</td>
<td>10</td>
<td>11.11</td>
<td>10</td>
<td>11.11</td>
<td>10</td>
<td>11.11</td>
</tr>
<tr>
<td>10</td>
<td>Publisher’s catalogue</td>
<td>4</td>
<td>4.44</td>
<td>3</td>
<td>3.33</td>
<td>4</td>
<td>4.44</td>
</tr>
<tr>
<td>11</td>
<td>E-mail alerting services/listserv</td>
<td>5</td>
<td>5.56</td>
<td>4</td>
<td>4.44</td>
<td>2</td>
<td>2.22</td>
</tr>
<tr>
<td>12</td>
<td>Any other</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
The question was asked about the method used by the faculty members for seeking information. Most of the respondents in professors category like to discussion with librarian or reference staff of the library (16.67 percent). The associate professors like to discussion with colleagues (16.67 percent) and assistant professors the highest majority is consult a knowledgeable person in the field (17.78 percent) see Table-3.3.
### 3.2.4 Purpose of Information Seeking

**Table-3.4: Purpose of Information Seeking**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Purpose</th>
<th>Professors</th>
<th></th>
<th>Associate Professors</th>
<th></th>
<th>Assistant Professors</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
<td>%age</td>
<td>Frequency</td>
<td>%age</td>
<td>Frequency</td>
<td>%age</td>
</tr>
<tr>
<td>1</td>
<td>For doing research work</td>
<td>15</td>
<td>16.67</td>
<td>6</td>
<td>6.67</td>
<td>5</td>
<td>5.56</td>
</tr>
<tr>
<td>2</td>
<td>For updating knowledge</td>
<td>16</td>
<td>17.78</td>
<td>6</td>
<td>6.67</td>
<td>6</td>
<td>6.67</td>
</tr>
<tr>
<td>3</td>
<td>For preparing class lecturers/ assignments</td>
<td>26</td>
<td>28.89</td>
<td>5</td>
<td>5.56</td>
<td>10</td>
<td>11.11</td>
</tr>
<tr>
<td>4</td>
<td>Formatting paper and presenting paper</td>
<td>12</td>
<td>13.33</td>
<td>5</td>
<td>5.56</td>
<td>4</td>
<td>4.44</td>
</tr>
<tr>
<td>5</td>
<td>For doing Ph.D.</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2.22</td>
<td>9</td>
<td>10.00</td>
</tr>
<tr>
<td>6</td>
<td>For guiding researchers</td>
<td>12</td>
<td>13.33</td>
<td>16</td>
<td>17.78</td>
<td>3</td>
<td>3.33</td>
</tr>
<tr>
<td>7</td>
<td>Preparing answer to specific question</td>
<td>5</td>
<td>5.56</td>
<td>4</td>
<td>4.44</td>
<td>7</td>
<td>7.78</td>
</tr>
<tr>
<td>8</td>
<td>For entertainment</td>
<td>2</td>
<td>2.22</td>
<td>4</td>
<td>4.44</td>
<td>2</td>
<td>2.22</td>
</tr>
</tbody>
</table>
Most of the respondents in the professors category, their purpose of information seeking is prepare class lectures/assignments (28.89 percent) and updating knowledge (17.78 percent). The associate professors purpose of information seeking is guiding researchers (17.78 percent) and (11.11 percent) for prepare class lectures/assignments in the category of assistant professors (see Table-3.4)
### 3.2.5 Type of Information Material

#### Table 3.5: Types of Information Material

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Type of Material</th>
<th>Professors</th>
<th></th>
<th></th>
<th>Associate Professors</th>
<th></th>
<th></th>
<th>Assistant Professors</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
<td>%age</td>
<td></td>
<td>Frequency</td>
<td>%age</td>
<td></td>
<td>Frequency</td>
<td>%age</td>
</tr>
<tr>
<td>1</td>
<td>Textbooks</td>
<td>26</td>
<td>28.89</td>
<td>22</td>
<td>24.44</td>
<td></td>
<td>30</td>
<td>33.33</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>General books</td>
<td>10</td>
<td>11.11</td>
<td>20</td>
<td>22.22</td>
<td></td>
<td>15</td>
<td>16.67</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Reference books</td>
<td>10</td>
<td>11.11</td>
<td>12</td>
<td>13.33</td>
<td></td>
<td>11</td>
<td>12.22</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Journals</td>
<td>12</td>
<td>13.33</td>
<td>5</td>
<td>5.56</td>
<td>7</td>
<td>7.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Newspapers</td>
<td>3</td>
<td>13.33</td>
<td>4</td>
<td>4.44</td>
<td>2</td>
<td>12.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Govt. publications</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>12.22</td>
<td>1</td>
<td>1.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Pamphlets</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Patents</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Thesis/research reports</td>
<td>6</td>
<td>6.67</td>
<td>7</td>
<td>7.78</td>
<td>6</td>
<td>6.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Survey reports</td>
<td>2</td>
<td>12.22</td>
<td>3</td>
<td>3.33</td>
<td>2</td>
<td>12.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Open access resources</td>
<td>1</td>
<td>1.11</td>
<td>4</td>
<td>4.44</td>
<td>1</td>
<td>1.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Magazines</td>
<td>2</td>
<td>12.22</td>
<td>2</td>
<td>2.22</td>
<td>2</td>
<td>2.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Manuscripts</td>
<td>1</td>
<td>1.11</td>
<td>1</td>
<td>1.11</td>
<td>3.33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>World wide web</td>
<td>10</td>
<td>11.11</td>
<td>2</td>
<td>2.22</td>
<td>1</td>
<td>1.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Consorting e-resources</td>
<td>6</td>
<td>6.67</td>
<td>2</td>
<td>2.22</td>
<td>1</td>
<td>1.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>CD-Rom databases</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1.11</td>
<td>1</td>
<td>1.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Online databases</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1.11</td>
<td>1</td>
<td>1.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Any other</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Faculty members were asked to indicate the type of information source which they used to seek information. For seeking information, professors like to prefer consult textbooks (28.89 percent). 24.44 percent also like to consult textbooks in the category of associate professors. 33.33 percent also like to consult textbooks in the category of assistant professors. So majority of the respondents like to consult textbooks (see Table-3.5).
3.2.6 Access the Documents

