EFFECTIVE USE OF INTERNET FOR KNOWLEDGE RETRIEVAL IN COLLEGE LIBRARIES

Mr. Rushmanasab Gurikar
Asst. Professor
Dept. of Library and Information Science
Guru Ghasidas University, Koni,
Bilaspur (C. G) India
Email: rrgurikar@gmail.com

Abstract

The main objective of this paper is the effective use of internet especially by the college students by using the some freely available tools over the internet. Today many people are using and browsing the internet but many of them are getting frustrated to find the right information at the right time, especially the teenagers wasting the lot of time for getting their required information over the internet. Here we made an effort to consolidate the knowledge tools which are useful especially for the college students to find out their related information by using the subject gateways, Meta search engines, bookmark etc.

Keywords: Internet Use, Knowledge Access, College libraries, College Students, Subject Gateways, Meta Search Engines, Open sources.

1. INTRODUCTION

The usage of internet is increasing day by day from the last decade. India is now world’s third largest internet user after U.S, China. India now has nearly 74 million Internet users, 31 per cent increase over March 2012\(^1\). According to the World Bank data, the considerable usage of internet growth (8.2%) find in its population in India, from 4.4% to 12.6% has increased simultaneously in 2008 to 2012\(^2\). Due to information communication technology applications, the usage of internet is growing in multi-dimensional area of subject. Literature also treasure considerable growth over the last few decades. Exponential growth in the bulk of information it is impossible for faculties, students and research scholars to be anticipated to memorize every technical journal and text book available, in fact based on current estimates the amount of information doubling every five years. This growth can be called as “big bang of information or knowledge”, this will leads to ‘information overload’, ‘information anxiety’, ‘time burden’, ‘nervousness’ to the users of internet. To overcome from these problems we need some strategy, tactics to browse the internet. Especially for the teenagers, students much required the specialized tools, websites, subject gateways, search engines to reduce their time in greater extent. So it is responsibility of the library and
information science professionals to provide the right information to the right reader at the right time.

2. USE OF INTERNET

Many people are using internet to find information, friends, charting or for their interest of area. The question is how effectively they are using internet especially concerned with new users and college students. Let us take an example, suppose a user need to login to facebook, in first step user will open a search engine like Google and then type the keyword “facebook” and click on the first link of the result page. For this we have to cross the three to four steps, instead of doing this every time we can directly use the address bar by typing the www.facebook.com or by doing bookmarking directly we can enter the home page of the any website. For the effective use of internet firstly user should develop some search strategies according to their need of the information. Then go for the search or browse of internet.

3. KNOWLEDGE RETRIEVAL

Knowledge is systematically organized fact in library, Information Centres, Archives, and over the internet world. Any sources of information or knowledge procure, organize, stored for the later retrieval. These days it is very difficult to retrieval of relevant information from the storages, due to the growth of abundant of knowledge or information over the internet. Information retrieval is concerned with all the activities related to the organization, processing and access to, information of all forms and formats. An information retrieval system allows people to communicate with information system or service in order to find information-text, graphic images, and sound recordings or video that meets their specific information needs.

4. KNOWLEDGE RETRIEVAL TOOLS

A computer system allows unlimited access to genuinely expert knowledge. The results of this experiment reveal a number of different information accessing strategies and tools linked to individual user characteristics and retrieval effectiveness.

4.1 BOOKMARKING OR FAVOURITES

A bookmark or favourites is a Uniform Resource Identifier (URI) that is stored for later retrieval in any storage formats. Almost web browsers include bookmark topographies. Bookmarks are called favourites in Internet Explorer, and by virtue of that browser's large market share, these terms have been synonymous with bookmark since the first browser war. Bookmarks are normally accessed through a menu in the user's web browser, and folders are commonly used for unification.

Bookmarks have been incorporated in browsers since the Mosaic browser in 1993. Bookmark lists were called Hotlists in Mosaic and in previous versions of Opera; with the
advent of social bookmarking, shared bookmarks have become a means for users sharing similar interests to pool web resources, or to store their bookmarks in such a way that they are not tied to one specific computer or browser. Web-based bookmarking services let users save bookmarks on a remote web server, accessible from anywhere.

Newer browsers have expanded the "bookmark" feature to include variations on the concept of saving links. Mozilla Firefox introduced live bookmarks in 2004, which resemble standard bookmarks but contain a list of links to recent articles supplied by a news site or weblog, which is regularly updated via RSS feeds. "Bookmark lets" are JavaScript programs stored as bookmarks that can be clicked to perform a function.

Use of Bookmarks or Favourites

There are over a billion web sites on the web and many of these have long and complicated URL’s. Surfers need a way to remember where their preferred web sites can be found on the web. Internet Explorer's Favourites and Netscape's equivalent Bookmarks are facilities that enable to store the URL's of web sites. It can be possible to organise favourite URL's into folders of related links - for instance we can create different folder like sports, movies, entertainment, nature, music etc. And we can store or bookmark the related links in the related folder.

