# Editorial Board

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<td>Central Library, Indian Institute of Technology, Delhi</td>
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DEVELOPMENT IN LIBRARY SERVICES WITH THE ADVENT OF ICT BASED PRODUCTS & SERVICES: A CONTINUOUS PROCESS

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ABSTRACT
The basic aim of present study is to highlights how much libraries have been exaggerated with the advent of Information and Communication Technology (ICT) based products & services and their priorities have been shifted to on ICT for instance library automation, digital archives, library 2.0 and library services on mobile phone. By the help of this paper the author has draw his attention towards the innovation & development of ICT and its implications in library services, it create much changes in entire library management system. With the development and application of ICT, the libraries have shifted from the traditional to hybrid library, then automated library, digital archives stages, library 2.0 and mobile phone services. With the effect of these changes, the structure of libraries has also changed in a dynamic way, as in a continuous process.

KEYWORDS: Information and Communication Technologies, ICT based products & services Library Services, Library Automation, Digital Archives, Library 2.0, Mobile Services of Library.

INTRODUCTION
In the era of information explosion, the tremendous amount of information is being generated and transmitted from every corner of the world in the form of print materials, research articles, lectures, presentations video conferencing, technical reports, standards and patents etc. In the early stages of 20th century, libraries were facing the problems, of how to cater and fulfill the users’ demand in minimum span of time. The solution was to adopt the ICT based products & services. To deal with new challenges and increasing demand of users, libraries are reconsolidating; reshaping, redesigning and repackaging their services and information products by incorporating ICT based products & services.

Owing to ICT enabled products & services, libraries have changed the way, in terms of the provision of information services. These products and services are the integration of computer and communication technologies, which can be, apply, to store and disseminate the information. They have changed the traditional practices of libraries in delivery of services (Ahmad & Fatima, 2009). In the present scenario, users can have access to a variety of information and digital archives of libraries from any corner, as well as can get update activities of libraries by the SMS on their mobile phones. It also helps to users to access, manage, integrate, evaluate, create, and communicate with other users more easily than ever; it can made possible by the emergence of library 2.0. The significant developments in ICT have forever changed the way of information gathering, processing and disseminating. The ICT products and services melt the physical walls of library; it has made library without walls or virtual library.
Meaning of ICT

The term ‘Information and Communication Technology’ (ICT) first appeared in the mid 1980s and was defined as "All kinds of electronic systems used for broadcasting telecommunications and mediated communications", with examples including personal computers, video games, cell phones, internet and electronic payment systems and computer S/W etc.

The ICT is made of computer and communication technology. The computer technology is the tool for storing and processing information in digital form while communication technology helps us to transfer and disseminate digital information. Additionally ICT means a variety of technological applications in the process and communication of information. The word ICT is a combination of two words information, communication & technology. Information means knowledge and technology means use of computer & communication. The term ICT can be defined as “the integration of computing, networking and information processing technologies and their applications” (Riyasat & Fatima, 2008).

Thus, ICT means a combination of computer applications’ and communication technology for gathering, processing, storing and disseminating of Information.

Benefits of ICT based products & services: The ICT products & services are beneficial for the libraries in the following ways:
1. It provides efficient and accurate services;
2. It saves the time, space, energy and resources;
3. It helps for controlling the tremendous escalation of information;
4. It assist to provide high quality of services and increases the range of services;
5. It has invented the ways of resource sharing by co-operation and co-ordination;
6. It helps for the betterment of library image by providing better services in modern ways.

OBJECTIVES:
1. Show the dependency of Library services on ICT;
2. Explain the transformation of Library services due to ICT development;
3. Highlight the importance of users' participation in ICT based Library services.

METHODOLOGY:

This paper is based on author’s viewpoint and his working experiences with ICT based products and services in libraries.

These Products & services are responsible for the development in libraries Services

Libraries are always play a vital role as social institution and served as a tangible structure where books, journals, magazines, and all kinds of information sources are available for end users. Both the librarian and users must be physically present in the library in order to exchange the information, available in any format. That’s why the library was called the trinity of staff, user and document collections. Now present scenario has changed with the emergence of ICT based products & services in libraries. The physical walls of libraries are melting like ice melt in open environment.
Development is a continuous process. Every development brings new opportunities in the respective fields. The ICT based products & services have brought a great revolution in the field of education, and libraries are no exception in this context (Kumbhar, 2009). The libraries are considered as heart of every educational & research institution. Owing to these new ICT products & services the library services has been got drastically changed. There are even change in librarianship vocabulary: ‘dissemination’ is being replaced by ‘communication’, ‘database’ by ‘repository’, ‘literature’ by ‘knowledge’, ‘search’ by ‘navigation’, etc (Akintunde, 2004). The present boon of ICT based products & services have a great impact on libraries and the impact is quite perceptible right from the beginning as the libraries started adopting ICT in the form of automation, stage of digital archives, library 2.0, and now we are talking about library services on mobile phones.

LIBRARY AUTOMATION

Library automation was first giant step towards the use of ICT based products & services in libraries. It brings great revolution and save tremendous time of users and library staff for collecting and disseminating information.

The libraries started for automation in middle 1950’s until 1980’s. Library automation refers to use of computers, associated peripheral media such as S/W for automation, magnetic tapes, disks, optical media etc. Library automation makes the provision to provide the ‘right information to right reader at the right time in a right form in a right personal way’ it is the basic aim of libraries. Library automation fulfills the above demand of libraries by providing the library activities as: very efficiently, rapidly, effectively, adequately and economically. Thus, the ICT made possible for automation in libraries (Ahmad & Iqbal, 2009).

Now libraries are using the RFID (Radio-frequency identification) to prevent the theft of library resources. The RFID is the use of an object (typically referred to as an RFID tag) applied to or incorporated into an information product for the purpose of identification and tracking using radio waves. For library automation, there are some open source software available: Evergreen, CDS Invenio, Koha, NewGenLib, PMB, PhpMyLibrary, OpenBiblio as well as many commercial software: SOUL, Alice for windows, Netlib, LibSys etc.

BENEFITS OF LIBRARY AUTOMATION:

It fulfills the implications of Ranganathan’s ‘the five laws of library science’, especially the concept of the fourth law i.e. ‘save the time of the reader’. In addition there many benefits of library automation such as:

1. Oowed to the automation, circulation is one of the most affected area of library services, which saved a lot of time of users as well as staff;
2. Staff can set fine rules only one time and S/w will provide results automatically;
3. With the help of WEBOPAC, users can search information from anywhere at any time;
4. Users can easily do the reservation of library sources;
5. Check out process of library document is very easy or it may be self check out process, so there will be no queue of users in library;
6. Users can do self circulation of library resources;
7. It helps to avoid the theft of library resources with RFID system;
8. It provides the multimedia facility, some automation S/w gives the image of resources in OPAC (such as Alice for Windows S/w).

DIGITAL ARCHIVES

Libraries must provide the best services to its users, in order to meet the user’s requirements, libraries in the past have updated their collections. Nevertheless, in the present scenario, libraries must not only update their collections but also provide better access to information through the new information highways. This can achieved through digital archives. Digitizations in libraries are today’s response towards a faster delivery of information to its users through the digital archives. The concept of digital archives emerges after the rapid advancement of ICT. The advent of digital archives has great impact on libraries. It provides information very speedily to the end users. The digital archives means: collect the information & stored it, in machine-readable format or digital format for dissemination to end users. The digital content can easily reproduce at globally. Digital archives can be as:

**Digital Library:** A digital library is a library in which all collections of a library are stored in digital formats, and anyone can access to this collections without any barrier. The digital content may be stored locally, or accessed remotely via computer networks. A digital library is a highly organized collection of electronic resources.

**Institutional Repository:** An institutional repository (IR) is a web-based database (repository) of any institute’s scholarly materials. Include works of various stages in the process of scholarly inquiry. In addition to published works, an IR may include preprints, theses & dissertations, images, data sets, working papers, course materials, or anything else a contributor deposits. The main task of institutional repository is to collect the scholarly materials to store and disseminate in digital format for widely used.

**Benefits of Digital Archives:** Some basic benefits of digital archives, which are as follows:

1. Ability to provide a large number of users’ at single time access to unique or special collections, this is the most attractive feature of digital archives.
2. Easily accessibility to information and content can be delivered directly to end-users and retrieve remotely.
3. Flexibility of the digital material, since the data is not “fixed”, as with paper or printed text, it is easy to reformat, edits and prints.
4. Providing access to primary material can help to “publicize” the material to other departments and peers, and to demonstrate the importance of the collections.
5. Digital archives are very useful to save the place.
6. It saves a lot of time of the users in searching of information.

**Library 2.0**

The concept of library 2.0 derived from web 2.0. The library 2.0 encompasses a range of new and contemporary products & services of ICT that used for evolving collaborative
The library 2.0 is a loosely defined model for a modernized form of library service that reflects a transition within the library world in the way that services delivered to users. With library 2.0, library services constantly updated and reevaluated best serve library users. The library 2.0 also attempts to harness the library user in the design and implementation of library services by encouraging feedback and participation (Wikipedia, 2010)7.

Michael Casey coined the term “Library 2.0” on his blog LibraryCrunch as a direct spin-off of the terms Business 2.0 and Web 2.0. Casey suggested that libraries, especially public libraries, are at a crossroads where many of the elements of Web 2.0 have applicable value within the library community, both in technology-driven services and in non-technology based services. He described the need for libraries to adopt a strategy for constant change while promoting a participatory role for library users (Arora, 2009)7.

There are some tools and techniques of library 2.0 which are being used by today’s libraries: Blogs, Wikis, Streaming Media, Tags or Tagging, Social Networks, RSS Feeds, Synchronous Messaging, Podcasts, Mashups and etc.

**Benefits of Library 2.0:** Some benefits of Library 2.0 are as follows:
1. CAS can receive in very effective manner.
2. A very quick communication can possible with library staff.
3. Library can easily get users feedback in minimum span of time.
4. It can keep update to library’s users regarding its daily activities.
5. Multimedia data can be accessing by user and able to give feedback.
6. Users can have Chat referencing/ instant messaging with library staff.

**Mobile phone services of the library**

ICT has collapsed all the barriers and promoted fast communication by across boundaries. To cope with the basic challenges of life and responsibilities has informed the invention and the use of information technologies. Before the advent of ICT, communication in the library was possible through notices, circulars etc. in libraries’ notice boards, means users had to come to library to get the update about the library activities. As scientific knowledge has increased, electronic communication systems began to develop. The library can inform through a single SMS on his users’ mobile phones about any new activity. Means it is not necessary come to the library for its users. Therefore, we can say, now libraries are without walls.

With dawn of ICT, libraries may have started exploring the feasibility of its products & services. These would support library-to-user, user-to-library, and user-to-user online interactions. It made possible by Global System for Mobile Communication (GSM). Mobile phones have revolutionized the daily lives of all over the word. The GSM also enhance
library operations. The application of telecommunications to an automated library can bring more efficiency of library services on mobile phones. Libraries are investigating ways to deliver their services to mobile phones so their users can access them any time anywhere. Further mobile phones can be use for sending text message alerts about their reservations becoming available or overdue books (Iwhiwhu & Ruteyan, 2010)\(^\text{15}\).

Moreover, some vendors are having mobile version of catalogue for their customers or announced plans to produce an iPhone-optimized version of their catalogue, such as Sirsi/Dynix and Innovative.

**Examples of Library Mobile Services**

- District of Columbia Public Library iPhone software (dclibrarylabs.org/projects/iphone/)
- Denton Public Library (library.cityofdenton.com)

**Benefits of mobile phone services of libraries:** Some are as follows:

1. Short Message Services (SMS) facilities available on all mobile phones, could be use to create awareness amongst the academic library users about upcoming events and new arrivals.
2. With the help of GPS, users can find the location of multiple branches of the central library.
3. Libraries can provide to access their digital library on users’ mobile phones.
4. Web OPAC on mobile phones; it can help users for searching the information from anywhere.
5. Users can subscribe to RSS feeds using software on mobile phones. When library updates any information, phone will be able to receive the new information.
6. Library S/W can configure as automatically to send text message alerts for hold, overdue materials and reserved resources available.

**CONCLUSION**

The current scenario of world’s libraries are changing very fast by ICT based products & services. The change enforced by ICT, to adoption of products and services of ICT in libraries are robust indicator of this response. It provides a means for overcoming historically intractable problems of isolation and lack of access to information and knowledge, crucial impediments to libraries development. The ICT products and services have reshaped the educational landscape by transforming the content and modes of release of information. Apart from facilitating the global networked ICT, also enhances knowledge creation and innovation.

The modern libraries are using ICT based products and services for their enhancement of services such as library automation, digital archives, library 2.0 and library services on mobile phones etc. As the above discussions to use of ICT based products and services by the libraries, it is the continuous process, and has some distinguish qualities in every stage of development. There is a symbiotic relationship between the library and ICT, such that any development in ICT accelerates library development. In the same vein, any development in the library today can only be through the deployment of ICT.
Thus, exploitation of ICT based products & services by libraries, can be broadly valuable in terms of 4 Es, namely economy, ease, extension (or expansion) and efficiency (Chauhan, 2004). In this modern era, libraries are totally dependent on ICT based products & services to fulfill the hi-tech users’ need.

BIBLIOGRAPHY


INTRODUCTION

In this information landscape, internet is considered as an affluent source of information. The potential impact of this technology on academic and research scenario is not an exception, as it greatly affects the teaching and research environment in higher education system. The internet has brought data communication and information exchange into a new level and justified its existence and potential at online information retrieval platform; by providing access to myriad source of data and wide range of online information resources, faster rate of data transfer, making information searching more efficient and fulfills the diversified need of user. Due to the extensive growth of information in internet, the users of internet are lost in the flood of information. Information seekers need to have basic skills in finding relevant information from the ocean of information. Thus navigation of internet has become one of the most essential literacy skills in the present age. It is important to learn the basic process and techniques of searching the exact information over the internet to improve the search effectiveness of users. Therefore, it is necessary to evaluate the user interface and analyze the searching behavior pattern of end users towards consumption of exact information.

NORTH ORISSA UNIVERSITY: AT A GLANCE

The North Orissa University (NOU) is established in the year 1998 and included in the UGC’s list of Indian universities maintained under section 2(f) of UGC Act 1956, to impart higher education in the tribal base in the northern part of Orissa state. It acts as a
beacon to this region so as to pull up the under privileged youth to the national mainstream of art, culture, science and technology. At present NOU is running with 15 departments (5 departments offering courses in regular mode and 10 departments offering courses in self financing mode). The total strength of student is about five hundreds and total strength of faculty member is fifty. Out of fifty faculty members, thirty six are belong to science department, which is large in number as compare to other departments faculty numbers of the university. So taking these 36 faculty numbers as a sampling size the questionnaire has been distributed among them. However, 27 numbers of faculties who responded to the questionnaire were taken into consideration for undertaking the present study. The central library of NOU is partially automated one and having only print base collections of good numbers of books, journals and reference materials. The Library is not yet subscribed any consortia based e-resources collections.

AIMS AND OBJECTIVES OF THE STUDY

The primary aim of the present study is to investigate and study the web searching behaviour of faculty of Science Departments, NOU. Besides, the study intends to achieve the following objectives:

- To ascertain the preparation of search strategies adopted by the Science Departments’ Faculty, NOU for conducting searches over internet.
- To determine the perceived knowledge and navigational skills for searching on internet.
- To know the different search techniques adopted while searching information on internet.
- To unmask the most favorite and frequently used search engines for information retrieve.
- To ascertain the behavior pattern of the searcher after locating the information.
- To study the purpose of using web information resources and services by faculty members and to know how they incorporate those into their teaching and learning applications.