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Tools/Services</th>
<th>Professors</th>
<th>Associate Professors</th>
<th>Assistant Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Library catalogue/OPAC</td>
<td>20 22.22</td>
<td>16 17.78</td>
<td>23 25.56</td>
</tr>
<tr>
<td>2</td>
<td>Indexing journals</td>
<td>15 16.67</td>
<td>8 8.89</td>
<td>11 12.22</td>
</tr>
<tr>
<td>3</td>
<td>Abstracting journals</td>
<td>8 8.89</td>
<td>10 11.11</td>
<td>9 10.00</td>
</tr>
<tr>
<td>4</td>
<td>Reference from a book</td>
<td>10 11.11</td>
<td>13 14.44</td>
<td>20 22.22</td>
</tr>
<tr>
<td>5</td>
<td>Reference from a periodical article</td>
<td>15 16.67</td>
<td>10 11.11</td>
<td>6 6.67</td>
</tr>
<tr>
<td>6</td>
<td>Book reviews</td>
<td>10 11.11</td>
<td>10 11.11</td>
<td>6 6.67</td>
</tr>
<tr>
<td>7</td>
<td>Bibliographies produced by library staff</td>
<td>10 11.11</td>
<td>12 13.33</td>
<td>10 11.11</td>
</tr>
<tr>
<td>8</td>
<td>Any other (please mention)</td>
<td>0 0</td>
<td>0 0</td>
<td>0 0</td>
</tr>
</tbody>
</table>

The question was asked about the tools/services use to access the documents. Majority of the respondents like to use library catalogue/OPAC. In
professors 22.22 percent, associate professors 17.78 percent and assistant professor 25.56 percent (see Table-3.6).

3.2.7 Language Use

Table 3.7: Language uses

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Language</th>
<th>Professors</th>
<th>Associate Professors</th>
<th>Assistant Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
<td>%age</td>
<td>Frequency</td>
</tr>
<tr>
<td>1</td>
<td>English</td>
<td>40</td>
<td>44.44</td>
<td>35</td>
</tr>
<tr>
<td>2</td>
<td>Hindi</td>
<td>32</td>
<td>35.56</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td>Punjabi</td>
<td>10</td>
<td>11.11</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>Any other</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

A question was asked to find out the language of reading materials preferred by the faculty members. It is cleared from the analysis that 44.44 percent faculty use English language in the category of professors and 38.89 percent in the category of
associate and assistant professors. Hindi language is preferred by assistant professors 44.44 percent (see Table3-7).

3.2.8 Problems with Seeking Information

Table 3.8: Problems faced by the Faculty Members

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Problems</th>
<th>Professors</th>
<th>Associate Professors</th>
<th>Assistant Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
<td>%age</td>
<td>Frequency</td>
</tr>
<tr>
<td>1</td>
<td>Materials is not available in the library</td>
<td>15</td>
<td>16.67</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>Library staff is unwilling for service</td>
<td>11</td>
<td>12.22</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>Information is too vast</td>
<td>10</td>
<td>11.11</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>Information scattered in too many sources</td>
<td>15</td>
<td>16.67</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>Information sources are so far located</td>
<td>8</td>
<td>8.89</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Lack of time</td>
<td>10</td>
<td>11.11</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Do not know how to use the catalogue</td>
<td>4</td>
<td>4.44</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>Outdated information material</td>
<td>3</td>
<td>3.33</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>Incomplete information materials</td>
<td>5</td>
<td>5.56</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>Understanding of language</td>
<td>9</td>
<td>10.00</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>Any other</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Figure-3.8: Problems faced by the Faculty Members

Table-3.8 shows that the majority of faculty members 16.67 percent in the category of Professor and 17.78 percent in associate professors and 16.67 percent in the category of assistant professors face the same common problem i.e. information scatter in too many sources. Some face with availability of material. Some of them face library staff is unwilling for service and information is too vast and some of them face the problem that information services are so far located and lack of time (see Table-3.8).
3.2.9 Assistance from the Library

Table-3.9: Assistance Provided by the Library

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Assistance</th>
<th>Professors</th>
<th>Associate Professors</th>
<th>Assistant Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
<td>%age</td>
<td>Frequency</td>
</tr>
<tr>
<td>1</td>
<td>Orientation tour by the library staff</td>
<td>14</td>
<td>15.56</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>Individual assistance</td>
<td>21</td>
<td>23.33</td>
<td>16</td>
</tr>
<tr>
<td>3</td>
<td>Print instructions at library</td>
<td>20</td>
<td>22.22</td>
<td>17</td>
</tr>
<tr>
<td>4</td>
<td>Help from friends and colleagues</td>
<td>8</td>
<td>8.89</td>
<td>18</td>
</tr>
<tr>
<td>5</td>
<td>Any other</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure-3.9: Assistance provided by the Library