To arrival to an earlier bookmarked websites is a simply go for Favourites (or Bookmarks) and by hitting the link to the site you want to see. See the below Fig-1Gogle Chrome Bookmark.

![Fig-1Gogle Chrome Bookmark Screen-Shot](image)

4.2 WIKIPEDIA: ([www.wikipedia.org](http://www.wikipedia.org))

Wikipedia is a multilingual, based on an openly editable model, web-based, free-content encyclopaedia project sponsored by the Wikimedia foundation. Wikipedia is written collaboratively by largely anonymous internet volunteers who write without pay. Anyone with internet access can write and make changes to Wikipedia articles, except in limited cases where editing is restricted to prevent disruption or vandalism. Users can contribute anonymously, under a pseudonym, or, if they choose to, with their real identity. Since its creation in 2001, Wikipedia has grown rapidly into one of the largest reference websites, attracting 470 million unique visitors monthly as of February 2012. There are more than 77,000 active contributors working on more than 22,000,000 articles in 285 languages. There are 4,388,394 articles in English. Every day, hundreds of thousands of visitors from around
the world collectively make thousands of edits and create thousands of new articles to supplement the knowledge held by the Wikipedia encyclopaedia.

4.3 OPEN SOURCES

4.3.1 DOAJ: (Directory of Open Access Journals)

The aim of the DOAJ is to increase the visibility and ease of use of open access scientific and scholarly journals, thereby promoting their increased usage and impact. The DOAJ aims to be comprehensive and cover all open access scientific and scholarly journals that use a quality control system to guarantee the content. In short, the DOAJ aims to be the one-stop shop for users of open access journals.

The content of DOAJ is available freely through http://www.doaj.org/ website without any embargo period. Almost all scholarly and scientific subjects humanity, science, social science, management, law, etc., periodical are covered that publish research review papers in full text. It will accept all academic, government, commercial, non-profit private sources. It consists of 9804 journals, 5636 Journals searchable at Article level and 1573847 Articles.

4.4 META SEARCH ENGINES

Meta search engine is a search engine which search simultaneously more than one search engine indexes to retrieve the required information for a user. Meta search engines display their results in two ways

**Single List**- Most of Meta search engines exhibit multiple-engine search outcomes in a single combined list, from which replica records have been detached.

**Multiple Lists**- Some of the Meta search engines do not organise multiple-engine search fallouts but present them instead in distinct lists as they are acknowledged from each engine. Duplicate items could perform.

**Examples of Meta search Engines**

4.4.1 DOGPILE: Web Search (http://www.dogpile.com/)

Dog pile is a Meta search engine created by infoSpace. It retrieves information best results from leading search engines like Google, Yahoo!, and Yandex. While searching we can set the preferences like relevance, recent search, search filter and advance search is possible. It is also possible to browse the information by web, video, images, news, local search and also white pages. See the below Fig-2 dogpile Mata Search Engine
4.4.2 METACRAWLER (www.metacrawler.com)

MetaCrawler is another popular Meta search engine from infoSpace and fetches results from Google, Yahoo!, and Yandex. It also facilitates the advance search and preferences such as relevance, recent search, search filter etc. It also facilitate the browsing information by web, images, news, yellow pages and white pages.

4.4.3 MAMMA (www.mamma.com)

Mama Meta search engine is primarily started in 1996 as first Meta search engine and propagated as mother of all search engines, for the reason that it gathered and organized the web's content from more than a few of the foremost search engines. This search engine provides information for browsing facility on Web results, News, Images, and Videos.

4.4.4 SEARCH.COM: Search the Web by searching the best engines from one place (http://www.search.com/)

Search.com is one of the popular engines among the Meta search engines. It is facilitate to browse the information under the categories of Web, Images, News, Shopping, Downloads, more including Games, People, Music, Video and entertainment etc. Search.com provides the other services like Top searches, free search software, advanced search, Settings, help and etc. Search.com choose the search engines to include in search Google, Blekko, DMOZ, Bing and other search engines.

4.4.5 Other Examples

Hotbot (http://www.hotbot.com/)
Deeper web (http://deeperweb.com/)

Excite (http://msxml.excite.com/)

4.5 SUBJECT GATEWAYS

Subject gateways, unlike search engines, these are created and maintained by human editors, not automatic crawlers or machines. The editors evaluate and choose top quality sites for enclose in their directories on the basis of previously resolute selection norms. The resources in the list are commonly interpreted. Subject directories are best for browsing and for searches of a more general nature. They are good sources for information on popular topics, organizations, commercial sites and products. When you would like to see what sort of information is accessible on the web in a actual area of concern, go to a gateway and browse through the subject categories.

Followings are some of the examples of subject gateways has discussed.