SIGNIFICANCE OF THE STUDY

The study is based on the information search practices over the internet by the faculty members of Science Department, NOU. The faculty members still depend on print media. They need to get skill for searching on the internet. Thus the present study would put lights on evaluation of user interface, the key tools and techniques used for searching web information and examine the faculties’ information skills, approaches and behavior patterns of the faculty members in this internet age. The findings of such study would reveal the faculties’ understanding about information searching process on internet, by considering those facts, the faculties concerned and the University authority may take appropriate measure to improve their internet surfing skills. However, studies on web searching behaviour of faculties have not been conducted so far. So in this connection, the researcher has tried to get the answer of the following questions.

- What are the facts of the access and use of internet by the faculties?
- Which search engines are used by them?
• What search strategies they have formulated for obtaining information?
• What information skills they possess?
• What key tools and techniques they have adopted while searching information over the internet?

LITERATURE REVIEW

The information searching habits of internet user are multifaceted and the literatures available to them are extremely broad ranging. This broad review includes topics like web searching, use of internet, web information retrieval, evaluation of information quality and so on.

Iran Asefeh Asemi (2005) reports a survey on the search habits of internet users at the Medical University of Isfahan (MUI), a governmental university in Isfahan city, Iran. The study emphasizes to find the search requirements related to the use of internet information. Data were collected by using a questionnaire and follow-up interviews with internet users from five faculties. Results show that all the respondents are using the internet frequently as each of them has been provided the internet connection. It is revealed that the researchers of MUI are getting quality information through the internet. 55% respondents search for scientific information through the internet because the university library has provided access to various databases and online journals for all students and staff. They use the internet in different ways, such as accessing to online journals, downloading software or text, chatting, discussion, E-mail services and for finding related references. It was unveiled that the internet services are normally used for research. Also it is observed that the Google and Yahoo search engines are more widely used compared to other search engines. The analysis reveals that 54% of internet users always find useful information on the internet. 31% of respondents believed that quality information is available on the internet and finally, 35% of the studied population use print, online and offline form of information for updating their subject knowledge.

Moyo (1996) conducted a study to determine the training needs of internet users in an academic environment. Data were collected through questionnaire, which was mailed to a sample of 200 academic staff, among which 164 questionnaires were returned and analyzed. The analysis shows that 71.3% of respondents subscribed and used e-mail facility. The Investigator found that there were under utilization of existing facility due to lack of basic IT skills posses by the academic staff, at present help provided by laboratory staff of the computer center was neither adequate nor effective in assisting academic staff to learn about the existing facility. Overall impact of the facility on academic work in University of Botswana was generally very low.

Islam & Panda (2007) conducted a survey to find out the trends of web-based information seekers at Sambalpur University, India. A structured questionnaire was distributed among the relevant researchers at Sambalpur University in order to ascertain their web searching habits. The finding of the survey revealed that the scholars are spending nearly three hours per week more using traditional library services than they are using the internet and 61 (97%) respondents believe that web-based information or the internet is important for their research work. 90% of the respondents are using the internet to find journal articles
related to their research. With regard to the views of researchers on the performance of individual search engines, 82% respondents like to search through Google search engine.

**SCOPE AND LIMITATION OF THE STUDY**

Taking the above points into our consideration, we have broadcast our studied under the umbrella of following scope and limitation. The present study confine to the faculties of Science Department, North Orissa University for studying their web searching behaviour and approaches over internet. Besides, the study is limited to the Science department teachers only; it does not include other discipline Teachers and students.

**METHODOLOGY**

In the present study, a survey method based on questionnaires technique has been adopted. The questionnaires have been formulated and distributed among the 36 faculty members of the Science Department, NOU irrespective of their gender, designation, educational qualification and age. They have been asked to fill up the same. Among all of them, 27 numbers (75% of total strength) agreed to fill up the questionnaires. Thereafter the Investigation is carried out based on the collective responses which are narrated in the following section.

**DATA ANALYSIS AND DISCUSSION**

**Table-1 Response from the Science Department’s Faculties, NOU**

<table>
<thead>
<tr>
<th>Science departments in NOU(both Regular and SFC department)</th>
<th>Faculty strength in each Department</th>
<th>Number of respondent</th>
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<tbody>
<tr>
<td>Botany</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Zoology</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Physics</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Chemistry</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Biotechnology</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Bioinformatics</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Wild life Conservation</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Remote sensing &amp; GIS</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>MCA</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Number</strong></td>
<td><strong>Percentage</strong></td>
</tr>
<tr>
<td></td>
<td><strong>36</strong></td>
<td><strong>100%</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Number</strong></td>
<td><strong>Percentage</strong></td>
</tr>
<tr>
<td></td>
<td><strong>27</strong></td>
<td><strong>75%</strong></td>
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Table-1 indicates the total number of faculty members in Science departments and the number of faculties who have responded to the questionnaire.

**Table-2 internet Usage**

<table>
<thead>
<tr>
<th>Access to internet</th>
<th>Response rate in Nos</th>
<th>Response rate in (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>27</td>
<td>100</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>27</td>
<td>100</td>
</tr>
</tbody>
</table>
The study reveals that the faculty members of science department, NOU are the serious users in respect to the use of internet. The researcher interpreted it from the above table that all the faculties of Science Departments, NOU are using internet.

**Table-3 Experience on the internet**

<table>
<thead>
<tr>
<th>Faculty’s experience on internet</th>
<th>Response rate in Nos.</th>
<th>Response rate in (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No experience</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Very little experience</td>
<td>02</td>
<td>7.4</td>
</tr>
<tr>
<td>A moderate amount of experience</td>
<td>19</td>
<td>70.37</td>
</tr>
<tr>
<td>A great deal of experience</td>
<td>06</td>
<td>22.22</td>
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</table>

The Table-3 revealed that most of the faculties have experienced on internet in varied way of their perseverance. Among them 19(70.37%) have moderate amount of experience on internet, followed by 6(22.22%) a great deal of experience and 2(7.40%) very little experience. Thus it can be interpreted that majority of them have moderate amount of experience in internet searching.

**Table-4**

<table>
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<th>Purpose of internet services</th>
<th>Response rate of faculty members in number</th>
<th>Response rate of faculty members in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email based communication</td>
<td>27</td>
<td>100</td>
</tr>
<tr>
<td>Article search &amp; download study material</td>
<td>24</td>
<td>88.88</td>
</tr>
<tr>
<td>Reading of news/entertainment and sport</td>
<td>20</td>
<td>74.07</td>
</tr>
<tr>
<td>Personal blog site</td>
<td>03</td>
<td>11.11</td>
</tr>
<tr>
<td>Use social network site</td>
<td>06</td>
<td>22.22</td>
</tr>
<tr>
<td>Video conferencing &amp; chatting</td>
<td>03</td>
<td>11.11</td>
</tr>
</tbody>
</table>

Table-4 depicts the purpose of using internet by faculty members, Science Department, NOU and how they incorporate those into their teaching learning activities. The table indicated all faculties (100%) are using internet for e-mail based communication purpose followed by 24(88.88%) faculties surf the internet for downloading article and study material, 20(74.07%) reading of news/entertainment and sport, and equal number of faculties i.e. 03(11.11%) having personal blog site to visit and used to make chat, and 06(22.22%) share and exchange their idea among academic communities through social network site.

The Investigator interpreted from the above analysis that most of the faculties under survey use the internet for downloading their study materials, and all of them generally using internet for email based communication purpose.
Table-5 Navigate the web

<table>
<thead>
<tr>
<th>Search tools used</th>
<th>Response rate in Nos.</th>
<th>Response rate in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Search Engine</td>
<td>27</td>
<td>100</td>
</tr>
<tr>
<td>Web portal</td>
<td>12</td>
<td>44.44</td>
</tr>
<tr>
<td>Subject Directory</td>
<td>04</td>
<td>14.81</td>
</tr>
<tr>
<td>Meta search Engine</td>
<td>02</td>
<td>07.4</td>
</tr>
<tr>
<td>Bibliographic database</td>
<td>07</td>
<td>25.92</td>
</tr>
<tr>
<td>Other source</td>
<td>16</td>
<td>59.25</td>
</tr>
<tr>
<td>Type the web address/URL in the address bar</td>
<td>13</td>
<td>48.14</td>
</tr>
<tr>
<td>Use a direct link from the home page</td>
<td>09</td>
<td>33.33</td>
</tr>
</tbody>
</table>

The table-5 showed how the faculty members navigate themselves around the web while getting to the site they visit. It is depicted from the above table that all of them i.e. 27(100%) simply put keywords through the search engine’s search box and check the site, followed by 16(59.25%) prefer to use other sources like using direct link from the homepage, referred material links, web guide and social network sites, 13(48.14%) navigate around the web by typing the URL in the address bar, 12 (44.44%) through web portal, 7(25.92%) refers bibliographic database, 04(14.81%) through subject directory, and 02 (7.4%) use meta search engine.

It can be interpreted from the above analysis that all faculties (100%) agreed upon search engine as the key internet media to search information and a majority of 59.25% faculties are searching information through other sources (like online journals, database, direct link to academic website etc.)

Table-6 Search Engines

<table>
<thead>
<tr>
<th>Search engines</th>
<th>Response rate in Nos.</th>
<th>Response rate in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Google</td>
<td>23</td>
<td>85.18</td>
</tr>
<tr>
<td>Yahoo</td>
<td>11</td>
<td>40.74</td>
</tr>
<tr>
<td>Altavista</td>
<td>03</td>
<td>11.11</td>
</tr>
<tr>
<td>Hotbot</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Lycos</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Others</td>
<td>02</td>
<td>7.40</td>
</tr>
</tbody>
</table>

The table-6 gives the details about the preferred search engines which the faculties generally used to with. The finding reveals that Google is the most popular widely used i.e. 23 (85.18%), followed by yahoo 11(40.74%) and AltaVista 03(11.11%) and others type of search engine namely Scirus 02(7.04%).

While analyzing the above table, it can be interpreted that Google and Yahoo search engines are commonly used search engines as compared to others.
Table-7 Search instructions on the search engine’s homepage

<table>
<thead>
<tr>
<th>Read search instructions on the search engine’s homepage</th>
<th>Response rate in Nos.</th>
<th>Response rate in Nos. %</th>
<th>Sections looking for</th>
<th>Response rate in Nos.</th>
<th>Response rate in Nos. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>20</td>
<td>74.07</td>
<td>Advance search</td>
<td>11</td>
<td>40.70</td>
</tr>
<tr>
<td>No</td>
<td>07</td>
<td>25.92</td>
<td>Frequently asked question</td>
<td>06</td>
<td>22.22</td>
</tr>
</tbody>
</table>

The table-7 reflects whether the faculties go through the search instruction or not, which is available on the search engine’s homepage while conducting search on internet. In this connection a majority of 20(74.07%) faculties preferred to read the search instructions on the search engine's homepage while 7(25.92%) stated negatively. Those who read the search instructions are further asked the questions, from which sections they look for search instructions. And the table revealed that a majority of 11(40.70%) refer the advance search sections while 6(22.22%) frequently ask questions/FAQ and rest 3(11.11%) follow the help screen.

Table-8 Search Features Techniques

<table>
<thead>
<tr>
<th>Search features Techniques used</th>
<th>Response rate in Nos.</th>
<th>Response rate in (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truncation</td>
<td>05</td>
<td>18.51</td>
</tr>
<tr>
<td>Proximity operator</td>
<td>01</td>
<td>3.70</td>
</tr>
<tr>
<td>Boolean operator</td>
<td>06</td>
<td>22.22</td>
</tr>
<tr>
<td>String searching</td>
<td>01</td>
<td>3.70</td>
</tr>
<tr>
<td>Known searching</td>
<td>07</td>
<td>25.92</td>
</tr>
<tr>
<td>Open ended</td>
<td>15</td>
<td>55.55</td>
</tr>
<tr>
<td>Phrase searching</td>
<td>06</td>
<td>22.22</td>
</tr>
</tbody>
</table>

The Table-8 reflects which search features techniques are applied by the faculties while conducting search. It is depicted from the above table that 15 (55.55%) formulate their search query by using the Open Ended techniques (namely keyword search, using search engines like Google etc); Followed by 7(25.92%) Known Searching(that is the name of a website, or a specific source title or citation links); Equal number of faculties 6 (22.22%) each, conduct search through Phrase Searching (terms enclosed by quotation mark) and Boolean Searching (combine search term with AND, OR, NOT operators); 5 (18.51%) searches through Truncation (use asterisk* mark to retrieve documents containing variations on a search terms) and Same number that is 1 (3.70%) faculty use Proximity Search (operators like NEAR and FBY (FOLLOWED BY)) and String Searching.
It can be interpreted from the above analysis that the faculty members are acquainted with different search techniques which ultimately lead them to formulate a refined search query and get maximum number of documents relevant to them. Also it is clearly indicated most of them get used to with open ended search techniques.

**Table-9 Importance to narrow a topic according to faculties’ viewpoints**

<table>
<thead>
<tr>
<th>Point of view stated by faculties</th>
<th>Response rate in Nos.</th>
<th>Response rate in %</th>
<th>Limiting search</th>
<th>Response rate in Nos.</th>
<th>Response rate in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Won’t overwhelm by information</td>
<td>01</td>
<td>3.70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focus on specific aspect of the topic</td>
<td>18</td>
<td>66.66</td>
<td>By date</td>
<td>06</td>
<td>22.22</td>
</tr>
<tr>
<td>More easily evaluate the result</td>
<td>06</td>
<td>22.22</td>
<td>By language</td>
<td>08</td>
<td>29.62</td>
</tr>
<tr>
<td>Save the time</td>
<td>10</td>
<td>37.03</td>
<td>By domain</td>
<td>12</td>
<td>44.44</td>
</tr>
</tbody>
</table>

The table-9 indicates the faculties’ viewpoints regarding the importance to narrow a topic and among them 18(66.66%) stated by focusing on specific aspect of the topic; followed by 10(37.03%) viewed for saving the time; 6(22.22%) opined for evaluating the results more easily; and rest 1(3.7%) stated for avoiding overwhelming situation due to occurrence of vast information.

Based on their view points, the investigator further put one query to them regarding their ability to limit the search by date, language and domain wise. The table-9 shows a majority of 12(44.44%) able to limit their search by domain, followed by 8(29.62%) by language and 6(22.22%) by date.

It is clear from the above analysis that the faculty members can limit their search accordingly and narrow down their area of searching to get a higher precision ratio which ultimately gives them relevant amount of precise results/information.

**Table-10 Behavior Pattern of Searcher (faculty) after Locating Information**

<table>
<thead>
<tr>
<th>Successful strategies use to locate information</th>
<th>No.</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Save the webpage as a file</td>
<td>11</td>
<td>40.74</td>
</tr>
<tr>
<td>Copy and Paste the URL for a webpage into document file</td>
<td>09</td>
<td>33.33</td>
</tr>
<tr>
<td>Add the hyperlink to a personal website</td>
<td>03</td>
<td>11.11</td>
</tr>
</tbody>
</table>
Table-10 indicates the behavior pattern of searcher (faculty members, Science department, NOU) after locating information from the web. The table shows that 11 (40.74%) respondents save the webpage as a file; followed by 9 (33.33%) copy and paste the URL for a webpage into document file, 8 (29.62%) add the URL in favorites list or bookmark the webpage, 5 (18.51%) write down notes on paper regarding the URL, 3 (11.11%) add the hyperlink to their personal website and 2 (7.40%) create a note on outlook.

It can be interpreted from the above analysis that most of the respondents have adopted the strategies of saving the webpage as file, copy and paste the URL of a webpage into document or add the URL into favorite list/ bookmark for further references.