Most respondents are satisfied with the assistance provided by the library staff. 23.33 percent by individual assistance in the category of professors, 22.22 percent in the category of associate professor like the orientation tour by the library staff. 23.33 percent help from friends and colleagues in assistant professor (see Table-3.9).
3.2.10 Internet Use

Table-3.10: Internet Used by the Faculty

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Internet Use</th>
<th>Professors</th>
<th>Associate Professors</th>
<th>Assistant Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
<td>%age</td>
<td>Frequency</td>
</tr>
<tr>
<td>1</td>
<td>Internet use by the faculty</td>
<td>28</td>
<td>31.11</td>
<td>24</td>
</tr>
<tr>
<td>2</td>
<td>No opinion</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure-3.10: Internet Used by the Faculty

The faculty members were asked to indicate the use of the Internet. 31.11 percent of faculty members use the Internet which are professors and 26.67 percent associate professors and 23.33 percent by assistant professors.
3.2.11 Internet Access

Table-3.11: Capacity to Use the Internet

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Internet Access</th>
<th>Professors</th>
<th>Associate Professors</th>
<th>Assistant Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%age</td>
<td>Frequency</td>
<td>%age</td>
</tr>
<tr>
<td>1</td>
<td>Daily</td>
<td>16</td>
<td>17.78</td>
<td>13</td>
</tr>
<tr>
<td>2</td>
<td>Once a week</td>
<td>10</td>
<td>11.11</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>Once a fortnight</td>
<td>5</td>
<td>5.56</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>Once a month</td>
<td>6</td>
<td>6.67</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Rarely</td>
<td>2</td>
<td>2.22</td>
<td>1</td>
</tr>
</tbody>
</table>

Figure-3.11: Capacity to Use the Internet

The respondents were asked the capacity to use the Internet. 17.78 percent use it daily in professors category, 16.67 percent use it fortnightly in associate professors category and 11.11 percent use daily in assistant professors category (see Table-3.11).
3.2.12 Purpose to Use the Internet

**Table-3.12: Purpose to Access the Internet**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Purpose</th>
<th>Professors Frequency</th>
<th>%age</th>
<th>Associate Professors Frequency</th>
<th>%age</th>
<th>Assistant Professors Frequency</th>
<th>%age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Education</td>
<td>14</td>
<td>15.56</td>
<td>16</td>
<td>17.78</td>
<td>18</td>
<td>20.00</td>
</tr>
<tr>
<td>2</td>
<td>Entertainment</td>
<td>3</td>
<td>3.33</td>
<td>1</td>
<td>1.11</td>
<td>11</td>
<td>12.22</td>
</tr>
<tr>
<td>3</td>
<td>News</td>
<td>2</td>
<td>2.22</td>
<td>3</td>
<td>3.33</td>
<td>1</td>
<td>1.11</td>
</tr>
<tr>
<td>4</td>
<td>Health</td>
<td>5</td>
<td>5.56</td>
<td>2</td>
<td>2.22</td>
<td>1</td>
<td>1.11</td>
</tr>
<tr>
<td>5</td>
<td>Sports</td>
<td>3</td>
<td>3.33</td>
<td>4</td>
<td>4.44</td>
<td>3</td>
<td>3.33</td>
</tr>
<tr>
<td>6</td>
<td>Any other</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Figure-3.12: Purpose to Access the Internet**

The purpose behind to access the Internet is mostly use the Internet for education i.e. 15.56 percent in the category of professor. 17.78 percent in associate professors and 20 percent in assistant professors. So the majority is with education (see Table-3.12).
3.2.13 Internet Facility

Table-3.13: Avail the Facility of Internet

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Internet to use</th>
<th>Professors</th>
<th>Associate Professors</th>
<th>Assistant Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%age</td>
<td>Frequency</td>
<td>%age</td>
</tr>
<tr>
<td>1</td>
<td>University Library</td>
<td>13</td>
<td>14.44</td>
<td>13</td>
</tr>
<tr>
<td>2</td>
<td>Computer center</td>
<td>4</td>
<td>4.44</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Home</td>
<td>17</td>
<td>18.89</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>Internet Café</td>
<td>0</td>
<td>0.00</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>Any other</td>
<td>0</td>
<td>0.00</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure-3.13: Avail the Facility of Internet

The respondents were asked to avail the facility of Internet. 18.89 percent uses at home in the category of professor. 14.44 percent in the category of associate professor use in the university library and 15.56 in the category of assistant professors also like to use in the university library (see Table-3.13).
Internet is the easy way to access the large amount of data, save time and money and obtains an opportunity to consult several experts with a single request.

3.2.14 Internet Search Engines

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Search Engines</th>
<th>Professors</th>
<th>Associate Professors</th>
<th>Assistant Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
<td>%age</td>
<td>Frequency</td>
</tr>
<tr>
<td>1</td>
<td>Google</td>
<td>12</td>
<td>13.33</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>Yahoo</td>
<td>10</td>
<td>11.11</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>Alta Vista</td>
<td>6</td>
<td>6.67</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>MSN</td>
<td>5</td>
<td>5.56</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>Any other</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure-3.14: Search Engines
The Internet search engines especially Google and Yahoo used by the faculty members i.e. 13.33 in professors category and 15.56 percent in associate professors and 15.56 in assistant professors (see Table-3.14).