4.5.1 PINAKEE: A Subject Lunch pad (http://www.hw.ac.uk/libWWW/irn/pinakes/pinakes.html)

In ancient times, the Library of Alexandria was seen as a universal store of human knowledge. As the Library grew in size, however, it became increasingly difficult to locate relevant material. The poet Callimachus solved the problem by assembling a catalogue called The Pinakes. On a far smaller scale, these Web pages hope to afford a similar function for Internet assets, by linkisng to the foremost subject directories. It provides information about 36 specialized subject gateways and 09 Multi-Subject Gateways. See the below Fig-3 PINAKEE Subject Gateway Home Page

![PINAKEE Subject Gateway Home Page](image-url)
4.5.2 INTUTE (http://www.intute.ac.uk/)

Intute was launched in 2006 and developed by a number of librarians and researchers won JISC funding to develop their ideas for new Internet gateway service station under eLib Agenda. Later these subject services amalgamated together to create the Resource Discovery Network (RDN).

The Intute consortium was with seven universities including University of Birmingham, The University of Manchester, Manchester Metropolitan University, University of Nottingham University of Bristol, Heriot-Watt University and University of Oxford.

Fig-4 Intute Subject Gateway Home Page

Intute gives information about Agriculture, Architecture, Business and management, Engineering, Geography and environment, Humanities, Law, Social sciences, science and technology, Veterinary medicine etc., it categorised the sources by subject wise to sources easily. See the above Fig-4 Intute Subject Gateway Home Page

4.5.3 BRITISH LIBRARY: Explore the World’s Knowledge (http://www.bl.uk/eresources/socsci/gateways.html)

British library listed all freely available sources under electronic resources, journals and Social Science electronic resources, Gateways and Portals. Really it is consisting of many subjects’ gateways and portals which containing abundant of freely available resources on internet. For e.g. Development Gateway, Economic and Social Research Council, Law links, Parline Database, Biz/Ed, and Charity Choice etc.

4.5.4 SCIRUS: For scientific information only (www.scirus.com)

SCIRUS is the most widespread science-specific search engine on the internet. Determined by the modern search engine technology, SCIRUS hunts over 575 million science-specific web pages, scholarly, enabling Pinpoint scientific, technical and medical data on the Web.
Find the latest reports, patents, peer-reviewed articles, preprints and journals that other engines failure. It offers fashionable functionalities envisioned for experts and researchers.

SCIRUS has proved so successful at locating science-specific results on the Web that the search engine watch awards voted SCIRUS 'best specialty search engine' in 2001 and 2002 and 'best directory or search engine website' web award from web marketing association in 2004, 2005, 2006 and 2007.

4.5.5 INFOMINE  (http://infomine.ucr.edu/)

INFOMINE scholarly internet resources collection is a cybernetic library of Internet resources pertinent to faculty, research staff and students at the university level. It encompasses advantageous Internet resources such as databases, e-journals, e-books, bulletin boards, mailing lists, online library card catalogues, articles, directories of researchers, and many other types of information. INFOMINE is built from librarians of the University of California. See Fig-5 INFOMINE home page

Fig-5 INFOMINE home page

4.5.6 IPL2: Information You Can Trust (http://www.ipl.org/)

Internet Public Library2 is a community service organization and a learning/teaching environment. To date, thousands of students and volunteers of library and information science professionals have been engaged in responding reference queries for ipl2 librarian service and in designing, building, generating and upholding the ipl2's collections. It is through the efforts of these students and volunteers that the ipl2 continues to thrive to this day.
In January 2010, the website "ipl2: information you can trust" was launched, merging the collections of resources from the Internet Public Library (IPL) and the Librarians' Internet Index (LII) websites. The site is hosted by Drexel University's College of Information Science & Technology, and a consortium of colleges and universities with programs in information science are involved in developing and maintaining the ipl2.

Fig-6 IPL2 Home Page Screenshot

Internet Public Library website support for integrated search as well as provides browsing facilities. The sources are categorized into five sections i.e. Resources by subject, Newspapers and magazines, Special Collection created by ipl2, for kids and for teens. These sections will provide different information to the different users. The resources by subject contained the information like arts and humanity, business and economics, science and technology, social sciences, health and medical science, computer and internet, education, law, government and political science, entertainment and leisure etc. see Figure-6 IPL2 Home Page Screenshot.

4.5.7 DMOZ open directory project (http://www.dmoz.org/)

DMOZ Open Directory Project (ODP) is the largest, most exhaustive man-edited directory of the WWW. It is constructed and sustained by a vast, global community of volunteer editors. It is collaborative venture with AOL search, through this we can access the information on different topics given its home page (shown in the figure) and also gives integrated search and advance search as well. Instead of hostile the explosive development of the Internet, the Open Directory offers the means for the Internet to organize itself, As the Internet grows, so do the number of net-citizens. These citizens can each organize a small portion of the web and present it back to the rest of the population, discarding out the bad and useless and keeping only the best contented. See Figure-7 DMOZ Home Page Screenshot.
Fig-7 DMOZ Home Page Screenshot