**MAJOR FINDINGS OF THE STUDY**

Some of the major findings of the study are represented below:

i. All faculty members of science departments of NOU are serious users with respects to use of internet. All of them (100%) access the internet, but only 6(22.22%) faculties stated that they have great deal of experience with this technology while a majority of 19(70.37%) have stated moderate amount of experience.

ii. All of them generally using internet for email based communication purpose while a majority of 24(88.88%) use the internet for downloading their study materials for their academic pursuit.

iii. All faculties (100%) agreed upon search engine as the key internet media to search information with maximum time whereas a majority of 59.25% faculties are searching information through other sources (viz. online journals, database, direct link to academic website etc.)

iv. A majority of 15 (55.55%) faculties formulate their search query through keyword based search technique, and few of them are acquainted with other searching techniques.

v. A majority of 18(66.66%) faculties stated their viewpoint regarding the importance to narrow a topic by focusing on specific aspect of the topic, where as 10(37.03%) pointed it out for saving time;

vi. The faculty members can limit their search accordingly by date, language and domain wise and narrow down their area of searching to get relevant amount of precise results/information.

vii. After locating information from the web 11 (40.74%) faculties adopt the successful strategies by saving the webpage as file whereas 9(33.33%) paste the URL of a webpage into document and 8 (29.62%) add the URL into favorite list/ bookmark for further references.

**SUGGESTIONS**

The survey and the subsequent analysis of the data and the findings of the study enable the researchers to give suggestions regarding the improvement of web
searching skills of faculty members of Science Departments, NOU. The main suggestions for improvement are as follows:

a. The faculty members should develop their searching skills in terms of the concept identification by adoption of different search techniques. They must be aware about the search query formulations, search techniques and apply it while conducting search.

b. Faculty members should develop their search strategies and carry out search through academic hubs and subject gateways, federated based search engine to narrow down the topic for getting better relevant result.

c. The University should plan to set up web infrastructure and facilities within the campus.

d. University should conduct training program specifically focusing on the improvement of user’s internet skills.

CONCLUSION
Searching on web is an important skill needed to obtain information, thus understanding information searching process is a relevant research issue. Internet searching is usually part of an ongoing quest for more and better information on the topic of interest. The information searching techniques need a methodical training to gain the quality in information searching. It has been observed from the study that North Orissa University does not have e-journal based scientific subscriptions so far. Academia still depends on print media only. Provision of seamless access to the internet facilities is not yet provided to the users. Thus the University authorities should take initiatives to provide web infrastructure and facilities within the campus and simultaneously conducting both formal and informal training program for users to enhance their internet skills, also should take initiatives to prepare list of subject websites which are prime important to users, create link to various free useful online databases and various knowledge societies (both academic and corporate) and it should be added in the library’s website. Initiative should be taken for consortium base e-resources subscriptions that will help users to increase their efficiency level in terms of teaching, learning and research activities.

REFERENCES
3. ASEMI(A). Information Searching Habits of Internet Users: A Case Study on the Medical Sciences University of Isfahan, Iran. Webology, Volume 2, Number 1, April, 2005
INFORMATION SEEKING BEHAVIOR OF THE STUDENTS AT MPKV, RAHURI (M.S): A CASE STUDY

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ABSTRACT

Information seeking behavior Play the vital role for developing library collections, upgrading facilities, and improving services to effectively meet the information needs of users. The present era is an era of information and knowledge revolution. Many electronic resources have been made most available in the libraries. The increase in availability of information on the Web has affected Information seeking behavior. The paper deals with Information Seeking Behavior (ISB) at MPKV Library, Rahuri.

KEYWORDS
Information, Information Needs, Information Seeking Behavior, MPKV University Library.

INTRODUCTION

Information seeking behavior is a broad term which involves a set of actions that an individual takes to express information needs, seek information, evaluate and select information, and finally uses this information to satisfy his/her information needs. Varies factors may determine the information seeking behavior of an individual or a group of individuals. It is, therefore, desirable to understand the purpose for which information is required, the environment in which the user operates users’ skills in identifying the needed information, channels and sources preferred for acquiring information, and barriers to information.

Information seeking is a basic activity indulged in by all people and manifested through a particular way of behavior. It is also an aspect of scholarly work most interesting to academic librarians who strive to develop collections, services, and organizational structures that facilitate seeking of information (Wiberley, 1989). There is a universal assumption that man was born innocent and should actively seek knowledge. ‘Information seeking is thus a natural and necessary mechanism of human existence’ (Marchionini, 1995). Information
seeking behavior is the purposive seeking of 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.

Information seeking behavior 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. Information seeking behavior is expressed in various forms, from reading printed material to research and experimentation. Scholars, students and faculty actively seek current information from the various media available in libraries, e.g. encyclopedias, journals and more currently, electronic media. Abels (2004) mentioned that the frequency of use of the internet in 1998-2000 had greatly increased. At the same time, expenditure on monographs showed steady increase.

DEFINATIONAL ANALYSIS

INFORMATION

“Data value in planning, decision making and evaluation of any programme. 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” (Uttor 1999).

INFORMATION BEHAVIOR

The general model of information behavior needs to include at least three elements: (i) an information need and its drives, i.e. the factors that give rise to an individuals perception of need; (ii) the factors that affect the individuals response to the perception of need; and, (iii) the processes or actions involved in that response (Wilson, 1997).

INFORMATION SEEKING

Information is undertaken to identify a message that satisfied a perceived need (Wright and Guy, 1997); described 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. (Ikoja-Odongo and Ocholla, 2004)

INFORMATION SEEKING BEHAVIOR

The students’ information seeking behavior involves active or purposeful information as a result of the need to complete course assignment, prepare for class discussions seminars, workshops, conferences, or write final year research papers (Kakai et al., 2004).
NEED OF THE STUDY

The present human society is living in an information age and as a consequence, man has become more and more information conscious. More and more people deliberately and consciously seek information and it has become an integral part of human activity especially in the area of education, research and development, production and marketing of goods, all of which have contributed to the improvement of the quality of life. World War I and II accelerated research and development activities resulting in information explosion. The information so produced is recorded and reported in a variety of documents-printed and non-printed documents. The information explosion coupled with multiplicity of documents has created problems to the generators, users, and the organizers of information.

The students of Mahatma Phule Krishi Vidyapeeth, Rahuri (Maharashtra) are expected to optimally utilize the university library as one of their major sources of information. However, observing and conducting studies on library use in the university environment in general establishes the fact that students do not use most of the library information resources. It is assumed that students could be experiencing technical problems in accessing information resources. This coupled with lack of knowledge and awareness of the resources resulting in the students’ poor information seeking behavior was singled out as the biggest cause that needed investigation. Library information resources are expensive. They are costly in terms of their acquisition and retention. The librarians need to manage these resources and make them accessible. To attain cost effectiveness in the university library services and to promote the use of library information resources and services, this study sought to establish ways of improving the information seeking behavior of all students in MPKV Library Rahuri (MS).

SCOPE & LIMITATION OF THE STUDY

The scope of the study is limited to MPKV University Students. The study is confined to Students of MPKV to understand their information seeking behavior. The university environment is of a heterogeneous group comprising Post Graduate Students, Research Scholars and Teaching Faculty in the purview of information seeking channel and instead of covering all the groups of users, all B.Tech, M.Tech, Ph.D students have been taken for the research study. This is the limitation of the study. This is to cover mainly a fair proportion of students representing all the departments instead of becoming a sample representation of a few departments.

RELATED STUDIES

The literature of information seeking behavior of the students and 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 behavior itself and its direct applications to closely related topics such as information seeking.
Information Seeking Behaviour of Faculty Members of Rajabhat Universities in Bangkok. In regard to information seeking behaviour of users in RUs in Bangkok, it is recommended that library staff or reference librarians could use their time in a better way by focusing on assisting users. Reference librarians should help users to improve their skills in information seeking activities and to find the different type of information they need (Paitungkhoo and Deshpande, 2005).

Fulton, Kerins and Madden (2004) report the results of two empirical studies which explored the information seeking behavior of engineering and law students in Ireland. The findings reveal similar patterns in the information seeking behavior between students studying to become professionals and information seeking patterns of these groups.

Osiobe (1988) found that browsing was the most important source of finding references for undergraduate students. He concluded that respondents in the University of Botswana did seek help from University library staff with 40% receiving help from the reference librarian and approximately 32% from the subject librarian.

Suriya, Sangeetha and Nambi (2004) carried out a research work on "Information seeking behavior 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 made by the respondents the majority of the respondents 91 (56.87 percent) made their search by subject.

Shokeen and Kushik (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.

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 newspapers. 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.

OBJECTIVES

The study examined the information seeking behavior of the students in the Mahatma Phule Krishi Vidyapeeth, Rahuri Maharashtra. Precisely, the focus was on obtaining information on the nature of academic information needed by the students, the sources consulted and the general pattern of information gathering system by the students. More specifically, the objectives of the study were:

- To find out the awareness and use of library resources of the students.
- To find out the type of information sources used by the students.
• To ascertain users opinion regarding usefulness and adequacy of information sources and services.
• To know the purpose of seeking information.
• To determine whether or not different kinds of information need leads to different information seeking behavior and communication channels.
• To identify the information searching methods adopted while searching for information in the library.
• To analyze the possible reasons for not using information sources, if any and
• To suggest measures for enhancing the use of information sources, and seeking a synthesis of theoretical elements from information science.

RESEARCH METHODOLOGY & DESIGN
This study used questionnaire-based survey method. The questionnaires were personally distributed to the students of MPKV University at their library and reading room and Library in the month of May 2011. A random sample of 700 students was selected. The questionnaires were distributed to the students who were present in library and library reading room. 575 filled in questionnaires were returned by users with the overall response rate being 82.14%. The collected data were analyzed, classified and tabulated by employing statistical methods.

DATA ANALYSIS
An attempt has been made to analyze the research data collected from students from MPKV and interpret the results revealing their information seeking behavior that provides valuable source of information to the library managers and planners in designing and developing a suitable strategy in promoting the better use of valuable information sources including electronic format and thus justifying the cost effectiveness of library efforts.

RESULTS AND DISCUSSIONS:
The results of the user observations, questionnaire schedule, interviews and participatory design sessions provide a rich description of how information seekers use various information sources, searching methods employed in obtaining desired information and problems of not using information resources, if any. The research study is confined to students of MPKV. Questions like name, Gender and educational qualification were asked.

The data is analysed in view to the objectives mentioned in the study as follows:

SEX RATIO
Sex ratio is the ratio of males to females in a population. The primary sex ratio is the ratio at the time of conception, secondary sex ratio is the ratio at time of birth, and tertiary sex ratio is the ratio of mature organisms.
Table no. 1: Sex Ratio

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Sex</th>
<th>Student</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Male</td>
<td>412</td>
<td>71.65%</td>
</tr>
<tr>
<td>2</td>
<td>Female</td>
<td>163</td>
<td>28.35%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>575</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

It is confirmed that the present study have out of 575 respondents 412 (71.65%) were Male and 163 (28.35%) were female.

AGE GROUP

Human facial image processing has been an active and interesting research issue for years. Since human faces provide a lot of information, many topics have drawn lots of attentions and thus have been studied intensively in that case present study has analyzed the age group of the respondents.

Table no.2: Age Group

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Age Group</th>
<th>Student</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20-23</td>
<td>181</td>
<td>31.48 %</td>
</tr>
<tr>
<td>2</td>
<td>23-25</td>
<td>187</td>
<td>32.52 %</td>
</tr>
<tr>
<td>3</td>
<td>Above - 25</td>
<td>207</td>
<td>36.00 %</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>575</td>
<td>100 %</td>
</tr>
</tbody>
</table>

It is clear from that table no 2 the Maximum user were above 25th age group, that is (36.00%) of the user. 181 user were 20-23 age group and 187 users were age group 23-25 respectively.

FREQUENCY OF VISIT TO THE LIBRARY

Library and Information Centre is a knowledge bank considered to be the heart of the university enriched with variety of information sources and services in print and electronic format to support learning, teaching and research. Attempts were made to understand the habit of using the library by the students in a university. Table 3 showing the frequency of visits to the library.

Table no.3: Frequency of visit to the library

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Frequency</th>
<th>Students</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Every Day</td>
<td>397</td>
<td>69.04 %</td>
</tr>
<tr>
<td>2</td>
<td>2-3 Time in a Week</td>
<td>153</td>
<td>26.61 %</td>
</tr>
<tr>
<td>3</td>
<td>Weekly</td>
<td>18</td>
<td>31.30 %</td>
</tr>
</tbody>
</table>
It is clear from the Table 3 that, all the respondents of the study i.e. Post Graduate students of university area in the habit of using the library. Among them about 397 (69.04%) of respondents visit the library every day, followed by 2-3 times in a week by 153 users (26.61%). And 18 users (31.30%) were visiting the library for weekly. And 07 users (12.20%) were visiting the library by monthly respectively.

**PURPOSE OF USING LIBRARY**

Library should be viewed as an integral part and parcel of every academician to encourage, motivate and support not only learning and research but also to develop ideal citizens of the country. Thus, the purpose of visiting the library is equally important for optimization of respondents’ knowledge to support their educational endeavor. Table 4 shows the purpose of seeking information by the respondents of the study.

**Table no.4: Purpose of visit the library**

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Purpose</th>
<th>Students</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Preparation of Course Exam</td>
<td>127</td>
<td>22.09%</td>
</tr>
<tr>
<td>2</td>
<td>Preparation of Thesis/Dissertation</td>
<td>209</td>
<td>36.35%</td>
</tr>
<tr>
<td>3</td>
<td>Preparation of UPSC/MPSC Exam</td>
<td>412</td>
<td>71.65%</td>
</tr>
<tr>
<td>4</td>
<td>To Collect Course Material</td>
<td>237</td>
<td>41.22%</td>
</tr>
<tr>
<td>5</td>
<td>General Reading</td>
<td>178</td>
<td>32.52%</td>
</tr>
</tbody>
</table>

It is noted from the Table 4 that, about (22.09%) of respondents’ purpose of visiting the library is preparing for course examinations. This is followed by respondents using the library to prepare for competitive examinations (71.65%). And (36.35%) of respondents use the library to prepare the Thesis and Dissertation work and to collect Course Material (41.22%) & general reading (32.52%). Thus general tendency for visiting the library by the students is to prepare for general examinations and prepare for competitive examinations.

**USE OF LIBRARY SOURCES AND SERVICES**

**Table no.5: Use of library sources and services**

<table>
<thead>
<tr>
<th>Sr. no</th>
<th>Services</th>
<th>Students</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Issue/Return</td>
<td>479</td>
<td>83.30%</td>
</tr>
<tr>
<td>2</td>
<td>Reference Service</td>
<td>120</td>
<td>20.87%</td>
</tr>
<tr>
<td>3</td>
<td>Periodicals</td>
<td>207</td>
<td>36.00%</td>
</tr>
<tr>
<td>4</td>
<td>Seminar/Conference Proceedings</td>
<td>53</td>
<td>9.22%</td>
</tr>
<tr>
<td>5</td>
<td>Indexing Service</td>
<td>66</td>
<td>11.48%</td>
</tr>
</tbody>
</table>
Table no 5 shows the use of library sources and services. It was found that majority of students used IT Based Services like that Krishiprabha, CeRA and j-Gate these found in 99.30%. Issue/return of the books these found in 83.30% of users, followed by the use of the Reprography service 81.04% users and use of periodicals, Bibliography, CAS/SDI Service, were marginally used.