The Google search engine is mostly used because it is fast in access, regularly updated and links are provided to web sites in the world.

3.2.15 Library Electronic Services

Table-3.15: Library Electronic Resources for Information

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Electronic Resources</th>
<th>Professors</th>
<th>Associate Professors</th>
<th>Assistant Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
<td>%age</td>
<td>Frequency</td>
</tr>
<tr>
<td>1</td>
<td>Electronic resources</td>
<td>31</td>
<td>34.44</td>
<td>28</td>
</tr>
<tr>
<td>2</td>
<td>No opinion</td>
<td>0</td>
<td>0.00</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure-3.15: Library Electronic Resources for Information
The faculty members were asked to indicate the use of library electronic resources for information. 34.44 percent professors, 31.11 percent associate professors and 28.89 percent assistant professors were in favour of electronic resources for information (see Table 3.15).

3.2.16 IT-based Library Sources and Facilities

Table 3.16: IT-sources and Facilities

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Sources</th>
<th>Professors</th>
<th>Associate Professors</th>
<th>Assistant Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
<td>%age</td>
<td>Frequency</td>
</tr>
<tr>
<td>1</td>
<td>Online public access catalogue (OPAC)</td>
<td>14</td>
<td>15.56</td>
<td>13</td>
</tr>
<tr>
<td>2</td>
<td>Web OPAC</td>
<td>13</td>
<td>14.44</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>CD-ROM databases</td>
<td>11</td>
<td>12.22</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>Online local and international databases</td>
<td>9</td>
<td>10.00</td>
<td>3</td>
</tr>
</tbody>
</table>

Figure 3.16: IT-sources and Facilities
IT-based library sources and facilities is liked by the faculty and they are average of it. 15.56 percent use the OPAC service in professor category, 14.44 percent in associate professors and 16.67 percent in assistant professors. CD-ROM databases and online local and international databases was less percentage (see Table-3.16).

3.2.17. Formats to Access

Table-3.17: Formats to Access the Information

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Formats</th>
<th>Professors</th>
<th>Associate Professors</th>
<th>Assistant Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
<td>%age</td>
<td>Frequency</td>
</tr>
<tr>
<td>1</td>
<td>Printed material</td>
<td>20</td>
<td>22.22</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>Electronic and digital material</td>
<td>13</td>
<td>14.44</td>
<td>13</td>
</tr>
</tbody>
</table>

Figure-3.17: Formats to Access the Information

Percentage to use Formats to Access Information

Professors 22.22
Associate Professors 15.56
Assistant Professors 16.67

Printed Material 20
Electronic and digital material 13
The respondents were asked about the formats 22.22 percent like the printed material in the category of professors. Majority of the respondents 14.44 percent like the electronic and digital material (see Table 3.17).

3.2.18 Preference Formats

Table 3.18: Preference of Electronic and Digital Material Formats

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Formats</th>
<th>Professors</th>
<th>Associate Professors</th>
<th>Assistant Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%age</td>
<td>Frequency</td>
<td>%age</td>
</tr>
<tr>
<td>1</td>
<td>HTML</td>
<td>8</td>
<td>8.89</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>PDF</td>
<td>14</td>
<td>15.56</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>Postscript</td>
<td>3</td>
<td>3.33</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Word document</td>
<td>4</td>
<td>4.44</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 3.18: Preference of Electronic and Digital Material Formats

The format which is mostly liked by the faculty is PDF which is rated 15.56 percent and 13.33 in the category of professors and assistant professors. 12.22
percent likes HTML in the category of associate and assistant professors. Very few likes postscript and word document (see Table-3.18).

3.2.19 Convenient to Gather Information

Table-3.19: Information through Electronic/digital Format

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Convenient to gather information in Electronic/digital</th>
<th>Professors</th>
<th>Associate Professors</th>
<th>Assistant Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
<td>%age</td>
<td>Frequency</td>
</tr>
<tr>
<td>1</td>
<td>Easier than printed resources</td>
<td>10</td>
<td>11.11</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>As easy as printed</td>
<td>10</td>
<td>11.11</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>More difficult than printed resources</td>
<td>16</td>
<td>17.78</td>
<td>7</td>
</tr>
</tbody>
</table>

Figure-3.19: Information through Electronic/digital Format

Electronic and digital format information is preferred by associate professors (13.33 percent) and 11.11 percent in the category of professors and assistant professors. Most of the respondents have the opinion it is more difficult than printed resources in the category of professors (see Table-3.19).
3.2.20 Satisfaction with Library Services

Table-3.20: Satisfaction with the Services and Sources

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Satisfaction level</th>
<th>Professors</th>
<th>Associate Professors</th>
<th>Assistant Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
<td>%age</td>
<td>Frequency</td>
</tr>
<tr>
<td>1</td>
<td>Fully Satisfied</td>
<td>12</td>
<td>13.33</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Satisfied</td>
<td>8</td>
<td>8.89</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>Moderately satisfied</td>
<td>11</td>
<td>12.22</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>Dissatisfied</td>
<td>1</td>
<td>1.11</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Very dissatisfied</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The respondents were asked the questions about the satisfaction with the library services and sources a majority of respondents rated that they fully satisfied in professor category i.e. 13.33 percent and 11.11 percent in associate professors and 12.22 percent in assistant professors. There is no respondent which is very dissatisfied (see Table-3.20).
4.1 CONCLUSION

The present study on the “Information Seeking Behaviour: a Case Study of Faculty Members of Social Sciences, Panjab University, Chandigarh” shows that the Information Seeking behaviour may be motivated by a wide variety of needs, including personal, professional, entertainment, etc. The library collection plays a very important role in information seeking. The library collection aware the users about the new information techniques and technology. The collection should meet the needs and requirements of users. The methods and tools for information delivery continue to grow and change dramatically. Progress in information technology has offered today's information seekers different opportunities to access the information resources in variety of formats, including commonly available electronic information sources, such as CD-ROMs, databases, Web-OPACs, and the Internet.