4.5.8 SciCentral: Gateway to the best science news sources (http://www.scicentral.com/index.html)

Since 1997, the SciCentral editors have been accumulating breaking exploration updates from the most trustworthy and consistent sources. The service has acknowledged over 30 Web awards and enthusiastic reviews from most prominent science publishers for the quality of its service. Over 700 other websites point to SciCentral as a reliable source of information. It is ranked news sources based on Reliability, Timeliness of the information, and Extent of daily coverage, Multidisciplinary coverage and alike. It covers almost science and technology subject in its content and top news on a particular subject. Figure-8 SciCentral Home Page Screenshot
4.5.9 Agriculture and Public Health Gateway (http://aphg.jhsph.edu/)

The Agriculture & Public Health Gateway connects visitors to abundant information sources within topic areas that link these two fields. It can be a powerful tool for researchers, journalists, advocates and educators, providing access to suggested resources linked from the site. The two most important means of retrieving information through the gateway are the browse by subject collections and database search (See: Fig-9 Agriculture and Public Health Gateway Home Page Screenshot) on the topics of:

- Public Health & Agriculture
- Public Health & Agriculture
- Crop Production
- Sustainable Agriculture
- Industrial Food Animal Production
- Agriculture Policy & Public Health
- Community & Occupational Health
- Food Safety & Labeling
- Food Systems

Fig-9 Agriculture and Public Health Gateway Home Page Screenshot

Search Databases

Concurrently search these key electronic libraries such as AGRICOLA - national agricultural library collection includes more than 3.3 million bibliographic items of journal articles, theses, patents, software and technical reports associated to agriculture area from 1979 to the present. PubMed - A service of the national library of medicine that comprises more than 18 million citations for biomedical articles dating to the 1950s. Includes links to full-text articles. NASD - the National Agricultural Safety Database, EarthTrends an environmental database. Other gateway resources include links to glossaries, list serves and newsletters, online photos and images, and event listings related to agriculture and public health.
4.5.10 AgNIC: A Knowledge Discovery System for Agriculture (http://www.agnic.org/)

The Agriculture Network Information Collaborative (AgNIC) is a voluntary alliance of members based on the concept of “centres’ of excellence”. The member institutions are dedicated to enhancing collective information and services among the members and their partners for all those seeking agricultural information over the Internet.

By joining forces to enhance impact and deliver increasing access to information and expertise, it enables partner institutions to make the most of available resources and increase impact. Collectively the Alliance harnesses more than 80 information and subject specialists, over 60 topics covered comprehensively, full-text and web-based resources, participation from five countries with collaborative contributions from many more.

AgNIC facilitates and participates in partnerships and cooperation among institutions and organizations world-wide that are committed to the identification, delivery and preservation of reliable, freely-available, evaluated, digital content and quality services for agriculture, food, and natural resources information.

Through AgNIC we can search the world latest agricultural news, Upcoming Events, Events Calendar it includes Agriculture related conferences, meetings and other events. For example see below fig.

2. Fertilizer Value Chain-Supply System Management and Servicing Farmers' Needs

Dates: Dec 02 - 06, 2013

Organizer: International Fertilizer Development Center

Country: Malaysia

City: Kuala Lumpur

Add to calendar:


4.5.11 Food and Agriculture Organization of the UNO (http://www.fao.org/home/en/)

FAO acts as a neutral forum where all nations meet as equals to negotiate agreements and debate policy. FAO is also a source of knowledge and information, and helps developing countries and countries in transition modernize and improve agriculture, forestry and fisheries practices, ensuring good nutrition and food security for all. The FAO Statistical...
Division produces FAOSTAT, which offers free and easy access to data for 245 countries and 35 regional areas from 1961 through the most recent year available. Enhanced features include browsing and analysis of data, an advanced interactive data download, and enhanced data exchange through web services.

Fig-10 Food and Agriculture Organization of UNO Home Page Screenshot

4.5.12 INFOLAW: Discover the Legal Web (http://www.infolaw.co.uk/)

INFOLAW discover the legal web was established in 1991. Since inception it is focussed in the provision of forms and patterns and law publishing service area. It has been vigorous on the web since early 1995 and has widened the variety of services to cover all web-based publishing movement. It is very useful source for law businesses, company legal departments, lawyers, academics, students and a number of law publishers etc. See Fig-11 INFOLAW Home Page Screenshot.

Fig-11 INFOLAW Home Page Screenshot
4.5.13 LIBRARY GATEWAYS

Library gateways are assemblages of databases and informational websites, organized by subject that have been collected, reviewed and recommended by specialists, usually librarians. These gateway assemblies support research and reference needs by recognizing and directing to high excellence pages on the web.

Examples of Library Gateways

- Academic Information (www.academicinfo.net)
- Argus Clearinghouse (http://clearinghouse.net)
- Digital Librarian (www.digital-librarian.com)
- Librarian’s Index to the Internet (http://lii.org)

4.6 SPECIALIZED DATABASES

Specialized databases are databases created by university teachers, researchers, experts, administrative agencies, business interests, and subject authorities and/or individuals who have a deep interest in, and skilled knowledge of, a particular field and have mount up information and data about it.