**PURPOSE OF SEEKING INFORMATION**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Purpose of Using Internet</th>
<th>No. of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fill up competitive Exam Form</td>
<td>415</td>
<td>72.17%</td>
</tr>
<tr>
<td>2</td>
<td>Face book</td>
<td>378</td>
<td>65.74%</td>
</tr>
</tbody>
</table>
SUMMARY OF FINDINGS

The significant findings of the study are given below:

- All the respondents are in the habit of using the library and more than half of them visit the library everyday and one-fifth visit the library every alternate day and a very negligible portion do not use the library and they are having their personal book collection.
- The observation of all respondents Male is the maximum respondents.
- The age group of respondents is maximum of the users or students are above Twenty five years means master degree holders in Agri.
- The main purpose of visiting the library is to keep up to date and currier development and, followed by preparing for competitive examinations and dissertation work.
- Educational information is the pre-dominantly used information-need for the respondents useful for their academic and research activities followed by employment and job related information.
- All the respondents of the study undertake information searching on their own to meet their desired educational needs.
- Almost all the respondents use internet technology for their academic and research activity and social networking sites.
- The main purpose of using internet is for Fill Up the competitive exam form, research project than for mailing, chatting and entertainment.
- Browsing website and search engines are the most preferred methods for finding information on the internet.
- E-reference books and e-journals are the types of electronic information sources browsed on the internet by the respondents.
- Majority of the respondents are of the opinion that information resources in the university library are adequately stocked.
- More than four-fifth of the respondents indicated the availability of adequate books on competitive examinations.

<table>
<thead>
<tr>
<th></th>
<th>Research Project</th>
<th>208</th>
<th>36.17%</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Collection of Course</td>
<td>88</td>
<td>15.30%</td>
</tr>
<tr>
<td>5</td>
<td>Chatting</td>
<td>49</td>
<td>8.52%</td>
</tr>
<tr>
<td>6</td>
<td>Mailing</td>
<td>11</td>
<td>1.91%</td>
</tr>
<tr>
<td>7</td>
<td>Entertainment</td>
<td>13</td>
<td>2.26%</td>
</tr>
<tr>
<td>8</td>
<td>Don’t Use</td>
<td>2</td>
<td>0.35%</td>
</tr>
</tbody>
</table>

It is seen from the table 7 that, quite surprisingly internet is used mainly for fill up comparative exam form (72.17%) than for Facebook (65.74%) and Research Project (36.17%). However, the other purposes of using internet by the respondents are for Chatting (8.52%), entertainment (2.26%) and mailing (1.91%). Thus the result shows that, research projects, communication and downloading programs are the purposes of using internet.
University has doing one non credit (PGS-501 0.1 Credit) compulsory Course in title “Library and Information Services” according to revised P.G. Syllabi recommended by NCG, ICAR, New Delhi.

SUGGESTIONS:

A holistic view of information seeking process comes near to ideas of inquiry learning. They both emphasize an iterative question-driven process of finding, managing and evaluating information. An additional aspect of inquiry learning is its collaborative nature, which gives rise to a challenge of arranging collaborative situations of information seeking with heterogeneous groups of students. A naïve way of students’ information seeking process emerged through empirical studies. Instead of being a holistic process, it manifests itself in the form of information gathering only, and uncritical acceptance of information. When learning activities are focused on information gathering, such important phases as refining the question, evaluating and synthesizing information, is easily neglected.

The usage of the MPKV University Library, its resources and services needs to be increased. Student oriented information resources such as text books, reference materials, journals, internet facility, database etc., should be facilitated. Importantly, the library should provide exhibition programme and the lecture on use of the library sources and services for every year. And University has doing one non credit (PGS-501 0.1 Credit) compulsory Course in title “Library and Information Services” according to revised P.G. Syllabi recommended by NCG, ICAR, New Delhi.

REFERENCES


EFFECT OF SOCIAL NETWORKS AND ICT USE ON THE PERFORMANCE OF
THE FACULTY MEMBERS OF ENGINEERING COLLEGES IN RURAL INDIA

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ABSTRACT

In this paper, we introduce social network analysis for investigating the effect of Information and Communication Technology (ICT) use on the performance of the faculty in Engineering Colleges in rural India. Here, we highlight the data collection procedure, its benefits and limitations and standard measures of social network data. We first suggest that collection and analysis of relational and attribute data offers richer insights with regards to the investigation of structural effects of network position on performance of Engineering faculty. Second, drawing from theoretical and methodological strengths of previous studies conducted in Social Network, we describe the process for collecting relational data from the faculty members in isolated and rural settings. We primarily discuss two specific types of social network data collection approaches-- (i) whole network and (ii) ego-centric network approach; and highlight its opportunities and challenges. Third, we discuss the problem of network sampling in the context of faculty members in rural areas. Finally, challenges associated with analysing social network data are presented.

Keywords: - Social network, egocentric, sociocentric, rural faculty, performance

INTRODUCTION

Social network studies have gained significant recognition in terms of both theory and method in recent years. Theoretical studies on social networks have greatly impacted various domains such as social capital, knowledge management, and network organisations and so on. Based on the theoretical constructs of sociology, mathematical foundations of graph theory and recent developments in computer hardware and software, social network analysis (SNA) offers a unique methodology for visualizing and investigating social structures and relations. While a general social survey usually allows for studying individuals’ properties as the prime context for explaining outcome, SNA incorporates the social context to explain individual or group outcomes. The relationships between the actors hence become the focus of study and the properties of the actors themselves remain secondary. This paper focuses on the data collection procedure, its benefits and limitations and standard measures of social network data within the context of the knowledge-intensive work of Engineering College’s faculty in rural and isolated settings.

The development of the field of social networks was brought about in the 1930’s by several groups working independently in different traditional fields. Georg Simmel
constructed a theory that explained the causes of social phenomena and contributed towards ‘formal sociology’, which was the predecessor to SNA. In 1934, Jacob Moreno became the first to operationalize a social network by creating a system for representing a social network as a combination of nodes and links.

By the late 1930s, two separate traditions for SNA had developed. The first was the work by a group at Harvard University on ways to find subgroups of people in larger groups. The sociocentric approach developed from this tradition. It involves the quantification of relationships between people within a defined group. The focus is on measuring the structural patterns of those interactions and how those patterns explain outcomes. The second tradition originated from group of anthropologists at the University of Manchester which paved the way for community studies and gave rise to the egocentric approach. They studied the networks of relations surrounding individuals rather than focusing on the whole society. Therefore, with its focus on individuals, it was concerned with making generalizations about the features of personal networks.

SOCIAL NETWORK AND ANALYSIS

A social network is basically a set of actors and relations that hold these actors together. Actors can be individuals or aggregate units such as departments, organizations, or families. Actors form social networks by exchanging one or many resources with each other. Such resources can be information, goods, services, social support or financial support. These kinds of resource exchanges are considered a social network relation, where individuals who maintain the relation are said to maintain a tie. The strength of their tie may range from weak to strong, which depends on the number and types of resources they exchange, the frequency of exchanges and the intimacy of the exchanges. Further, social ties consist of multiple relations (as in the case of teachers who have a teacher - student relationship as well as a friendship relationship) and therefore are called “multiplex ties”.

Social networks can be categorised into one of the two types of networks. One-mode networks consist of a single set of actors. They differ from two-mode networks in that two-mode networks consist of two sets of actors or one set of actors and one set of events. The simplest form of a social network consists of actors and/or events and their connections to each other. The network sociogram presented in Figure 1 depicts the collaboration network of social network authors who have co-authored journals together. The nodes in the network represent the authors (coded in numbers) while the relations (links) show the co-author relationships between the authors. The network is one-mode because it is a co-authorship network only.
The relation in this case is undirected, which means that if author 30 has co-authored with author 35, then the converse is also true. If the relations indicated friendship, then a directed line from actor A to actor B is not necessarily the same as a directed line from actor B to actor A. In the sociogram, author 49 is the most prolific author because he has published the most articles. A simple count of the lines (degree count) indicates that he has co-authored with nine other authors. The component created by the sub graph of author 23, 32, 43, 6, 57 and 25 indicates a clique because the structure shows that each actor within the clique is directly connected to any other node in the sub graph. An interpretation of the clique structure is that the authors were probably interested in the same aspect of the subject of social network analysis which resulted in co-author collaborations and publications.

The use of SNA methods depends on the availability of relational rather than attribute data. It further allows the mapping of relationships between people. This can be used to identify knowledge flows such as who do people seek information and knowledge from? Who do they share their information and knowledge with? An organisation chart, shows the formal relationships such as, who works where and who reports to whom, however a social network analysis chart shows the informal relationships such as who knows whom and who shares information and knowledge with whom. As such, SNA makes it possible to visualize and understand the relationships that may facilitate or impede knowledge creation and sharing. Since SNA allows these relationships to be visible, it is sometimes referred to as an ‘organisational x-ray’ which shows the real networks that operate underneath the surface organisational structure.

CONTEXT OF THE STUDY

The collection of data from a social network is similar to the collection of data from a sample of individuals in any general social survey (GSS). However, one key difference is that in designing a social network survey, relational data is collected along with attribute data. The inclusion of the relational data allows for describing and understanding significant aspects of an individual’s interpersonal and social environment, social participation, and exposure to normative pressures. Analysis of both attribute and relational data (e.g. Ethnic
background and number of social ties in a workforce), which can offer richer insights to explain social outcomes.

The domain of this study is the Engineering College faculty (ECF). In this study, we explore the effect of social network position and ICT use on performance of rural engineering college faculty in India. ECF are geographically isolated from more populated practices. Therefore, nature of their work, isolation from the urban community, and the numerous problems that plague their practice makes this study potentially important. The collection of primary social network data from rural ECF entail problems related to sampling and mode of administration (face to face interviews, mail outs, telephone interview, etc). Problems such as decreasing ECF performance as they age, lack of association with professional peers, keeping up to date with modern technology, isolation from community provide the motivation for an understanding of the interplay between social networks, ICT use and performance of rural ECFs. In this paper, we focus on the phase of collecting social network data from a random sample of ECF’s from rural India. The issues of sampling (general and network) are discussed below.

NETWORK DATA COLLECTION

There are two main approaches to social network data collection – whole network and egocentric network approach. Below is a brief description of these approaches.

Whole or Sociocentric Network Approach

The focus of a whole network analysis is on measuring the structural patterns of those interactions and how those patterns explain outcomes, like the concentration of power or other resources, within the group. The underlying assumption is that members of a group interact more than would a randomly selected group of similar size. Sociocentric network analysts are interested in identifying structural patterns in cases that can be generalised. In a whole network study, the actors of the network are usually known or easily determined. This is because a Sociocentric network study usually focuses on “closed” networks implying that the boundaries of a whole network are a priori defined. Data collection using a whole network approach usually involves listing the names of the actors in the form of an adjacency matrix. For example, in a general practice that consists of 15 faculty members (n=15) including the ECF and the administration staff, a whole network study may be conducted in order to understand the communication network of the practice. A roster of the names of all the workers in the practice will be presented to each of the worker. A simple name generation question such as “In the past two months, who have you communicated with more than twice in a week within the practice in order to carry out your daily task?” Obviously, a definition of what constitutes a daily task will need to be provided to the respondent.

There are challenges for conducting network data collection using a whole network approach in the context of rural ECFs. To conduct a whole network study of the ECFs in rural India would mean that all names of the ECFs would need to be known, which would generate a huge list of names (roster) for recall by the respondent. However, previous studies suggest that scrutinising through long lists of names and identifying the multiple types of ties with
each person on the roster causes fatigue and recall problems. Given these difficulties, we explore the egocentric network approach as an alternative strategy for data collection.

**Egocentric Network Approach**

In the social network parlance, the person we are interested in is referred to as the “ego” and the people referred as his affiliate, advisor, friend, or relative, are known as “alters”. Previous studies explored the professional affiliation and occupational status of 50 Directors of University Libraries and 50 Directors of College Libraries in the UK and claimed that individual attributes affected the characteristics of their social networks to a certain extent. The two professional groups were chosen because of their probability to have well developed networks and because they were the two most important groups in the library community in terms of number and power. The authors stratified their sample according to the Binley’s Directory and randomly selected the Directors for their study. They asked the following name generator question:

*“From time to time, people discuss important professional matters with other people. In the last twelve months, who are the people with whom you have discussed important professional matters?”*

West et al utilised descriptive statistical measures of cross classifications of the different groups to compare the means and the results (from the Pearson’s Chi-square tests) of the socio-demographic attributes such as sex, marital status and education across the two groups. Secondly, they compared the means of the variables across the occupational groups and these variables included age, professional associations, social associations, journals read, network density, degree centralisation and information centrality. A statistical-significance test of the hypothesis that the means were not equal was also conducted. Thirdly, they cross-classified alter’s relative rank and ego-alter tie strength against the occupational group to show (using Pearson’s Chi-Square test) the statistical significances between the two groups. The measures of density, centrality and centralisation were then used to analyse the relational data. Some of the social network measures used are discussed in greater detail in the below section entitled “Social Network Data Analysis”.

The study of the effects of social networks and ICT use on performance of rural ECFs of India builds on the tradition established by Coleman, Katz et al and the methodology utilised by West et al. Burt’s proposal to General Social Survey (GSS) motivates the methodology of this study. Therefore, the study bases its survey instrument on questions provided by GSS, with a few modifications to suit the focus on social networks of rural ECFs. To understand social network effects on performance, both relational and attribute data need to be collected and linked to facilitate analysis. Attribute data will include performance, ICT use, and personal attributes such as age, education, journals read, and memberships of professional and social associations of the ECFs. Relational data includes elicitation of five alters with whom the ECF (ego) discuss important professional matters within a certain timeframe (e.g. past six months), detailed information about each alters, nature of relationship between the ego and alter, as well as the nature of relationship between alters.
The dependent variable, performance, is classified into task based and contextual based performance. Task-based performance includes those activities that are directly or indirectly related to the technical core of ECFs activities. Contextual based performance is defined as behaviours that support broad organisational, social, and psychological environment of the organisation in contrast to behaviours that support the organisation’s technical core.

The use of ICT by ECFs for their task or contextual-based activities, which impacts on any of the constructs of performance is a function of ‘ICT use’ (an independent variable in this study). Additionally, ICT is also considered to support and facilitate social networks by enabling actors to communicate in real time at low cost regardless of geographical location.

GENERAL SAMPLING STRATEGY

Similar to a social survey, sampling remains an important issue in network survey design especially when dealing with a large population. The population in this study is the ECFs of rural India. The teaching practice serves as the sampling unit and their colleagues (their ties) are the observation unit. There are 28 states and 7 UT’s and 640 districts within India totalling 15,180 ECF’s in rural India. These districts serve as a readily available mechanism for both the stratification and clustering of the sample of rural ECFs. A simple estimation of the sample size at the 95% confidence level and at the 5% confidence interval shows that 3070 ECF responses are needed.

The stratification sampling strategy presents two potential issues. Firstly, if the districts are deemed to be the stratum, then we need to consider what constitutes an appropriate sub-sample within each district given the confidence interval and confidence level. Secondly, a simple random sampling strategy of all the 640 divisions is expensive in terms of time and money because the researcher would have to travel to all the 640 divisions across India in order to collect data. The main advantage of conducting a stratified sampling approach is that the data would be more representative of the rural India ECFs because the data would have been collected from a random sample of all the 640 divisions. Further, recent research has shown that online communication provides a more effective and valid measure to collect network data because of the caller’s anonymity especially in sensitive settings. Therefore, the issue of travelling becomes void because the collection of network data from ECFs in rural India will be mostly conducted online.

The cluster sampling strategy remains a more viable option in terms of time and financial cost. Considering each division of general practice to be a cluster, one may choose a random sample of 7-10 divisions amongst the 640 and administer the survey to all the ECFs of that division. The issue with this approach however, lies in the problem of non respondents. Although the ego-centric approach addresses this problem partially in that there is the chance that other ECFs surveyed in the study might nominate the missing ECF as one of his alters, the attribute data of the “missing” ECF pertaining to ICT and performance may not be ascertained.
NETWORK SAMPLING ISSUES

There are some general assumptions that are taken into account in this study to collect social network data from rural ECFs in India. First, the proportion of alters in an ECF’s social network are also members of the population. Second, it is assumed that everyone has an equal chance of knowing someone in a given population. Third, everyone has perfect knowledge about the members of their social network. This is expressed as:

\[ m = \frac{c}{e} \]

Where \( m \) is the average number of alters that respondents know in the subpopulation, \( c \) is the average size of the respondent’s network, \( e \) is the total size of the subpopulation and \( t \) is the total population. The problem with this equation to model sample size is that the assumptions mentioned above are usually not met for all subpopulations.