Information seeking behaviour are affected by many factors. Information seeking behaviour is expressed in various forms, from reading printed material to research and experimentation. Faculty actively seek current information from the various sources available in libraries e.g., encyclopedias, journals and more currently, electronic media.

By this study we come to know that how the faculty members of social sciences obtain the information from various sources and what methods they are adopted to get the information and what is the purpose and behaviour to locate the information.

4.1.1 Design of the Study

The study was design to investigate the information seeking behaviour of faculty members of social sciences Panjab University, Chandigarh. It is descriptive survey method of research.
4.1.2 Sample of the Study

The present study was conducted on 100 faculty members from which 90 faculty members responded to the questionnaire. The respondents are faculty members of economic, education, geography, history, law, library science, political science, public administration, psychology and sociology.

4.1.3 Research Tools

Present study was conducted with the help of self prepared questionnaire.

4.1.4 Statistical Techniques

The statistical techniques that have been employed in the study include percentage.

4.2 FINDINGS

The results of the descriptive statistics i.e. frequency counts and percentages are on the issues under concern have been discussed. The findings are as follows:

1. From the questionnaire it has been seen that the majority of faculty members are able to visit the library everyday, weekly and fortnightly.

2. Most of the faculty members spend four to five hours in the library.

3. Social sciences faculty members method of information seeking is discussion with librarian, reference staff of the library and colleagues as their primary information channel. They also like to use Internet. Some like to consult a knowledgeable person in the field and abstracting journals. Some like to review articles and indexing journals.

4. Most of the respondents purpose of information seeking is for preparing class lectures/assignments, updating knowledge and guiding researchers.
5. In the era of Internet still most of the respondents prefer to consult textbooks, general books, reference books and journals.

6. Tools/services they like to use to access the document is library catalogue/OPAC.

7. English and Hindi language is used by them for reading materials.

8. Problem with information seeking faced by them information is scatter in too many sources. Material is not available in the library. Library staff is unwilling for service and information is too vast.

9. Most of the respondents like orientation tour by the library staff and some like individual assistance.

10. 31.11 percent of the respondents use Internet daily.

11. The purpose behind to use the Internet is education and very few use the Internet for entertainment.

12. Most of the faculty members use the Internet in the university library and some like to prefer to use the Internet at home.

13. Google is the famous search engine which is mostly liked by the faculty members.

14. Electronic services specifically used for communication because it saves time and energy.

15. Online public access catalogue and web OPAC is preferred by most of the faculty members.

16. Printed material is still strongly used by the faculty members as compared to electronic and digital material.

17. PDF format is liked by the respondents for electronic and digital material.
18. Most of the faculty members is satisfied with the service provided by the library and very few is dissatisfied.

4.3 SUGGESTIONS

1. Library is a major source of information. The library should provide content services to its readers.

2. Library staff must be aware of how faculty seek information.

3. Knowledge of faculty information needs and information seeking behaviour is imperative for developing valuable collections, and improving facilities and services.

4. Reference librarians should help teachers to improve their information-seeking and find the types of information they need.

5. Faculty members should be aware of current developments in their field.

6. Faculty members should give preference to print as well as electronic form material even in changing ICT environment.

5.1 BIBLIOGRAPHY


**Journal Articles**


**Web Search Engines**

http://www.google.com

http://www.altavista.com

http://www.looksmart.com

http://www.proquest.com
AUTHORSHIP PATTERN AND DEGREE OF COLLABORATION IN LIBRARY MANAGEMENT

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ABSTRACT

The study presents the trends in authorship pattern and authors collaborative research in Library Management with a sample of 12263 articles during the period 2000-2009. Single authored articles are dominant i.e. 8327 (67.90%), the year wise distribution of articles was high i.e. 1412 (11.51%), the mean of relative growth and Doubling Time for the first five year was 0.3362 and 1.5504, The mean value for the overall degree of collaboration for the 2000-2009 is found to be 0.277, majority of the articles are written in English language i.e. 45.51%, the average number of authors per article is 1.41%.

KEYWORDS

Library Management, Authorship Pattern, Collaboration pattern, Scientometric Analysis, Scientometric, Bibliometrics.

INTRODUCTION

Scientometrics is to provide quantitative characterization of scientific activity; scientometrics is branch of library and information science. In 1969, vassily V. Nalimov and Z.M. Mulchenko coined the Russian equivalent of the term 'scientometric' ('nalkometriyas') (Nalimov and Mulchenko, 1969). As the name would imply, this term is mainly used for the study of all aspects of the literature of science and technology. The term had gained wide recognition by the foundation in 1978 of scientometrics by Tibor Brawn in Hungary. According to its subtitle, scientometrics includes all quantitative aspects of the science of science, communication in science, and science policy (Wilson, 2001). Soon after its foundation Nalimov became the consulting Editor. Some other early papers by Nalimov which helped to nature the
nascent discipline of scientometrics include: (1970), Nalimov and Mulchnko (1969 a) and Nalimov et at. (1971).