For e.g: First Search, ProQuest, EBISCO, JOSTOR etc.

4.7 THE INVISIBLE WEB

There is a large percentage of the web information that search engine spiders may not catalogue or index. It has so-called the "Invisible Web" and includes, among other things, password secured websites, documents behind firewalls, PDF files, archived material, collaborative tools such as calculators and dictionaries, and the contents of database. Web profilers decide that the Invisible Web, which is made up of hundreds of thousands of such documents and databases, accounts for 60 to 80 per cent of existing web material. This is information probably assumed you could access by using standard search engines, but that's not at all times of the circumstance. According to www.invisibleweb.com, these resources are not usually visible to search engine spiders because they are embedded within individual web sites. Library gateways and specialty search tools are worthy sources for straight links to database information warehoused on the invisible sites.

CONCLUSION

The Internet has what it takes to transforms education at all levels. What is needed is the provision of right infrastructure to serve as the vehicle for the Internet to the colleges. Internet facilities on the many college campuses are characterized by poor or slow internet speed. This situation has the potency to limit effective use of the Internet technology for the knowledge access. As a result majority of students in the colleges are not fully harnessing the
opportunities offered by the internet facilities on their various college campuses. The educational institutions should continually review their training programmes in computer and internet user skills. This will ensure that users are updated with new techniques and opportunities that characterize the ICT world. Libraries and Computer laboratory managers must introduce time regulatory policies to restrict usage periods by students. This will ensure that more students have access to Internet services. Finally the professionals should ensure that the effective use of knowledge access tools as above discussed and moreover the professionals always update with such a knowledge access tools for use of the students.

References

USE OF ELECTRONIC RESOURCES IN SELECT ENGINEERING COLLEGE LIBRARIES OF CHITTOOR DISTRICT

H. Fakrudhin Ali Ahamed
Librarian
Sri Venkateswara College of Engineering and Technology, Chittoor,
e-mail: faa ctr@gmail.com,
Phone: +91-9441304320

V. Syamala
Librarian, P.C.R. Govt.Jr.College, Chittoor,
e-mail: syamalavemula@yahoo.co.in
Phone: +91-9985916948

Abstract

Analysis of data collected from a simple random sample of 150 users of libraries of Sri Vidyaniketan and Sreenivasa institute with regard to their use of Electronic Resources using questionnaire method, reveals that most of students (54.89%) use online journals. Most of the users (61.73%) replied that they have access the online journals from the library. (60.49%) find the online journals are useful for their course work. Less than half of the students (43.21%) are using online journals, (22.83%) of them are highly satisfied, (16.05%) of them are neither satisfied nor dissatisfied and (17.91%) of them are dissatisfied. ‘No proper guidance for using online journals’, ‘Internet access is very low’, ‘insufficient numbers of computers’ are the major problems faced by the users in the use of online journals. A number of suggestions have been made to increase the usage of e-resources in the libraries of Sri Vidyaniketan and Sreenivasa Institute.

KEYWORDS: e-resources, Digital Libraries, Engineering College Libraries.

1. INTRODUCTION

Over the past few years, a numbers of techniques and related standards have been developed which allow documents to be created and distributed in electric form. Hence to cope with the present situation, libraries are shifting towards new media, namely electronic resources for their collection developments that the demands of users are better fulfilled. The e-resources on magnetic and optical media have a vast impact on the collections of university libraries. These are more useful due to inherent capabilities for manipulation and searching,
providing information access is cheaper to acquiring information resources, savings in storage and maintenance etc. and sometimes the electronic form is the only alternative. The proliferation of electronic resources has had a significant impact on the way the academic community uses, stores, and preserves information. To meet the ever-increasing demands from users for remote access to information, academic libraries now subscribe to electronic resources such as e-books, full-text e-journals and online bibliographic databases, in addition to housing these resources in their printed formats.

WHAT IS AN E-RESOURCES?

An electronic resource is defined as a resource which requires computer access or any electronic product that delivers a collection of data, be it text referring to full text bases, electronic journals, image collections, other multimedia products and numerical, graphical or time based, has been as a commercially available title that published with an aim to being marketed. These may be delivered on CD ROM, on tape, via internet and so on.

2. REVIEW OF LITERATURE

S.M. Zabed Ahmed (2013)¹. The main purpose of this paper is to describe the results of a survey conducted in two specialized public universities in Bangladesh to assess students' electronic information resources use and their satisfaction with university subscribed resources. A structured questionnaire was used to assess the use of and satisfaction with university subscribed electronic resources by the students. The major problems faced by them in accessing online resources were also identified. The survey results showed that the students are not at all satisfied with the current level of university subscribed online resources. The students identified limited access to computers and slow download speed as major problems.