To account for this problem, Granovetter provides a theoretical framework for which acceptable estimates for very large populations may be generated. The assumption that Granovetter makes is that the average acquaintance volume (\( V \)), (i.e. the average number a respondent knows) can be computed from the calculation of a density of a network. Assuming that the ties are symmetric, and \( Nt \) is the number of ties observed, and \( N \) is the number of actors in the network, density can be calculated as:

\[ D = \frac{2 Nt}{N(N-1)} \]

Now, given that the \( Nt \) ties observed represent two cases of an alter knowing other alters, then the total number of contacts in the network must \( 2Nt \) and the average number per person is \( 2Nt/N \). The average acquaintance volume therefore is embedded in the calculation of density because \( V = (N-1)D \) by simple algebraic manipulation.

Through the calculation of the density estimate, Granovetter statistically proved that using a single large sample, it is feasible to estimate large populations while promising an unambiguous structural estimate with known variance. In fact, he proposes that it is theoretically and methodologically more sound to sample a few large samples rather than many small ones. The following graph demonstrates between the relationship of a given average acquaintance volume, the population size and the estimated sample size required:
Figure 1: Sample size required for 95% confidence limits on network acquaintance volume, 20% error, for population sizes from 100-1,000,000, and true volume (V) of 100, 500, and 1,000. [22]

<table>
<thead>
<tr>
<th>Population Size (N)</th>
<th>Average Acquaintance Volume</th>
<th>Value of n for Which</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>“Typical”</td>
<td></td>
</tr>
<tr>
<td>1,000,000</td>
<td>100</td>
<td>1,382 (7.69)</td>
<td></td>
</tr>
<tr>
<td>1,000,000</td>
<td>500</td>
<td>619 (1.54)</td>
<td></td>
</tr>
<tr>
<td>1,000,000</td>
<td>1,000</td>
<td>438</td>
<td></td>
</tr>
<tr>
<td>10,000</td>
<td>100</td>
<td>105</td>
<td></td>
</tr>
<tr>
<td>10,000</td>
<td>500</td>
<td>138</td>
<td></td>
</tr>
<tr>
<td>10,000</td>
<td>1,000</td>
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</tr>
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<td>100</td>
<td>40</td>
<td></td>
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<tr>
<td>1,000</td>
<td>500</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>1,000</td>
<td>1,000</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Table showing the sample sizes needed to meet 20% Error, 95% Confidence Limits, for \( w=1 \) (ie. No. of Sample(s)) [22]

Using Granovetter’s model confirms that the estimated random sample of approximately 300 ECFs is sufficient. As mentioned earlier, in a whole network study, respondents are asked to identify a list of recognizable names from a given roster. Granovetter suggests that respondents can easily cope with 500 names from large populations. Other studies, however, show that about 150 are most feasible.

**SOCIAL NETWORK DATA ANALYSIS**

The following section describes standard measures of social network data that will be applied in the context of ECFs:

**Network Density**: Network density basically represents the actual number of ties in a network as a ratio of the total maximum ties that are possible with all the nodes of the network. A fully dense network has a network density value of 1, which indicates that all nodes are connected to each other. A network with a density value near 0 indicates that it is a sparsely-knit network. For an undirected graph with \( N \) nodes and \( N_t \) ties the density \( D \) is defined as:

\[
D = \frac{2N_t}{N(N-1)}
\]
**Local Centrality and Global Centrality:** Local centrality measures the number of direct ties that a particular node has, whereas global centrality measures indirect ties as well (i.e. ties that are not connected directly to that node). This said, a node that lies at a short distance between many other nodes is considered as ‘close’ to many other nodes in the network (also termed as ‘closeness’). Freeman has proposed the measure of relative centrality to measure the centrality of a node with respect to the overall centrality of the other nodes in the network. In mathematical terms degree centrality, \( d(i) \), of node \( i \) is defined as:

\[
d(i) = \sum j m_{ij}
\]

where \( m_{ij} = 1 \) if there is a link between nodes \( i \) and \( j \), and \( m_{ij} = 0 \) if there is no such link.

**Centralisation:** Centralisation and density are not only important measures in SNA, but they are also complementary to each other. Density explains the general level of connectedness in a network. Centralisation explains the extent to which the connectedness is focused around a particular node. To measure centralisation in a network, we need to observe the differences in the centrality values of the most central nodes and all the other nodes. Then, to arrive at the centralisation value, we calculate the ratio of the sum of actual differences and the sum of the maximum possible differences. Centralisation is thus defined as:

\[
r = \sum_{i=1}^{g} \frac{[\text{max (Di)} - \text{Di}]}{(g-1)(g-2)}
\]

where \( Di \) is the number of people in the network that are directly linked to person \( i \). The number of actors is represented by \( g \) in this equation.

**Betweenness:** Betweenness measures the extent to which a particular node lies in between the other nodes of the network. Betweenness centrality may be defined loosely as the number of times a node needs a given node to reach another node. Stated otherwise, it is the number of shortest paths that pass through a given node. As a mathematical expression the betweenness centrality of node \( i \), denoted as \( b(i) \) is obtained as:

\[
d(i) = \sum_{j, k} g_{jk}
\]

Where \( g_{jk} \) is the number of shortest paths from node \( j \) to node \( k \) (\( j, k \neq i \)), and \( g_{jk} \) is the number of shortest paths from node \( j \) to node \( k \) passing through node \( i \).

**LIMITATIONS OF SOCIAL NETWORK ANALYSIS**

A real problem with network analysis in the past has been the inability to test hypotheses statistically, because the data are by their very nature auto-correlated, violating assumptions of independence (random sampling) built-in to most classical statistical tests.
With the advent of permutation tests, random graph models, and various multilevel models, however, this is much less of a problem now. Furthermore, respondents are often asked to recall behaviour that took place over a broad period of time in order to capture as much information as possible. Brewer has found that forgetting to name people in recall based elicitation of socio-centric networks is a potentially significant problem when collecting such data. Also, if the time period is too long, or the amount of information too detailed, reliability and accuracy are jeopardised. Some social network analysts express concern that data based on recall, although widely used, may be less reliable than data gathered by observation. In light of this, the quality of social network data based on recall have been systematically studied where it has been claimed that people are generally very inaccurate in reporting on their past interaction with other people. Later studies also confirmed the same findings but added that people also remembered long-term or typical patterns of interaction with other people rather well. Data gathered by self-reporting could explore the influence of other personal variables that cannot be explored when data is gathered by observation.

SUMMARY

This paper provides an overview of the concept of social network analysis in terms of understanding the performance of rural Engineering College Faculty. SNA has gained significant recognition as a methodology in recent years. Combining relational data with attribute data in the social survey, the insights gained from the analyses are richer than the traditional social survey. The two main approaches used to study social networks are sociocentric and egocentric network approaches. While the sociocentric approach is used to study a social network where the boundaries are specified clearly, the egocentric approach is gaining popularity because of its focus on individuals, groups and communities. This approach was utilized in a famous study on the adoption of innovation of a particular drug use by doctors. It was also used to understand the differences in the personal and social characteristics of doctors and nurses in a study in UK. The methods used in these two famous studies drive the methodological design for this study. In the end, issues related to network sampling, data collection and analyses are discussed.

REFERENCES
5. Hanneman, R. A., "Introduction to Social Network Methods".
IMPACT OF INTERNET ON READING HABITS OF THE NET GENERATION COLLEGE STUDENTS

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ABSTRACT

Reading in the 21st century networked society is no longer confined to print reading. The printed publications were the main medium for traditional reading culture. The Internet has come to forefront that changes the traditional reading habits of the readers. People nowadays tend to rely more on electronic-based resources (such as e-books, e-papers, e-zines, e-journals, e-mails, e-videos, e-games, e-images, e-maps, e-cards, etc.) than paper based resources (such as books, newspapers, magazines, journals, letters, snail mails, cards and postcards, pictures, etc.). These electronic sources have, fully or partially, entered in reading habits of the netizens. The youth especially students, who have opened their eyes in full bloom of electronic revolution, adopt these sources most of all. This close association of students and Internet is supposed to greatly influence their reading culture. Therefore, the study has been conducted with the purpose to identify the impact of Internet on reading habits of the Net generation students. The student population belongs to the colleges of the Kashmir Valley, Jammu & Kashmir (India). The survey method was used to conduct the study and questionnaire was used as a data collection tool. The stratified random sampling technique was employed to choose the students. The results of study reveal that Internet has increased access to information, use of foreign sources, contacts with worldwide readers and time spent on reading, and have decreased dependence on print sources, contacts with print sources, reading in local languages and reading of books. Hence, the conclusion can be drawn that Internet is a mixed blessing for traditional reading culture.

KEYWORDS

Reading Habits; Reading Culture; Internet Reading; Web Reading; Online Reading; Electronic Reading; Digital Reading

INTRODUCTION

Reading is one of the oldest habits of human civilization and possibly the only one without a worthy substitute. Reading has been passion of the greatest personalities of all times. Humans have been reading since ages and thus words of knowledge have been passed on through generations. One of the first documentary sources for reading was manuscript, however, accessible to only creamy layer of the society. Later, the arrival of Gutenberg printing press ended such discrimination by making the printed word available to all. The Gutenberg printing press brought drastic changes to the fundamentally oral society of the day. It was certainly a great jump in humanity’s onward march and the beginning of transformation from oral society to reading society. Today, the emergence of the Internet has created an extraordinary change in all spheres of the society. Initially developed for scientific research community by the Department of Defence, United States of America (Cheung & Huang, 2005), Internet has now crossed more than 1.7 billion users. In the first four years, the number of Internet users reached 50 million and, in contrast, it took Radio 38 years, Television 13 years and the Computer 16 years to reach the same milestone (Lallana, 2003). Yet, the global users are embracing this new technology very fast. Although very difficult to measure accurately, according to Internet World Stats (2010), the population of worldwide
Internet users is 1,733,993,741, almost covering 25.6% of the total world population. Interestingly, a significant proportion of the youth especially college students uses the Internet and is potentially the largest group of the Internet users. They are well versed with the new technologies and their application in present networked society and are commonly known as the net/second generation students. The Internet has fixed deep roots in their lives than all other technological innovations. Williamson (2008) reports that out of 18.0 million college students 17.1 million (95.0%) go online at least once in a month during 2007 and out of 18.2 million, 17.4 million (95.7%) use Internet once in a month during 2008 in United States of America (USA). This heavy use of Internet by the students is supposed to greatly influence their reading culture. The predictions are made worldwide that the next generation students may go directly from oral to digital culture and skip over the traditional reading and book culture. However, Internet is a mixed blessing for reading culture and its impact can be positive or negative. The easy availability and accessibility to the reading materials on the Internet is considered as a boon for reading culture and at the same time, the Internet services like online games are considered a threat to traditional print reading. Therefore, there is pressing need to assess the impact of Internet on reading habits.

REVIEW OF LITERATURE

The studies conducted by various researchers and research organisations in different countries also analyse and predict the impact of Internet on reading. Ramirez (2003) and Liu (2005) reveal that with the growing amount of digital information available, people particularly young adults are found spending more time reading electronic materials. Bjork & Turk (2001) conducted a study to identify how Internet is overtaking the print media and conclude that the average respondent use print and Internet equally (50:50), however, heavy use of the Internet drops with age and the population from 35-45 use Internet slightly more than younger and older colleagues. The Hong Kong Department of Education (2001) reports that more students read books at lower levels whilst at higher levels, more students read electronic information. Li-Bi Shen (2006) conducted a study with the purpose to determine the impact of computer technology on college students reading habits and concludes that college students reading habits change from paper-based to Internet-based reading. The findings depict that 83.9% of students read online information everyday whereas only 31.4% of them read newspapers and 33.1% read magazines daily. The China Research Institute of Publishing Science survey finds that the number of Chinese reading traditional books has fallen while the number reading Internet publications has increased sharply. The results discover that book reading rate was 60.4% in 1999, 51.7% in 2003, and 48.7% in 2005, falling 11% in six years. Although the popularity of book reading continues to fall, online reading has grown rapidly, from 3.7% in 1999 to 18.3% in 2003 to 27.8% in 2005 (People’s Daily Online, 2007). Perryman (1997) reports that Americans book reading habits is decreasing as the results of a study show that those who do not read a single book in a year doubled from 1975 to 1990 (8% to 16%). Broddason (2006) argue that there is not only decrease in book reading but overall print reading due to the introduction of Internet. He reports that the percentage of youths reading newspapers daily were 89% in 1968 and in 2003...
it was confirmed that only 40% are daily readers of newspapers. The findings of all the studies reveal that Internet has impacted on reading habits positively as well as negatively.

SCOPE

The scope of the present study is limited geographically to the Kashmir Valley. The Valley is the major province of Jammu & Kashmir state consists of ten (10) districts. Academically, the study is limited to the academic college students of the Kashmir Valley. The student population belongs to the faculties of General Science, Computer Science, Business & Commerce, Social Sciences and Humanities covering the youth age group (18-25 years).

OBJECTIVE

The specific objective of the present study, which is basically a part of Ph.D. study, is to identify the impact of Internet on reading habits of the net generation students.

METHODOLOGY

The population of the universe was large and heterogeneous. Therefore, the stratified random sampling technique was employed to select the students. The data was collected using the questionnaire method. Before drafting the questionnaire, the relevant literature was reviewed and analysed which provided some directions in drafting questionnaire. After the survey questionnaire was drafted, it was pre-tested with 30 students. The questionnaire was then modified according to the result of the pre-test. Later, the data was collected from 302 college students who use Internet. The questionnaire was administered personally to ensure the excellent response rate as well as to avoid any misunderstanding while providing responses. The data is presented in table and then, interpreted and analysed in detailed summary.

DATA ANALYSIS & DISCUSSION

Table 1. Impact of Internet sources on reading habits

<table>
<thead>
<tr>
<th>Impact on Reading Habits</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increases ACCESS to information sources</td>
<td>146/302 (48.34)</td>
<td>156/302 (51.66)</td>
<td>00/302 (0.00)</td>
<td>00/302 (0.00)</td>
</tr>
<tr>
<td>Increases use of FOREIGN sources</td>
<td>137/302 (45.36)</td>
<td>145/302 (48.01)</td>
<td>20/302 (6.62)</td>
<td>00/302 (0.00)</td>
</tr>
<tr>
<td>Increases CONTACTS with worldwide readers</td>
<td>171/302 (56.62)</td>
<td>112/302 (37.09)</td>
<td>19/302 (6.29)</td>
<td>00/302 (0.00)</td>
</tr>
<tr>
<td>Increases TIME spend on reading</td>
<td>70/302 (23.18)</td>
<td>121/302 (40.07)</td>
<td>76/302 (25.17)</td>
<td>35/302 (11.59)</td>
</tr>
<tr>
<td>Decreases dependence on PRINT sources</td>
<td>68/302 (22.52)</td>
<td>144/302 (47.68)</td>
<td>69/302 (22.85)</td>
<td>21/302 (6.95)</td>
</tr>
<tr>
<td>Decreases CONTACTS with print sources</td>
<td>47/302 (15.56)</td>
<td>117/302 (38.74)</td>
<td>103/302 (34.11)</td>
<td>35/302 (11.59)</td>
</tr>
<tr>
<td>Decreases reading in LOCAL languages</td>
<td>78/302 (25.83)</td>
<td>127/302 (42.05)</td>
<td>75/302 (24.83)</td>
<td>22/302 (7.28)</td>
</tr>
</tbody>
</table>
Note: Figures in parenthesis indicate Percentage

ACCESS to information sources

All (100%) the students believe that Internet increases access to information sources in which 48.34% students are strongly agree and 51.66% are agree (Table 1). Certainly, Internet increases access to information sources and bridges the traditional gaps between user and information. The need is to open more Internet access points like cyber cafes, community information centres, and information kiosks at needy places to convert non-users into users and give them unrestricted access to information. Moreover, Internet not only provides access to online information sources but increases access to traditional sources as well through electronic marketing techniques like the Web based Online Public Access Catalogues (OPACs).