Application of mathematical and statistical methods of scientific literature (Derek De Solla, 2000); this enables to evaluate the size of scientific production on the assumption that the essence of scientific activity is the assumption the production of knowledge (Garfield, 2000).

The paper consists of five main parts: introduction, literature review, research design, results and discussions, and conclusions.

DEFINITIONAL ANALYSIS

BIBLIOMETRICS

The terms bibliometrics consist of two words namely ‘Biblio’ and ‘Metrics’, biblio means book and metrics means simply measurement.

Bibliometrics is the quantitative treatment of the properties of recorded as bibliometric is the study of use of document and pattern of publication in which mathematical and statistical method have been applied. (Fair Thom 1970).

SCIENTOMETRICS

Scientometrics is a, study of the quantitative aspects of science as a discipline or economics activity. It involves quantitative studies of scientific activities including, among others, publication, and so overlaps bibliometrics to some extent. Whereas scientometrics can be defined as the quantitative study of science and technology. Bibliometrics applied to scientific articles is called scientometrics. (Tague-Sutcliffe, 1992).

SCIENTOMETRIC ANALYSIS

The main currency for an academician is his reputation just as that for the politician is the politics it is the power that commands and that for the business person is the wealth he has accumulated. (Becher, 1989).
LISA

Library and Information Science Abstracts is an international abstracting and indexing tool designed for library professionals and other information specialists. LISA is established in the year 1969 published monthly. It is an International index and abstracting tool. Provides bibliographic coverage for the field of information science as well as more traditional library science, including related areas, such as publishing, online retrieval, and new information technologies. Indexes and abstracts approximately 7,000 publication annually, including over 440 journal and selected conference proceedings, book review and research service, with content from more than 68 countries and in 20 languages.

SCOPE AND LIMITATION OF THE STUDY

Library and Information Science Abstract (LISA) is published monthly. The present study is based on 11 volumes of LISA. The subject Library Management covered under LISA for the period of 10 years i.e. (2000-2009) was taken for the present study. The present study is based on 12263 articles on Library Management covered by LISA. The data was analyzed by using various parameters which is presented in the form of tables and figures.

REVIEW OF LITERATURE

Scientometric is complex of quantitative method which is used to investigate the process of science. According to Kademani and et al. (2005) the key scientometric concepts include: if scientist is renowned personality in this field these specializations will naturally attracts more number of collaborators. Mahapatra and Kaul (1992); Singh (2007); Balasubramanian and Bhaskar, (1984); Kogamuramath, (2001); Kumar, (1984); James, (2008), Deshpande (1997); indicates that the use of analysis of chrolonological distribution show that older documents are less cited than newer ones.

Haridasan, (2007), indicated that the citing half life (median citation age) shows how far back in time one must go to account for the age one half of the bibliographic references published in a journal in a particular year.
Le Minor, (1991), complied an inventory a list of article that subservient to the appearance of the original article refers to as cite article this method has been used expensively in the legal profession and is particularly applicable to scientific literature.

Wilson, (2001) analyzed. It is useful to establish a list of journals mostly cited by the author.

Ojedokun and Owolabi, (2003); indicates that the year wise distributions of citation use an idea about scattering and. expansion of the subject or discipline.

Marklein (1997), carried out study in the specific period how many book and periodicals or articles are distributed in a specific period.

Lehnus (1973); analyzed Authors enrich a subject by their contributions citation analysis studies identify the familiar and prominent authors in the field.

Brace (1999); indicates that the highly cited journals are listed as ‘core journals’ of a specific subject. The core journals are considered as ‘central set of journals, which most clearly reflects the conceptual essence of the research being reported in the discipline.

Mahapatra (1985); carried out study in Further, if the number of articles in a subject doubles during a given period then the difference between the logarithms of numbers at the beginning and at the end of this period must be the logarithm of the number 2. Mahapatra (1985); assessed the Relative Growth Rates (RGR) is a measure to study the increase in number of articles / pages per unit of articles/ pages per unit of time. Teague et al., (1981)

OBJECTIVES

The main Objectives of the present study is

1. To find out the Year wise distribution of publication.
2. To find out the language wise distribution of journal.
3. To find out the Authorship pattern.
4. Relative growth rate and Doubling time of publications.
5. To find out the Degree of authors collaboration.
RESEARCH METHODOLOGY

Quantitative research is widely used in both the natural science and social sciences, from physics and biology to sociology and journalism. It is also used as a way to research different aspects of education. It is applicable to that phenomenon that can be expressed in terms of quantity (Gupta and Singh, 2009)

For the present study quantitative research method is used.

DATA ANALYSIS

Library and Information Science Abstract (LISA) is published monthly. The present study is based on 11 volumes of LISA. The subject Library Management covered under LISA for the period of 10 years i.e. (2000-2009) was taken for the present study. The present study is based on 12263 articles on Library Management covered by LISA. The data was analyzed by using various parameters which is presented in the form of tables and figures.

According to the objectives of the study, analysis and finding of the study are outlined below.