Muhammad Sajid Mirza(2012)². This study is an attempt to evaluate the effectiveness of electronic resources and services in Pakistani university libraries on the basis of users' satisfaction. A survey method was employed to conduct the research. Using convenience sampling, eight university libraries; four each from Islamabad and Lahore including two from the public sector and two from the private sector having IT applications, were included in the users survey. The total population (i.e., 40,236) of library users was very large; therefore, a reasonable, manageable and convenient sample of 800 library users, including 100 users each from the eight libraries was selected. A semi structured questionnaire was designed to collect data, while a five-point Likert Scale from 1 (Dissatisfied) to 5 (Extremely satisfied) was used to measure the satisfaction level of the respondent. The study concluded that Pakistani university libraries are offering effective electronic resources and services to their users. Liyi Zhang(2011)³. The purpose of this paper is to report on users' information behaviour in China, a topic which has not been researched extensively. The aim is to help producers and providers collect and develop more electronic resources. The study investigates users' information behaviour at seven “211 Project” universities in Wuhan, a city in central China. These universities all have access to the resources of the National Science
Chetan Sharma(2011). This paper seeks to emphasise the use of e-resources by teachers and research scholars in the National Dairy Research Institute (NDRI) and the National Bureau of Animal Genetic Resources (NBAGR). The paper aims at particularly identifying the needs of the users as well as the problems faced by them while using e-resources and also their level of satisfaction in getting the essential information on electronic means. A survey was conducted through a questionnaire circulated among 140 teachers and research scholars of NDRI and NBAGR. The response rate was an encouraging 90.71 per cent. The majorities of the respondents are well aware of the various e-resources in their respective field and confidently use them regularly. E-Journals are the most preferred e-resource among the respondents. They seek the help of e-resources to perform their routine exercises, i.e. teaching, research, entertainment and communication. Some major problems faced by the respondents are slow speed of internet, difficulty in retrieving contents and poorly designed web sites. Ming-der Wu(2010). This study aims to answer the following questions about humanities graduate students: what are the characteristics of the documents cited in their theses? Where and how do they obtain those citations? Do students use and cite electronic resources? Do students favour electronic resources over paper versions? The study's participants were 20 humanities graduate students. Following an analysis of the citations in their theses, list-checking and follow-up interviews were conducted. The results showed that these humanities graduate students cited considerably more print materials than electronic resources. Most of the documents cited were supplied by the university library. Only a small proportion of the documents were available in electronic format either from the university library or from the internet. The availability ratio of journals was higher than that of books. Students' acceptance of e-journals was higher than that of e-books.

3. OBJECTIVES OF THE STUDY

The digital libraries as they are conceived today have been developed only since 1990’s. The term “Electronic Information Resources” is used in a wider perspective to include all sources where the information is available in electronic formats and accessible with a help of computer. These sources include Automated Library, Electronic Library, Virtual Library, Paperless Multimedia Library and all of them are used interchangeably and synonymously. It is quite necessary to conduct a survey relating to the use of Electronic resources and services and to assess the impact of E-sources on teaching/learning process.
Such information if available can be effectively used in planning and providing the Library services to satisfy the needs of its users. Therefore, it is proposed to carry out a detailed study of the facilities available in the library and the use of electronic sources in engineering college libraries of Chittoor District.

**FOLLOWING ARE THE SPECIFIC OBJECTIVES OF THE STUDY**

- To know the location of accessing e-journals
- To know the usefulness of online journals
- To know the platform used for accessing online journals
- To know the frequency of downloading the online journals
- To know the frequency of referring back volume of online journals
- To know the use of online journals over printed journals
- To know the purpose of using online journals
- To now the levels of satisfaction of using online journals.

**3.1 LIMITATIONS OF THE STUDY**

The present study is limited to only two Engineering Colleges of Chittoor District that is SHREE VIDHYANIKETHAN COLLEGE OF ENGINEERING AND SRINIVAS INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES. Moreover, the B.Tech 3rd year and the 4th year students are considered for collecting the information for the study. The analysis is carried out based on the response provided by those students only.

**4. METHODOLOGY**

Survey method of research has been adopted in the present study.

**4.1 SELECTION OF SAMPLE AND PERIOD**

Sree Vidyanikethan College of Engineering and Srinivasa Institute of Technology and Management Studies are hereafter shortly referred as Sree Vidyanikethan College and Srinivasa Institute respectively. A sample of 100 students in Sree Vidyanikethan College and 100 of Srinivasa Institute were selected by using simple random sampling method. The questionnaire has been handed over personally to all the above 200 students. Enough time was given to them to complete the questionnaire and to return the same. Sixty five students of Sree Vidyanikethan College and 85 students of Srinivasa Institute responded by returning the complete questionnaire after fifteen days. That is 65% of Sree Vidyanikethan College and 85% of Srinivasa Institute responded to the present survey. Therefore, the present sample size is 150.
4.2 COLLECTION OF DATA

For collecting data Questionnaire method was used to collect the information from 3rd and 4th year B.Tech. students. The Open-ended questions are so designed, that the respondents can provide their feedback freely, regarding the electronic resources and general facilities of the college libraries. The questionnaire includes the name of the respondent. The respondent was not insisted this in case he/she does not like to reveal his/her identity. This encourages the respondents to provide frank opinions.