Use of FOREIGN sources

The majority of the students (93.37%) also believe that Internet increases access to foreign sources (Table 1). In print media, it was very difficult to access foreign sources as the libraries were mostly building their collection from local sources. In online environment, more foreign sources are available for readers at a click away. This is the prominent reason for increasing the use of foreign sources.

CONTACTS with worldwide readers

The majority of the students (93.71%) also believe that Internet increases contacts with worldwide readers in which 56.62% are strongly agree and 37.09% are agree (Table 1). The communications services (like e-mail, instant messaging), Web 2.0 services (like facebook, MySpace) and ning network services available on the Internet make it easy to communicate with the worldwide readers. The Web 2.0 sources like blogs and wikis also increases the participative reading.

TIME spend on reading

The 63.25% students strongly agree/agree that Internet increases time spend on reading whereas 36.75% strongly disagree/disagree (Table 1). The improved access to relevant information through Internet has increased students time spend on reading. The students retrieve, with a single click, many hits related to his/her field of interest easily and each hit seems to be more useful and interesting than another. The reading of the relevant hits, one after the other, definitely increases time spends on reading. However, it is also possible that students may be doing other things during surfing the Internet like online chatting, playing games and watching videos. All these activities may be responsible for decreasing time spend on reading.

Dependence on PRINT sources

Above 70% of the students strongly agree/agree that Internet decreases dependence on print sources whereas below 30% strongly disagree/disagree (Table 1). The Internet provides access to a wide range of online sources available in any part of globe related to various branches of knowledge and hence decreases dependence on print sources.

<table>
<thead>
<tr>
<th></th>
<th>74/302 (24.50)</th>
<th>139/302 (46.03)</th>
<th>58/302 (19.21)</th>
<th>31/302 (10.26)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreases reading of BOOKS</td>
<td></td>
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<td></td>
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</tbody>
</table>
CONTACTS with print sources

The 54.30% students strongly agree/agree that Internet decreases contacts with print sources and 45.70% students do not feel so (Table 1). The findings make clear that the new generation students depend on online as well as print sources. Therefore, libraries need to build a hybrid collection to satisfy the reading needs of all.

Reading in LOCAL languages

The 67.88% students believe that Internet decreases reading in local languages whereas 32.12% do not believe so (Table 1). The Internet mostly contains information in prominent languages like English, Russian, French, Chinese etc. and very less information is available in regional or local languages. This is perhaps the basic reason that Internet surfers decrease reading in local languages. The authors or copyright owners should publish the local publications in electronic form to reach maximum number of readers. This will definitely increase the sales of their publication. Moreover, it is the need of the day to digitise the best collection of all languages and create a digital library of local material and make it available on the Web for the local readers. In India, the Sahita Academy of India and other state level cultural academies have to play a very important role in this whole process to preserve and develop the local culture in electronic era.

Reading of BOOKS

Above 70% of the students strongly agree/agree that Internet decreases reading of books whereas below 30% are strongly disagree/disagree. The possible reasons are lack of awareness about online book collection; difficult to read a book in a single attempt; unsuitable reading screen; and physical discomforts. There is need to take certain steps to increase book reading during Internet surfing like: to create awareness about book repositories, online libraries and book projects; to create a separate search options for books like Google Book Search in all famous search engines; to digitise the best books from old collection and make them available for users; to have the electronic edition of every new publication available on the Web; to install the book reading software like kindle of Amazon which helps to make online book reading easy and to design the user friendly screens. All these efforts together will help to increase reading of books while Internet surfing.

CONCLUSION

The overall analyses of the data shows that the reading habits of the new generation readers are in transition- slowly shifting:

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restricted Access</td>
<td>Unrestricted Access</td>
</tr>
<tr>
<td>Local sources</td>
<td>Worldwide sources</td>
</tr>
<tr>
<td>Print sources</td>
<td>Online sources</td>
</tr>
<tr>
<td>Local languages</td>
<td>English language</td>
</tr>
<tr>
<td>Individual reading</td>
<td>Participative reading</td>
</tr>
<tr>
<td>Less time spent on reading</td>
<td>More time spent on reading</td>
</tr>
</tbody>
</table>

ACKNOWLEDGEMENT

The author is greatly indebted to my praiseworthy teacher and supervisor, Prof. S. M. Shafi, Head, Department of Library & Information Science, University of Kashmir, J&K.
(India) for his enthusiastic guidance, constructive criticism, sound advices and valuable suggestions during the accomplishment of the present study.

REFERENCES


AGRICAT®eGRANTH: CONSORTIUM ACCESS TO NARS INSTITUTIONAL REPOSITORIES

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ABSTRACT

The paper provides the brief background of the origin of the AgriCat as part of the eGranth Consortium Project under NAIP of ICAR. It elaborates the NARS, ICAR and the components of the NAIP with special reference to the Component-I under which all the important and most innovative web based project- eGranth falls. The importance of this project including objectives and deliverables have been highlighted especially keeping in view of the current scenario of the NARS institutions. It further elaborates the rationale, mission and objectives of the project, the methodologies and over all work programs. The paper explains the purpose and functioning of the AgriCat system and the collaborative aspects with the OCLC and WorldCat. It further elaborates the Search aspects and facilities in the AgriCat and also the Connexion Service of the OCLC through which the data is entered, uploaded and published on to the OCLC under AgriCat of eGranth. The author sum up the paper showing current progress, directions and outcomes of the project and concludes that this web based project has given new directions to the access facilities of NARS libraries and will achieve its goals as per its mandate.

KEYWORDS: e-GRANTH, AgriCat, Connexion, WorldCat, OCLC, NARS, ICAR, NAIP

INTRODUCTION

AgriCat is a Union Catalogue of the holdings of 12 major libraries of the Indian Council of Agricultural Research (ICAR) Institutes and State Agricultural Universities (SAUs) combined together. AgriCat is the part of the eGranth Consortium Project under National Agricultural Innovation Project (NAIP) of the ICAR. AgriCat Libraries are dedicated to offering the access to the widest possible range of resources. People associated with these libraries are able to search each others’ collections and the collections of many other libraries worldwide using WorldCat, the world’s largest network of library-based content and services.¹

So, before discussing further about the AgriCat which is only one of the activities of the eGranth; it is necessary to understand the whole agriculture information systems of the country, i.e. NARS, ICAR, NAIP and eGranth.
NATIONAL AGRICULTURAL RESEARCH SYSTEM (NARS)

NARS is one of the largest systems of its kind in the world, with more than 26,178 full-time equivalent research staff functioning in government, public and higher education institutions and universities. It comprises the ICAR’s 45 national institutes, 17 national research centres, 6 national bureaux, 25 directorates and 4 national institutes with Deemed University (DU) status; one central agricultural university and 46 state agricultural universities. About 93% of the funds for NARS Research and Development are sourced from the government.²

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

ICAR is an autonomous apex body under the Department of Agricultural Research and Education, Ministry of Agriculture, Government of India. Formerly known as Imperial Council of Agricultural Research; it was established on 16 July, 1929 as a registered society under the Societies Registration Act, 1860 in pursuance of the report of the Royal Commission on Agriculture. It is responsible for coordinating, guiding and managing research and education in agriculture including horticulture, fisheries and animal sciences in the entire country. Spread across the country, this is one of the largest national agricultural systems in the world.³

NATIONAL AGRICULTURAL INNOVATION PROJECT⁴

NAIP is world’s second biggest World Bank assisted agriculture project being executed by NARS with a lifespan of six years, started from July 24, 2006 to 2012. The objective of the NAIP is to facilitate an accelerated and sustainable transformation of the Indian agriculture, so that it can support poverty alleviation and income generation through collaborative development and application of agricultural innovations by the public
organizations in partnership with farmers, the private sector and other stakeholders. Among
the 4 components of NAIP, the component I aim at bringing in the organizational changes in
the NARS so that it becomes a dynamic innovation system, capable of responding to the
present as well as the future needs of Indian agricultural research development. The emphasis
Inter alia is on:
1. Strengthening of the ICAR NET
2. Digitized content creation and knowledge management
3. Strengthening of libraries of SAUs and ICAR institutes into the fully electronic
libraries connected over the ICAR Net
4. Formation of an ICAR e-journal Consortium for centralized subscription of e-
resources and information sharing in the agricultural domain at national level, etc.

It is important to mention here that the current web based information systems,
services, networks and library related ICT based implementations, i.e. KrishiPrabha, CeRA,
eGranth, etc. being innovative things; have been supported through NAIP.

Figure 2: NAIP Website

eGranth CONSORTIUM

It provides digital access to library resources of 12 different research institutes and
agricultural universities which include OPAC, important institutional repositories, rare books
and old journals, etc. and makes them publically accessible over Internet under NARS with
Online Computer Library Center (OCLC) partnership. AgriCat is the major activity of the
eGranth Consortium Project and responsible for the Union Catalogue of partner libraries and
making the resources accessible to each other with the help of OCLC, USA. So it is necessary
to comprehensively cover the eGranth Consortium Project.

Summary of the project
1. Title of the project/consortium: Strengthening of digital library and information
management under NARS (e-GRANTH)
2. Lead Centre: IARI, New Delhi
3. Duration of the Project: 36 Months (2009 to 2012)
4. Total Budget: Rs. 853.511 Lakhs

**Consortium Composition**
1. Indian Agricultural Research Institute (IARI), New Delhi – Lead Centre
2. Acharya NG Ranga Agricultural University (ANGRAU), Hyderabad
3. Central Institute of Fisheries Education (CIFE), Mumbai
4. Ch. Charan Singh Haryana Agricultural University (CCSUAH), Hisar
5. CSK Himachal Pradesh Krishi Vishwavidyalaya (CSKHPKV), Palampur
6. GB Pant University of Agriculture & Technology (GBPUAT), Pantnagar
7. ICAR Library, ICAR, New Delhi
8. Indian Veterinary Research Institute (IVRI), Izatnagar
9. Mahatma Phule Krishi Vidyapeeth (MPKV), Rahuri
10. National Dairy Research Institute (NDRI), Karnal
11. Tamilnadu Veterinary and Animal Sciences University (TanuVAS), Chennai
12. University of Agricultural Sciences (UAS), Bangalore

**Rationale of the Project**

NARS has a very large collection of repositories in agriculture and allied sciences, spread all over the country in different libraries, academic institutions, museums, and in authors’ collections. This invaluable heritage has to be documented, preserved and made easily accessible to end users, for which digitization is the solution. Digitization means acquiring, converting, storing and providing information in a computer readable format that is standardized, organized and available on demand. Digital technology opens up a totally new perspective. The World Wide Web holds millions of websites and the Internet is a place for research, teaching, expression, publication and communication of information. The important points as per the rationale of the project are: Services too archaic in the light of ICT revolution, Localized services, Possible duplication of resources, Space limitation for growth, Staff crunch, Staff training, Budget constraints, Poor visibility @ world catalogue, etc.

**Objectives**

1. To create OPAC under Indian Agricultural Research Group Catalogue of all the partner library resources with OCLC partnership
2. To digitize important institutional repositories/resources of leading NARS libraries including rare books and old journals and make them open access under NARS
3. To strengthen capacity building for library and information management system (open to all libraries of NARS)

**Types of Resources under the project as Institutional Repositories**

1. Theses, annual reports, newsletters, success stories, special bulletins, convocation addresses, endowment lectures, faculty/scientists’ profiles
2. Pre-prints, authors’ collections, monographs, handbooks, course curricula, lecture schedules, lecture notes, proceedings of trainings, ppts
3. Important reports of committees, notifications, projects, statistical reports
4. Archives of heritage value such as awards, certificates, visitors’ handbooks, rare photos
5. Digital objects of plant varieties, insects, nematodes, microbes, audio/video recordings, etc.

**Human Resources Development (HRD)**

Training of library professionals and other staff associated with the project includes:

1. Digital library software & OAI-PMH
2. Library automation and WorldCat
3. Digital library content management standards
4. Capacity building of librarians and other professionals on library management with reference to union catalogue
5. Creation, organization and management of online digital libraries and institutional repositories
6. Use of web 2.0 technologies
7. User interaction and web-security
8. Online search services
9. Organizing annual conference cum workshop, etc.

**Deliverables/outcomes**

1. Catalogues of selected libraries is being converted into union catalogue and is now part of WorldCat under the group name “Indian Agricultural Research Group Catalogues”
2. Major selected libraries becoming eGranth or digital libraries with the digitization of most of the institutional resources
3. Most of the librarians under NARS have acquired modern knowledge such as library and information management, union catalogue, Z39.50 server & client, OCLC membership, Web 2.0 and Library 2.0 technologies, digital library and digital preservation, e-publishing, etc. Some of the professionals under the project were also sent to USA for advanced training with OCLC, NAL, etc.
4. The first annual conference of librarians and informaticians of NARS in the lines of CALIBER/NACLIN has already been successfully organized during February 24-25, 2011.
5. The libraries and infolibrarians would be ready to migrate to modern management paradigms with Web 2.0 and Library 2.0 technologies
6. Partner libraries would become at par with world libraries with respect to library and information management, rich with digital resources and web contents
7. Institutional digital repositories
8. Trained librarians in maintenance of digital online library
9. Union catalogues – serials, monographs, dissertations, etc.
10. Website with content management system
11. Open access service provider, etc.

**AgriCat@eGranth**

NARS of India has a very large collection of institutional repositories in agriculture and allied sciences, spread all over the country in different libraries of ICAR Institutes, SAUs, etc. Digitization of these valuable archives would allow online access to researchers, teachers and students to which they would not otherwise have an easy access. Duplication of record creation can be avoided by pooling the efforts through common electronic protocols.

Union Catalogues are useful to librarians, as they assist in locating and requesting materials from other libraries through interlibrary loan service. Subscription to Online Computer Library Center (OCLC), USA would enable partner libraries to be discoverable by the network of global library system and sharing of online resources more effectively. Keeping in view of these points in mind, AgriCat was planned as part of the eGranth Consortium project.

The Consortium has obtained the OCLC membership and user IDs and passwords to access WorldCat and Connexion for cataloging and batch uploading of data to OCLC. Over 600,000 records have been uploaded so far for processing. This has resulted in the Union Catalogue or Group catalog known as “Agricat”.

AgriCat is a Union Catalogue of the holdings of 12 major partner libraries of the ICAR under eGranth Consortium Project with Headquarters at IARI, New Delhi. The data is being contributed to OCLC in standard MARC II format for the preparation of union catalogue of NARS. AgriCat is fully financed by the eGranth Consortium and is being executed with arrangements from OCLC. It is a sub set of the world’s largest union catalog – WorldCat. Under the “Related Link”, a hyperlink has been provided to AgriCat as “eGranth”. Accessions of the partner libraries may be searched in AgriCat using powerful search engine of WorldCat. Records in AgriCat are fully complying with MARC II standard, better searchable and their cover page view gives the look and feel of a document. It offers the access to the widest possible range of resources and the people associated with these libraries are able to search each others’ collections and the collections of many other libraries worldwide using WorldCat.
Although WorldCat has a global reach, one would always see information about AgriCat collections and links to its services up front. Everything you need is displayed right within the WorldCat record, including location and availability of information for the item, and prominent button links to direct view of electronic contents such as the full text of an article.

One may also see special links to some of the online services just below the WorldCat record, preceded by the phrase "Services from AGRICAT Libraries." These links are relative to the displayed items, so the linked page provides a service for the items, one may be currently viewing.