RESULTS AND DISCUSSIONS

1. The year-wise distribution of publication is shown in table no. 1.

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Year</th>
<th>No. Of Articles</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2000</td>
<td>1172</td>
<td>9.56</td>
</tr>
<tr>
<td>2</td>
<td>2001</td>
<td>1308</td>
<td>10.67</td>
</tr>
<tr>
<td>3</td>
<td>2002</td>
<td>1107</td>
<td>9.03</td>
</tr>
<tr>
<td>4</td>
<td>2003</td>
<td>1329</td>
<td>10.84</td>
</tr>
<tr>
<td>5</td>
<td>2004</td>
<td>1412</td>
<td>11.51</td>
</tr>
</tbody>
</table>
Here, an attempt was made to calculate the scholarly publication for the period of ten years. Table-1 and graph-1 presents the year wise distribution of publication.

Figure No. 1. Year-wise distribution of publication

The average number of article publication was 12263 articles per year. In the study, the contribution of earlier five years (2005-2009) was less than the average publications per year. Out of 12263 articles 1412 (11.51%) articles were published in 2004 and 1044 (8.51%) articles were in 2009, which are highest and lowest in ten years respectively.

2: Relative Growth Rate and Doubling Time of Publications is shown in table no 2.

Table No.2: Relative Growth Rate and Doubling Time of Publications

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of publication</th>
<th>Cumulative no of publication</th>
<th>Log₁₀[P]</th>
<th>Log₂[P]</th>
<th>[R(P)]</th>
<th>Mean [R(P)]</th>
<th>[Dt(P)]</th>
<th>Mean [Dt(P)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>1172</td>
<td>1172</td>
<td>-</td>
<td>7.066</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
The Relative Growth Rate [R(P)] and Doubling Time [Dt(P)] of publications are derived and presented in Table 3.2. It can be noticed that Relative Growth Rate of publications [R(P)] decreased from the rate 0.75 in 2001 to 0.089 in 2009. The mean Relative Growth for the first five years (i.e. 2000 to 2004) showed a growth rate of 0.3362 whereas the mean relative growth rate for the last five years (i.e. 2005 to 2009) reduced to 0.1324. The corresponding Doubling Time for different years [Dt(P)] gradually increased from 0.924 in 2001 to 7.78 in 2009.
The mean Doubling Time for the first five year (i.e. 2000 to 2004) was only 1.5504 which was increased to 5.6432 during the last five year (i.e. 2005 to 2009). Thus as the rate of growth of publication was decreased, the corresponding Doubling Time was increased.

3. Language wise distribution of journal is shown in table no.3.

Language is media for communication for authors’. Selection of document depend upon many factors like subject matter, year of publication, country of origin, method of work, language and availability of source matter.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Language</th>
<th>No. Of Articles</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>English</td>
<td>5581</td>
<td>45.51</td>
</tr>
<tr>
<td>2</td>
<td>Swedish</td>
<td>315</td>
<td>2.57</td>
</tr>
<tr>
<td>3</td>
<td>French</td>
<td>1178</td>
<td>9.61</td>
</tr>
<tr>
<td>4</td>
<td>German</td>
<td>1520</td>
<td>12.40</td>
</tr>
<tr>
<td>5</td>
<td>Danish</td>
<td>97</td>
<td>0.79</td>
</tr>
<tr>
<td>6</td>
<td>Chinese</td>
<td>770</td>
<td>6.28</td>
</tr>
<tr>
<td>7</td>
<td>Japanese</td>
<td>935</td>
<td>7.24</td>
</tr>
<tr>
<td>8</td>
<td>Italian</td>
<td>765</td>
<td>6.24</td>
</tr>
<tr>
<td>9</td>
<td>Icelandic</td>
<td>251</td>
<td>2.05</td>
</tr>
<tr>
<td>10</td>
<td>Slovenian</td>
<td>422</td>
<td>3.44</td>
</tr>
<tr>
<td>11</td>
<td>Spanish</td>
<td>348</td>
<td>2.84</td>
</tr>
<tr>
<td>12</td>
<td>European</td>
<td>81</td>
<td>0.66</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12263</strong></td>
<td><strong>100.00</strong></td>
<td></td>
</tr>
</tbody>
</table>
Table no 3 shows the languages of expression with the number of articles. In the current study, 12 languages i.e. English, Swedish, French, German, Danish, Chinese, Japanese, Italian, Icelandic, Slovenian, Spanish and European were found as a medium of scholarly presentation. Majority of the articles with 45.51% (5581 articles) are written in English language.

4. Authorship pattern is shown in table no 4.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>No. of Author</th>
<th>No. of Articles</th>
<th>Total No. of Authors</th>
<th>% of Articles</th>
<th>% of Authors</th>
<th>Community of Articles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>One Author</td>
<td>8327</td>
<td>8327</td>
<td>67.90</td>
<td>48.21</td>
<td>67.90</td>
</tr>
<tr>
<td>2</td>
<td>Two Author</td>
<td>1904</td>
<td>3808</td>
<td>15.52</td>
<td>22.05</td>
<td>83.42</td>
</tr>
<tr>
<td>3</td>
<td>Three Author</td>
<td>723</td>
<td>2169</td>
<td>5.90</td>
<td>18.58</td>
<td>89.32</td>
</tr>
<tr>
<td>4</td>
<td>Four Author</td>
<td>553</td>
<td>2208</td>
<td>4.50</td>
<td>14.78</td>
<td>93.82</td>
</tr>
<tr>
<td>5</td>
<td>Mention Not Author</td>
<td>757</td>
<td>757</td>
<td>6.18</td>
<td>4.38</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>12263</td>
<td>17269</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Authorship pattern of the articles is presented in the Table-4. The study reveals that total of (17269) authors have contributed the 12263 articles leaving the frequencies of author. The average number of authors per article found to be 1.41.