4.3 ANALYSIS AND PRESENTATION OF DATA

The data for all the questions is analyzed. The data for some of the questions is presented in tabular form, where as for other questions, the data is presented through bar charts. Chi-square test is also used for drawing conclusions.

5 ANALYSIS AND DISCUSSION

The questionnaire, which is circulated to the III and IV year B.Tech. Students of Sree Vidyanikethan College of Engineering and Technology (Sree Vidyanikethan College) and Srinivasa Institute of Technology and Management Studies (Srinivasa Institute). One hundred and fifty candidates returned the completed questionnaire. The sample covers 65 B.Tech. Students of Sree Vidyanikethan College and 85 B.Tech. Students of Srinivasa Institute.

5.1 ONLINE JOURNALS

The students were asked to reveal whether they are using online journals or not. The replies given by them are shown in Table 1.

<table>
<thead>
<tr>
<th>Opinion</th>
<th>SREE VIDYANIKETHAN</th>
<th>SRINIVASA INSTITUTE</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>III</td>
<td>IV</td>
<td>No.</td>
</tr>
<tr>
<td>Yes</td>
<td>9</td>
<td>31</td>
<td>40</td>
</tr>
<tr>
<td>No</td>
<td>13</td>
<td>12</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>43</td>
<td>65</td>
</tr>
<tr>
<td>Chi-Square Value</td>
<td><strong>7.34</strong></td>
<td>0.79</td>
<td>2.73</td>
</tr>
</tbody>
</table>
It can be observed from Table 1 that most of students (54.89%) use the online journals and 45.11% of them do not use. It is also evident from the $\chi^2$ value that there is no significant difference between B.Tech. students of Sree Vidyanikethan College and Srinivasa Institute in this regard.

### 5.2 LOCATION OF ACCESS TO ONLINE JOURNALS

The details of the place from where the students refer the Online Journals is presented in Table 2.

<table>
<thead>
<tr>
<th>Location</th>
<th>SREE VIDYANIKETHAN</th>
<th>SRINIVASA INSTITUTE</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>III</td>
<td>IV</td>
<td>No.</td>
</tr>
<tr>
<td>Library</td>
<td>7</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>Department</td>
<td>2</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Home/Hostel</td>
<td>3</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Other places</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>28</td>
<td>40</td>
</tr>
</tbody>
</table>

**Chi-square Value**

- **SREE VIDYANIKETHAN**: 2.4
- **SRINIVASA INSTITUTE**: 0.56
- **Grand Total**: 6.05

Df=(R-1) (C-1)  
\[ (2-1) (4-1) \]

1 * 3 = 3 Not Significant

It can be observed from Table 2 that most of the students (61.73 %) access the online journals from the library, (27.16%) of them access from the department, and only (11.11%) of them access from home/hostel. It is also evident from the $\chi^2$ value that there is no
significant difference between B.Tech. students of Sree Vidyanikethan College and Srinivasa Institute in this regard.

5.3 USEFULNESS OF ONLINE JOURNALS

The students, who use the online journals, were again asked to reveal the level of usefulness of online journals. Their replies were shown in Table 3.

Table 3: Usefulness of Online Journals

<table>
<thead>
<tr>
<th>Extent of usefulness</th>
<th>SREE VIDYANIKETHAN</th>
<th>SRINIVASA INSTITUTE</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>III</td>
<td>IV</td>
<td>No.</td>
</tr>
<tr>
<td>Very useful</td>
<td>2</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Useful</td>
<td>8</td>
<td>20</td>
<td>28</td>
</tr>
<tr>
<td>Occasionally Useful</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Useless</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>29</td>
<td>40</td>
</tr>
<tr>
<td>Chi-square Value</td>
<td>0.64</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Df=(R-1) (C-1)

(2-1) (4-1)

1 * 3 = 3 Not Significant

It can be observed from Table 3 most of the students (60.49%) find the online journals are useful for their course work. It is also evident from the $\chi^2$ value that there is no significant difference between B.Tech. students of Sree Vidyanikethan College and Srinivasa Institute in this regard.

5.4 PLATFORMS USED FOR BROWSING ONLINE JOURNALS

The students, who use the online journals, were again asked to reveal the platforms used for browsing online journals. Their replies were shown in Table 4.
Table 4: Platforms used to locate the Online Journals

<table>
<thead>
<tr>
<th>Platform</th>
<th>SREE VIDYANIKETHAN</th>
<th>SRINIVASA INSTITUTE</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>III</td>
<td>IV</td>
<td>No.</td>
</tr>
<tr>
<td>Science Direct</td>
<td>3</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>IEEE &amp; IEE</td>
<td>8</td>
<td>21</td>
<td>29</td>
</tr>
<tr>
<td>S Citation</td>
<td>-</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Never</td>
<td>3</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>37</td>
<td>51</td>
</tr>
<tr>
<td>Chi-square Value</td>
<td>0.690</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Df=(R-1) (C-1)

(2-1) (4-1)

1 * 3 = 3 Not Significant

It can be observed from Table 4 that most of the students (56.86%) use IEEE and IEE platform to locate the online journals, (17.21%) of them use Science Direct platform and (11.28%) of them use S Citation platform to locate the Online Journals. It can be stated that IEEE and IEE platform is quite often used by Sree Vidyanikethan College and Srinivasa Institute students for browsing online journals. It is also evident from the \( \chi^2 \) value that there is no significant difference between B.Tech. students of Sree Vidyanikethan College and Srinivasa Institute in this regard.