These features of the WorldCat interface are useful for AgriCat users:
1. A "Refine Your Search" box that helps you narrow a large set of results
2. A free WorldCat user account that allows you to create a personal profile; build private and public lists of library items; and contribute reviews and notes to WorldCat records

How to search AgriCat

One can use simple keywords as one would use on a Web search site. One may try using words from a title; the name of the author, artist or director; or words that describe the subject matter.

Search results are presented in this order:
1. Resources owned by AGRICAT Libraries;
2. Resources available through AgriCat sharing relationships with other libraries, if your library belongs to a group;
3. Resources owned by all other WorldCat libraries globally.

Results within each of these groups are ordered by relevance. Note that global WorldCat results may include many resources not owned by AGRICAT Libraries. You may
be able to obtain these items from a nearby library or through their resource-sharing network - click the "Request Item" button on the WorldCat record.

**Figure 4: AgriCat Search Interface**

OCLC, WorldCat and AgriCat

OCLC Inc. is a nonprofit, membership, computer library service and research organization dedicated to the public purposes of furthering access to the world’s information and reducing information costs. Founded in 1967 as the Ohio College Library Center, OCLC and its member libraries cooperatively produce and maintain WorldCat, the largest online public access catalog in the world.8

**Figure 5: OCLC Website**
WorldCat is a union catalog which itemizes the collections of 72,000 libraries in 170 countries and territories which participate in the OCLC global cooperative. It is built and maintained collectively by the participating libraries. WorldCat is the world's largest network of library content and services. WorldCat libraries are dedicated to providing access to their resources on the Web, where most people start their search for information. WorldCat.org lets you search the collections of libraries in your community and thousands more around the world. WorldCat grows every day with the efforts of librarians and other information professionals.  

OCLC Connexion Service and AgriCat

Connexion is OCLC’s flagship cataloging service, a powerful, flexible, easy to use suite of tools with built-in access to WorldCat. The eGranth Consortium uses this service for its data entry, upload and corrections for directly publishing on the OCLC’s WorldCat.

Libraries use Connexion to create and edit quality bibliographic and authority records; to help users find the materials they need faster, and share records with the entire OCLC cooperative to the benefit of libraries around the world.
Figure 7: OCLC with Connexion Interface

CONCLUSION

The eGranth is a dream project of the NAIP and one of the most important web based agricultural information systems and services for the NARS users, Libraries and Librarians and have so far been most successful, starting with the NATP (National Agricultural Technology Project)\textsuperscript{11} model. The mission and objectives of the eGranth and its AgriCat component are being achieved especially as far as libraries, librarians, web based systems and services under NARS are concerned. The practical outcomes have started coming from all the point of views of the project and it has given new directions to the access facilities of NARS libraries and will achieve its goals and new heights as per its mandate in the time to come.

REFERENCES


    http://www.icar.org.in/files/ar0304/14-NATIONAL%20AGRICULTURAL%20TECHNOLOGY%20PROJECT.pdf
INFLUENCE OF INFORMATION COMMUNICATION TECHNOLOGY ON LIBRARY SERVICES
A SURVEY OF PEC LIBRARIES OF INDORE (M.P.)

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ABSTRACT
Information Communication Technology provides a gigantic area to Library and Information Centers. It develops their collection and services on the click of mouse. Changing user’s need force LIS professional to be change. New services include access to internet and internet based tools and services, access to electronic information sources and digital library of local and institutional documents. This reading helps to investigate the ICT skills and its use by LIS Professionals of the Private Engineering Collages of Indore city. Through this study we enable to look into the ways in which the Library Professionals are using ICT in PEC libraries, identify problems the Library Professionals faced in the use of ICTs and enable to find the needs of ICT training in Library Professionals in PEC libraries. This article comes across the current ICT facilities in Private Engineering collage libraries of Indore City. Journals, books, dissertation and theses, course material and patents are some of important sources of information that are now available in electronic form. Digital libraries provide local contents in the electronic form through internet to global clients.

Key words: ICT, ICT based services.

1.1 Introduction:-
Libraries have undergone considerable change in the past decade. With increasing use of technology to organize and disseminate information, the ICT has become an important tool for accessing information. Libraries not only have to provide the technology necessary for patrons to use their OPACs, but also must supply a means for access to scholarly digital
resources and a growing number of electronic databases. The physical space in libraries has been modified to accommodate the additional technology necessary to provide patrons with the tools to use library resources successfully and to meet their information needs. The librarian’s role has changed rapidly in recent years, in response to new forms of information and new methods of teaching and learning. Increased patrons numbers have spread existing staff more thinly; widening modes of access have brought in more part time patrons; more patron centered learning demands a greater variety of teaching skills; and the explosion of electronic information (from CD-ROM to the Internet) requires continuous updating of knowledge and skills. Academic libraries are facing many challenges posed by the contemporary environment, most of which are the result of ICT and digital revolution.

1.2: Objectives of the study:

1. To find the use of ICT skills by the LIS professionals in PEC libraries.
2. To Know the ICT facilities provided to the LIS professionals in PEC libraries.
3. To observe the Purpose of Using the Internet by the LIS Professionals in PEC libraries.
4. To identify the Use of Internet in library In-house operations and Services provided by the libraries of PEC libraries.
5. To comprehended the Problem in Accessing ICT by LIS Professionals.
6. To know about LIS Professionals satisfaction with the current state of internet to support the library activities and services by their administrator

1.3: Scope of the study:

The area covered in this study is confined to Library Professional of Private Engineering collages of Indore City. Information about number of Engineering Collages is collected from the Website of Rajiv Gandhi Technical University. There are 33 Private Engineering Collages in Indore City on the Website of RGPV on date 11/4/2009. There are 70 questionnaire send to LIS professional of engineering collages of Indore. It includes all categories of professionals in the study. 60 questionnaires receive from LIS professionals. The study did not compare the ICT facilities among different Engineering collages Libraries. The study did not attempt to compare the ICT Skills of the librarians by gender wise and the nature of management.

1.4: Literature Review

Batiancila\(^1\) (2010) says in his study that the development of professional competencies may enable us to work efficiently and be able to survive in the new world of libraries and information services. Thus, the development of core competencies are about our skills, knowledge, and personal attributes that contribute to individual's success.

Buarki and Hepworth\(^2\) (2009) have provided insights, suggestions, and recommendations into the development of students. ICT skills, training, curriculum, the job market needs and the factors affecting the development of ICT skills negatively or positively. Other related issues were also presented to complement the main themes.

S.P. Singh and Pinki\(^3\) (2009) have discussed the impact of emerging changes on academic libraries. It discusses the need for acquiring core competencies and new skills to
manage the modern day academic libraries. It further discusses different sets of skills (generic, managerial and professional skills) required by LIS professionals to manage the contemporary change brought up by technology accelerated environment. The article emphasizes that acquisition of new sets of skills has become essential to survive in this technology-based environment.

Antherjanam and Sheeja\textsuperscript{d} (2008) state the effectiveness of communication technology depends how well it provides its clients with information rapidly, economically and authentically. Studies have been done to find the impact of ICT on different sections of CUSAT library by observing the activities of different sections; discussions with colleagues and visitors; and analyzing the entries in the library records.

Minishi- Majanja, Mabel K.\textsuperscript{5} (2007) emphasized that the problems are to be found in the overall ICT policy and infrastructures both at national and institutional levels as well as the lack of sustained funding, appropriate equipment, expertise and management.

Mahaputra, G.\textsuperscript{6} (2006) reveal that the librarians of 21st century have to prepare themselves suitable for working in network environment and should also acquire necessary skills such as leadership; exploiting information handling; communication, crisis management, team building and decision making, etc. So, the library professionals are in dire need to acquire the relevant skills and expertise to track the world of information and become competent enough to serve in a digital culture. The paper also stresses the needs of revised course contents and allied challenges for readiness of Indian LIS education in digital era.

2.0 **Meaning of Information Communication Technology**

UNDP defined ICT as: ‘ICT is basically information handling tools- a varied set of goods, application and services that are used to produce, store, process, distribute and exchange information. They include the ‘old’ ICT of radio, television and telephone and the ‘new’ ICT of computer, satellite and wireless technology and the Internet. With the appropriate content and applications, these tools are now able to work together and combine to form a ‘Networked world’- a massive infrastructure of interconnected telephone services, standardizes computing hardware, the internet, radio and television- which reaches into every corner of the globe.

2.1 **Impact of Information Communication Technology on Library and Information Centers**

It is a genuine fact that every development makes an impact on library and information service. The ICT has also made impact on library and information services. This age is being termed as Information Age, Information Explosion, and Paperless Society. In the field of library and information service ICT technology includes computers (computer hardware and software), computer networking, telecommunications, internet including WWW, search engines, computer and networking security, computer software methodologies, software engineering, scanner, digital camera, photocopier, network authentication and access control, automated language processing, automatic text retrieval, data base management system, relational DBMS, artificial intelligence, library automation system, etc.
2.2 Library Services through Information Communication Technology

2.2.1: Data Processing
Processing of Data is any process that uses a computer program to summaries, analyze or otherwise convert data into usable information. The process may be automated and run on a computer. In the data processing libraries can do Data Entry, Data Coding, Data Transformation, Data Translation, Data Summarization, Data Aggregation, Data Validation, Data Tabulation, Statistical Analysis, Computer graphics, Data Warehousing, Data Mining

2.2.2: CD Rom Searching
The CD-ROMs coming along with books are assigned accession numbers and are kept at the computer section to be issued to the users to get information whenever needed. Library has also subscribed to CD ROM database provides for online Access.

2.2.3: On-line Networking
Networking is one of the most effective ways of serving users’ needs comprehensively. Networked access to databases would help get newly-published information to library users.

2.2.4: On-line Information Service
Online Information services are anticipatory or responsive. Both these services promote the use of library materials, make available library materials to users and thus meet user requirements. The various services include News Paper clipping, Abstracting/Indexing Services, Current Awareness Services, translation services, referral services, photocopying services and computerized services.

2.2.5: News Clipping Scanning service
Newspaper Constitute an important source of Information as they contain the latest information in the form of news with, often daily, updating. Print media is useful for research needs but many organization and individuals are turning to online newspaper clipping services and some are organization do this by their library.

2.2.6: On-line Reservation Service
The Online Reservation Service allows you to reserve books and journals which are on order, being processed by the Library or on loan to another reader. User can place a reservation at the Issue or Information Support Desk using the request option on the on-line catalogue.

2.2.7: Database Searching Service
Through this service, we regularly provide the users with the exact information they need, depending on their interest profile, from our collection of major national and international databases (retrospective and current) on our subject. The databases are in CD ROM or computerized form which saves their valuable time and energy, as the information available here is pinpointed and readily accessible.

2.2.8: Audio-Visual Service
Audiovisual materials are important sources of information, education and entertainment. Many libraries particularly media libraries and large academic and public libraries hold audio visual material such as DVD, films, pictures and photographs etc. Libraries allow their members to borrow these. Recent developments in storage media,
compression and encryption technology have made it possible to store large amount of multimedia documents on hard disk and disseminate through internet.

2.2.9: Internet Access

The use of the Internet around the world has been growing rapidly over the last decade. Libraries provide free or controlled access to internet and email. Depending upon the availability users can be given time slots for use of internet facility. Usually internet enabled terminals are provided in the library that can be used for internet access and email etc.

2.2.10: E-Query Services

E-Query Service is a Web-enabled contemporary reference service offered to the registered members of the Library together handle queries received in person or by e-Mail. E-Queries may sometimes need to be followed-up with telephone, fax, regular mail, or personal interactions. Library, appropriate and brief information gathered in response will be sent to the enquirer through e-Mail within three consecutive working days from the date of receipt of the query.

Table 1: ICT facility in PEC libraries

Information Communication Technology is an important part of current age Libraries. So this question will helps to know the infrastructure of Information Communication Technology facilities provided to PEC libraries of Indore city.

<table>
<thead>
<tr>
<th>S.</th>
<th>Particular</th>
<th>Yes</th>
<th>No</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Libraries having Computers with Internet</td>
<td>55</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Libraries has an independent library network</td>
<td>37</td>
<td>19</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Using Barcode Technology in the library</td>
<td>40</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Libraries network include in CD-ROM etc.</td>
<td>27</td>
<td>31</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Libraries participating in library consortium</td>
<td>15</td>
<td>40</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Libraries are using software packages</td>
<td>47</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>Subscribing E-Resources</td>
<td>44</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>Lib. having Computers with Internet</td>
<td>55</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>Lib. has an independent library network</td>
<td>37</td>
<td>19</td>
<td>4</td>
</tr>
</tbody>
</table>

According to the above table every library of engineering colleges of Indore city having computer and most of them having the internet connectivity. 37 out of 60 libraries of engineering colleges of Indore city have an independent library network. 40 out of 60
colleges of the Indore city are using Barcode technology in the library most of the libraries (40 out of 60) are not participating in library consortia. So many LIS Professionals of engineering colleges of Indore city are aware for the library software packages and most of them are using some software packages in their libraries. Mostly LIS Professionals of engineering colleges of Indore city are aware for the Electronic Resources and most of them are aware for freely available newsletters/journals related to tech/management science.

**Table 2: Stage of Library automation**

Without ICT there is no automation possible Library automation is essential part to know the ICT facilities available in library through this question researchers will be able to know about the stages of library automation.

<table>
<thead>
<tr>
<th>S.</th>
<th>Stages</th>
<th>Quantity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fully Automated</td>
<td>28</td>
<td>46.67%</td>
</tr>
<tr>
<td>2</td>
<td>Partial Automated</td>
<td>21</td>
<td>35%</td>
</tr>
<tr>
<td>3</td>
<td>Just in process to start</td>
<td>11</td>
<td>18.33%</td>
</tr>
<tr>
<td>4</td>
<td>No Chance at present</td>
<td>00</td>
<td>00%</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>60</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Above chat shows that most of the engineering college libraries are complete automated. 46.67% of the engineering colleges are completely automated. 35% of the engineering colleges are going to be automated and some of the engineering colleges are just in process to start the library automation.

**Table 3: Frequency of Using Internet**

Internet has changed the conditions of working in the library. Librarians, assistant librarians and other LIS Professionals should aware about this technology. This question helps to know about LIS Professionals frequency in using internet.

<table>
<thead>
<tr>
<th>S.</th>
<th>Frequency</th>
<th>Using by Person</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Daily</td>
<td>50</td>
<td>83.33%</td>
</tr>
<tr>
<td>2</td>
<td>One in two days</td>
<td>05</td>
<td>8.33%</td>
</tr>
<tr>
<td>3</td>
<td>One in a week</td>
<td>02</td>
<td>3.33%</td>
</tr>
<tr>
<td>4</td>
<td>Twice a week</td>
<td>00</td>
<td>0%</td>
</tr>
<tr>
<td>5</td>
<td>Occasionally</td>
<td>03</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>60</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
Above table shows that most of the LIS Professionals who are working in engineering colleges are aware for the internet. 83.33% LIS Professionals are using internet daily, 8.33% of them are using one in two days, 3.33% of them are using one in a week, 5% LIS Professionals are use to aware for internet when they need or occasionally.

**Table:4: Satisfaction about Internet facility available in PEC library**

Satisfaction is improves work quality. There for it necessary to know about satisfaction for LIS Professionals towards internet facility available in their libraries.