Among 12263 articles, 8327 (67.90%) articles are written by single author and 3936 (32.10%) articles are written by two or more authors. One authored articles comprised highest percentage (67.90%), following two-authored articles (15.52%) of the total 12263 articles. The authorship pattern reveals a remarkable difference between the number of single author and multiple authors. Very less number of articles are written by four authors.

**5. Degree of author’s collaboration is shown in table no 5.**

Various methods have been proposed to calculate the degree of research collaboration. Here, in this study the formula proposed by Subramanyam (1983) has been used.

\[
\text{The degree of collaboration } C = \frac{\text{Nm}}{\text{Nm} + \text{Ns}}
\]

Where,

- \( C \) = Degree of collaboration in a discipline.
- \( \text{Nm} \) = number of multi-authored papers in the discipline.
- \( \text{Ns} \) = number of single-authored papers in the discipline.
Table No 5. Degree of author’s collaboration

<table>
<thead>
<tr>
<th>Year</th>
<th>One Author</th>
<th>Two Author</th>
<th>Three Author</th>
<th>Four Author</th>
<th>Mention not Author</th>
<th>Total</th>
<th>Degree of Collaboration (DC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>864</td>
<td>137</td>
<td>53</td>
<td>23</td>
<td>95</td>
<td>1172</td>
<td>0.198</td>
</tr>
<tr>
<td>2001</td>
<td>942</td>
<td>171</td>
<td>48</td>
<td>33</td>
<td>114</td>
<td>1308</td>
<td>0.211</td>
</tr>
<tr>
<td>2002</td>
<td>806</td>
<td>128</td>
<td>42</td>
<td>38</td>
<td>93</td>
<td>1107</td>
<td>0.205</td>
</tr>
<tr>
<td>2003</td>
<td>912</td>
<td>275</td>
<td>51</td>
<td>46</td>
<td>45</td>
<td>1329</td>
<td>0.290</td>
</tr>
<tr>
<td>2004</td>
<td>928</td>
<td>215</td>
<td>102</td>
<td>86</td>
<td>81</td>
<td>1412</td>
<td>0.303</td>
</tr>
<tr>
<td>2005</td>
<td>933</td>
<td>162</td>
<td>79</td>
<td>72</td>
<td>58</td>
<td>1304</td>
<td>0.251</td>
</tr>
<tr>
<td>2006</td>
<td>830</td>
<td>165</td>
<td>89</td>
<td>64</td>
<td>120</td>
<td>1268</td>
<td>0.277</td>
</tr>
<tr>
<td>2007</td>
<td>905</td>
<td>133</td>
<td>89</td>
<td>65</td>
<td>74</td>
<td>1266</td>
<td>0.241</td>
</tr>
<tr>
<td>2008</td>
<td>572</td>
<td>331</td>
<td>45</td>
<td>68</td>
<td>36</td>
<td>1053</td>
<td>0.437</td>
</tr>
<tr>
<td>2009</td>
<td>635</td>
<td>187</td>
<td>125</td>
<td>57</td>
<td>40</td>
<td>1044</td>
<td>0.368</td>
</tr>
<tr>
<td>Total</td>
<td>8327</td>
<td>1904</td>
<td>723</td>
<td>552</td>
<td>757</td>
<td>12263</td>
<td>0.277(Mean)</td>
</tr>
</tbody>
</table>

In the study of the degree of collaboration during the overall 10 years (2000-2009). But, When we calculate the year-wise degree of collaboration for 10 years, the results arise different. The Table-4 represents the year wise number of multi-authored articles and their degree of the collaboration. In the study, the degree of collaboration of all years is almost same of the mean value as 0.277. The analysis shows that in the span of 10 years, single authored articles are highest and predominant on multi authorship.

SUMMARY OF FINDINGS

- The Year-wise distribution of 12263 articles published from 2000-2009 LISA was seen. Maximum number of articles 1412 (11.51%) were in the year 2004 and minimum number of articles 1044 (8.51%) were published in the year 2009.
- The Relative Growth Rate \([R(P)]\) of publications are derived the mean value of 0.3362 and 0.1324 and mean value for the Doubling Time \([Dt(P)]\) of 1.5504 and 5.6432.
5581 (45.51%) of records are in English language. And less than 81 (0.66%) records are in European language. Language is media for communication authors cites different types of document for writing where it was seen that English is a predominant language.

- Single authored articles are dominant i.e. 8327 (67.90%), followed by two authored 1904 (15.52%) and three authored 723 (5.90%) respectively.

- In the collaborative measures in the field of Library Management. The mean value for the overall Collaborative Co-efficient and Degree of Collaboration for the year 2000-2009 is found to be 0.160 and 0.277.

CONCLUSION

1. The Year-wise distribution of 12263 articles published from 2000-2009 LISA was seen. Maximum number of articles 1412 (11.51%) were in the year 2004.

2. The mean of relative growth for the first five year showed a growth rate of 0.3362 where as the mean for the last five year reduced to 0.1324. The mean for Doubling Time for the first five year was only 1.5504 which was increased to 5.6432 during the last five year.

3. The study reveals that total of (17269) authors have contributed the 12263 articles leaving the frequencies of author. The average number of authors per article found to be 1.41.

4. In the collaborative measures in the field of Library Management. The mean value for the overall and Degree of Collaboration for the year 2000-2009 is found to be 0.277.

5. 5581 (45.51%) of records are in English language. And less than 81 (0.66%) records are in European language.
REFERENCES