<table>
<thead>
<tr>
<th>S.</th>
<th>Particular</th>
<th>Respondent</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fully Satisfied</td>
<td>45</td>
<td>75%</td>
</tr>
<tr>
<td>2</td>
<td>Partially Satisfied</td>
<td>12</td>
<td>20%</td>
</tr>
<tr>
<td>3</td>
<td>Least Satisfied</td>
<td>01</td>
<td>1.67%</td>
</tr>
<tr>
<td>4</td>
<td>Unsatisfied</td>
<td>02</td>
<td>3.33%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60</strong></td>
<td><strong>100%</strong></td>
<td></td>
</tr>
</tbody>
</table>

According to LIS Professionals of engineering colleges in Indore city, they have sufficient internet facility in the library. 75% of the librarian professionals are fully satisfied with internet facility providing them, 20% of them are partially satisfied by them, 1.67% of the LIS Professionals are least satisfied and 3.33% of them are unsatisfied by the internet facility of the library.

**Table: 5: Types of Information on the Internet**

Internet provides various approaches to satisfied information needs. Through this question researcher observe the type of information needs in searching information on internet.
Above table shows that the 45% of the LIS Professionals are using the internet for current information, 6.67% of them are using for retrospective information, 10% of the professionals are using audio visual information from the internet and 21.67% of the professionals are using internet for the course oriented information.

Table: 6: Preference Techniques for search information from the Internet

There are various techniques for search information on internet. Through the question, researcher will be able find the most preferable techniques of LIS Professionals in using internet.
Above table shows that 45% of the LIS Professionals are use to search information by the advance search techniques, 6.67% of the professionals are using for Boolean search, 10% of the professionals are using key word search and 21.67% of the LIS Professionals are use to search internet by the title search techniques.

**Table: 7: Purpose of Using the Internet**

Computer technology and internet technology has become essential part of libraries. So this question helps to know about purpose of using computer and internet in libraries.

<table>
<thead>
<tr>
<th>S.</th>
<th>Particular</th>
<th>Respondent</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To update yourself with current</td>
<td>31</td>
<td>51.67%</td>
</tr>
<tr>
<td>2</td>
<td>To update yourself in latest</td>
<td>16</td>
<td>26.67%</td>
</tr>
<tr>
<td>3</td>
<td>Helpful in the Research Work</td>
<td>05</td>
<td>8.33%</td>
</tr>
<tr>
<td>4</td>
<td>Improved professional competence</td>
<td>08</td>
<td>13.33%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>60</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

**Fig.:7**

According to this table most of the (51.67%) LIS Professionals are using internet to update ourselves with current information. 26.67% of the professionals want to keep update ourselves with latest technologies. Internet is using by some (8.33%) LIS Professionals for research work and 13.33% of the professionals wants to improve our professional competence.

**Table:8: Most Preferable file format by LIS Professionals**

There is a wide range of file format in Information Communication Technology to store and disseminate information. This question helps to observe the preference toward file format in LIS Professionals of engineering colleges of Indore.

<table>
<thead>
<tr>
<th>S.</th>
<th>Particular</th>
<th>Respondent</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Document Files</td>
<td>41</td>
<td>68.33%</td>
</tr>
<tr>
<td>2</td>
<td>Audio/Visual File</td>
<td>02</td>
<td>3.33%</td>
</tr>
<tr>
<td>3</td>
<td>PDF Format</td>
<td>16</td>
<td>26.67%</td>
</tr>
<tr>
<td>4</td>
<td>Post Script</td>
<td>01</td>
<td>1.67%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>60</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

According to the table most of the LIS Professionals 68.33% are use to prefer as file format to document files, 26.67% of professionals are using pdf (Acrobat) files and in very
lack manner 3.33% of them are using audio visual files and 1.67% of them are using post script as a file format.

**Fig.:8**

Table: 9: **Problem in Accessing ICT by LIS Professionals**

There are various problems in connectivity of information communication technology. This question helps us to know the problems faced by LIS Professionals in using Information Communication Technology.

<table>
<thead>
<tr>
<th>S.</th>
<th>Particular</th>
<th>Responden</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Access Speed</td>
<td>22</td>
<td>36.67%</td>
</tr>
<tr>
<td>2</td>
<td>Lack of Training</td>
<td>16</td>
<td>26.67%</td>
</tr>
<tr>
<td>3</td>
<td>Overload of information on internet</td>
<td>12</td>
<td>20%</td>
</tr>
<tr>
<td>4</td>
<td>Lack of Printer</td>
<td>08</td>
<td>13.33%</td>
</tr>
<tr>
<td>5</td>
<td>Bandwidth Speed</td>
<td>02</td>
<td>3.33%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>60</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Fig.:9**

As per this table most of the LIS Professionals are use to face problems with the accessing of information communication technology. 36.67% are facing the problem of access speed, 26.67% of the professionals are not using internet for the problem of overload of information on internet, 13.33% of the professionals are not having printer and 3.33% of the LIS Professionals are facing the problem of bandwidth speed.
Table: 10:  Network facility available in the library

Internet facility is now an essential requirement of the libraries. As per engineering academic institution of Indore city it is more important for the growth of the students and research scholars.

Table:10

<table>
<thead>
<tr>
<th>S.</th>
<th>Particula</th>
<th>Respondent</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LAN</td>
<td>34</td>
<td>56.67%</td>
</tr>
<tr>
<td>2</td>
<td>MAN</td>
<td>01</td>
<td>1.67%</td>
</tr>
<tr>
<td>3</td>
<td>Intranet</td>
<td>25</td>
<td>41.67%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>60</td>
<td>100%</td>
</tr>
</tbody>
</table>

Fig.:10

Above table shows that most of the engineering colleges 56.67% of Indore city are having LAN facility. 1.67% of them having MAN facility, 41.67% of them having intranet and 0% of the engineering colleges having extranet facility in their libraries.

Table: 11:  Types of Internet Connectivity

Use of Internet improves the services of academic libraries. So the PEC libraries should be some extra facilities for internet connectivity.

Table: 11

<table>
<thead>
<tr>
<th>S.</th>
<th>Particular</th>
<th>Respond</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Leased Line</td>
<td>29</td>
<td>48.33%</td>
</tr>
<tr>
<td>2</td>
<td>Ordinary Dialup</td>
<td>10</td>
<td>16.67%</td>
</tr>
<tr>
<td>3</td>
<td>ISDN Dialup</td>
<td>10</td>
<td>16.67%</td>
</tr>
<tr>
<td>4</td>
<td>VSAT</td>
<td>01</td>
<td>1.67%</td>
</tr>
<tr>
<td>5</td>
<td>No Response</td>
<td>10</td>
<td>16.67%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>60</td>
<td>100%</td>
</tr>
</tbody>
</table>

Fig.:11
According to this table 48.33% of the engineering colleges of the Indore city having leased line connection for internet, 16.67% of them has ordinary dialup connection, 16.67% of them having ISDN dialup, 1.67% of them having VSAT connectivity, 16.67% of the LIS Professional has not given any response in this matter.

Table: 12: Most Preferable Web Browser of LIS Professionals

Internet connectivity is very much essential for the libraries in the technical colleges. This question deals with the internet browser for the network connectivity as per their preference.

Table: 12

<table>
<thead>
<tr>
<th>S.</th>
<th>Particular</th>
<th>Respondent</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Netscape</td>
<td>02</td>
<td>3.33%</td>
</tr>
<tr>
<td>2</td>
<td>Internet</td>
<td>41</td>
<td>68.33%</td>
</tr>
<tr>
<td>3</td>
<td>Mosaic</td>
<td>04</td>
<td>6.67%</td>
</tr>
<tr>
<td>4</td>
<td>Lynx</td>
<td>10</td>
<td>16.67%</td>
</tr>
<tr>
<td>5</td>
<td>Opera</td>
<td>03</td>
<td>5%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>60</td>
<td>100%</td>
</tr>
</tbody>
</table>

Fig.: 12

Above table shows that most of the engineering colleges having internet explorer as internet browser as 68.33%, 3.33% of them are having Netscape navigator as an internet browser, 6.67% of them having mosaic, 16.67% having lynx and 55 of the engineering colleges in Indore city having opera as an internet browser.
Table: 13: Use of Internet in library In-house activities and Services

Information Communication Technology has taken an important role in libraries and their activities. This question deals with the all library housekeeping activities and services of the libraries of the engineering college of Indore.

Table: 13

<table>
<thead>
<tr>
<th>S.</th>
<th>Particular</th>
<th>Respondent</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Identifying Latest</td>
<td>21</td>
<td>35%</td>
</tr>
<tr>
<td>2</td>
<td>Ordering Books</td>
<td>13</td>
<td>21.67%</td>
</tr>
<tr>
<td>3</td>
<td>Online Bookshop</td>
<td>05</td>
<td>8.33%</td>
</tr>
<tr>
<td>4</td>
<td>Subscribing E-</td>
<td>16</td>
<td>26.67%</td>
</tr>
<tr>
<td></td>
<td>Online Catalogues</td>
<td>05</td>
<td>8.33%</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>60</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Fig.:13

According to the table 35% LIS Professionals of engineering college of Indore city using internet for identifying the latest book as library housekeeping activities and services, 21.67% of them are using for the ordering process of books, 8.33% of them are using for the online bookshops, 26.67% of them are using for the subscription of e-journals and 8.33% of the professionals are using for search online catalogues from the internet.

Table: 14: Awareness about the Digital Library Software

In present time of Information Technology use of information is very increase in day by day, criteria of uses of information is very developed. Present time many Open Source Software are freely available on the internet, which are very good substitute of these types of costly Software.

Table 14

<table>
<thead>
<tr>
<th>S.</th>
<th>Particular</th>
<th>Respondent</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>KOHA</td>
<td>15</td>
<td>25%</td>
</tr>
<tr>
<td>2</td>
<td>GREENSTO</td>
<td>16</td>
<td>26.67%</td>
</tr>
<tr>
<td>3</td>
<td>DSPACE</td>
<td>11</td>
<td>18.33%</td>
</tr>
<tr>
<td>4</td>
<td>GANESHA</td>
<td>05</td>
<td>8.33%</td>
</tr>
<tr>
<td>5</td>
<td>Other</td>
<td>13</td>
<td>21.67%</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>60</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
As per table 25% of the LIS Professionals of the engineering colleges of Indore city knows the features of KOHA digital library software, 26.67% of them knows the features of Greenstone digital library software, 18.33% of them knows about DSPACE digital library software, 8.33% of them knows the features of GANESHA digital library software and 21.67% of the library & information science professionals are aware for the other digital library software also.

Table: 15: Security of Information/Data

It is the most biggest drawback of the information communication technology that the information and data should be secure otherwise it may be last forever, so every LIS Professionals and knowledge managers has to have knowledge about the security of data. This question is deals with that problem and their solution.

Table: 15

<table>
<thead>
<tr>
<th>S.</th>
<th>Particular</th>
<th>Respondent</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Anti Virus</td>
<td>12</td>
<td>20%</td>
</tr>
<tr>
<td>2</td>
<td>Password</td>
<td>14</td>
<td>23.33%</td>
</tr>
<tr>
<td>3</td>
<td>Backup</td>
<td>05</td>
<td>8.33%</td>
</tr>
<tr>
<td>4</td>
<td>Others</td>
<td>29</td>
<td>48.33%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>60</td>
<td>100%</td>
</tr>
</tbody>
</table>
Above table shows that 23.33% LIS Professionals of the engineering colleges of Indore city are use to secure their data and information, 23.33% using password protection for information, 8.33% of them use to take backup of the data and 48.33% of the LIS Professionals are using other thing for using the security of the data and information about their libraries.

**Table:16: Awareness about the E-Resources**

Electronic resources are very important medium for getting the fast information and knowledge. They are a way of preserving information contained in rare documents. They saves space and they are less expensive that other resources.

**Table 16**

<table>
<thead>
<tr>
<th>S.</th>
<th>Particular</th>
<th>Respondent</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>E-Journals</td>
<td>23</td>
<td>38.34%</td>
</tr>
<tr>
<td>2</td>
<td>E-Book</td>
<td>14</td>
<td>23.33%</td>
</tr>
<tr>
<td>3</td>
<td>E-Thesis &amp; Dissertation</td>
<td>11</td>
<td>18.33%</td>
</tr>
<tr>
<td>4</td>
<td>E-Newspaper</td>
<td>12</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>60</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Fig.:16**

According to the table 38.34% of the LIS Professionals are aware for E-journals, 23.33% of them are aware the E-books, 18.33 of them are aware for E-Thesis & Dissertation and 20% of the LIS Professionals of the engineering college of Indore city are knows about the E-Newspapers.

**Table: 17: Rating of the best library automation software Package**

Library automation plays a vital role in information communication technology in this age. Automation is not possible without the knowledge of the library automation software packages. This question is helpful for the researcher for the ranking of the automation packages.

**Table: 17**

<table>
<thead>
<tr>
<th>Libra</th>
<th>Particular</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Others</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>LYBSIS</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>SOUL</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Library Management Software</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>CDS-ISIS</td>
<td>5</td>
</tr>
</tbody>
</table>
PEC libraries LIS Professionals prefer to use other software package as the best library automation software package in on first rank after that they use to prefer LYBSIS in on second choice as the better software, than SOUL, Library management software and CDS/ISIS is less prefer by the LIS Professionals..

**Table: 18: Preference toward Internet Resources by LIS Professionals**

There are a broad collection of information are available on internet. This question helps to find the preference toward Internet Resources according to LIS Professionals of PEC Libraries.

<table>
<thead>
<tr>
<th>S.</th>
<th>Particular</th>
<th>Preference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>E-Journals</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>E-Book</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Database</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Conference</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Standards</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Thesis / Dissertations</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Technical Reports</td>
<td>7</td>
</tr>
</tbody>
</table>

According to data shown in the graph it is clear that Electronic journals are the favorite form of electronic information, E-book get second choice by the respondents, On line Data base and Conference proceedings, standard and Patent, Electronic Thesis and
Dissertations are the further in demand. Technical notes are the lowest choice of the LIS professionals.

**Findings of the study:**

1. The study every libraries of engineering college of Indore city having computer and most of them having the internet connectivity.
2. Most of the engineering college libraries are completely automated. 46.67% of the engineering colleges are completely automated.
3. LIS Professionals feels that they have sufficient internet facility in the library. 75% of the LIS professionals are fully satisfied with internet facility providing them.
4. Most of the (51.67%) LIS Professionals are using internet to update him selves with current information.
5. 36.67% of the professionals is using computer for the library housekeeping works, 26.67% are using for information services, 23.33% of them in using for e-mails and internet services.
6. Most of the LIS Professionals 68.33% are prefer a doc. Internet Explorer is the favorite web Browser as 68.33% in Engineering College of Indore.
7. Most of the LIS Professionals know about the Open Source Software packages. 25% of them know the features of KOHA digital library software, 26.67% of them know the features of Greenstone digital library software, 18.33% of them know about DSPACE digital library software.
8. Engineering Collages provide technical education so the use of technical notes should be increased in PEC libraries.
9. The speed is the main problem (36.67%) in accessing ICT facility in Libraries. Excess information on Internet is another problem (26.67%) on searching on Internet of the professionals.
10. Most of the LIS Professionals of engineering colleges of Indore city are knows about the E-journals, E-Books, E-database, conference proceedings, standard and patents and E-Thesis and Dissertation.

**CONCLUSION:-**

Information and Communication Technologies play an important role in enhancing efficiency in development of Library service. ICT is changing the work of libraries and information centers. Librarians, library patrons and supporters, and, above all, must help develop ICT-based libraries to meet the changing demands of the users. Impact of ICT on information services is characterized by changes in format, contents and methods of production and delivery of information products, emergence of Internet as largest repository of information and knowledge, changed role of LIS professional from intermediary to facilitator, new tools for dissemination of information, shift from physical to virtual service environment, and extinction of some conventional information services and emergence of new and innovative web based LIS. The study concludes that the LIS professionals who are working in engineering educational institutions in Indore in one way or the other are acquiring considerable basic skills in ICT. But they need to concentrate more on network-based services and digital library services.
Reference:-
   http://crl.du.ac.in/ical09/papers/index_files/ical-55_200_422_3_RV.pdf
   International CALIBER, pp.35-43.