5.5 DOWNLOADING OF ARTICLES FROM ONLINE JOURNALS

The students were asked to reveal whether they download the articles from online journals or not. The replies given by them are shown in Table 5.
It can be observed from Table 5 that most of students (57.34%) replied that they did not download articles from online journals. The remaining (42.66%) of them responded positively. It is also evident from the $\chi^2$ value that there is no significant difference between B.Tech. students of Sree Vidyanikethan College and Srinivasa Institute in this regard.

5.6 FREQUENCY OF DOWNLOADING ARTICLES

The respondents, who downloaded the articles from online journals, were again asked to reveal the frequency of downloading articles from online journals. Their replies were shown in Table 6 and in Figure 1.
Df=(R-1) (C-1)
  (2-1) (4-1)
  1 * 3 = 3 Not Significant

It can be observed from Table 6 and Figure 1 that 40.62% of students download the
articles sometimes from the online journals, (34.38%) of them download the articles
frequently and (25%) of them occasionally download the articles. It is also evident from the
value that there is no significant difference between B.Tech. students of Sree
Vidyanikethan College and Srinivasa Institute in this regard.

Figure 1: Frequency of downloading articles

5.7  REFERRING PRINTED VERSION OF CURRENT JOURNALS

The students were asked to mention whether they refer printed version of current
journals. The replies given by them are shown in Table 7.

Table 7: Referring printed version of current journals

<table>
<thead>
<tr>
<th>Opinion</th>
<th>SREE VIDYANIKETHAN</th>
<th>SRINIVASA INSTITUTE</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>III</td>
<td>IV</td>
<td>No.</td>
</tr>
<tr>
<td>Yes</td>
<td>6</td>
<td>23</td>
<td>29</td>
</tr>
<tr>
<td>No</td>
<td>16</td>
<td>20</td>
<td>36</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>43</td>
<td>65</td>
</tr>
<tr>
<td>Chi-Square Value</td>
<td>3.05</td>
<td>0.744</td>
<td>0.978</td>
</tr>
</tbody>
</table>
Df= (R-1) (C-1)

(2-1) (2-1)

1 * 1 = 1  Not Significant

It can be observed from Table 7 that most of students (60.05%) never refer printed version of current journals. The remaining (39.95%) of them replied positively. It is also evident from the χ² value that there is no significant difference between B.Tech. students of Sree Vidyanikethan College and Srinivasa Institute in this regard.

5.8 FREQUENCY OF REFERRING BACK VOLUMES OF ONLINE JOURNALS

The respondents, who refer back volumes of online journals, were again asked to reveal the frequency of referring back volumes of online journals. Their replies were shown in Table 8 and in Figure 2.

Table 8: Frequency of referring back volumes of online journals

<table>
<thead>
<tr>
<th>Frequency of use</th>
<th>SREE VIDYANIKETHAN</th>
<th>SRINIVASA INSTITUTE</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>III</td>
<td>IV</td>
<td>No.</td>
</tr>
<tr>
<td>Frequently</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Occasionally</td>
<td>4</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Sometimes</td>
<td>4</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>Never</td>
<td>4</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
<td>31</td>
<td>44</td>
</tr>
<tr>
<td>Chi-square Value</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Df=(R-1) (C-1)

(2-1) (4-1)

1 * 3 = 3 Not Significant
It can be observed from Table 8 and Figure 2 that (39.42%) of students refer the back volumes of online journals sometimes, (27.89%) of them refer occasionally, and (12.5%) of them refer frequently. The remaining (20.19%) of students never refer the back volumes of online journals. It is also evident from the $\chi^2$ value that there is no significant difference B.Tech. students of Sree Vidyanikethan College and Srinivasa Institute in this regard.

Figure 2: Frequency of referring back volumes of online journals

5.9 REFERRING OF PRINTED BACK VOLUMES OF JOURNALS

The students were asked to mention whether they refer printed back volumes of journals. The replies given by them are shown in Table 9.

Table 9: Referring printed back volumes of journals

<table>
<thead>
<tr>
<th>Opinion</th>
<th>SREE VIDYANIKETHAN</th>
<th>SRINIVASA INSTITUTE</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>III</td>
<td>IV</td>
<td>No.</td>
</tr>
<tr>
<td>Yes</td>
<td>10</td>
<td>19</td>
<td>29</td>
</tr>
<tr>
<td>No</td>
<td>12</td>
<td>24</td>
<td>36</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>43</td>
<td>65</td>
</tr>
<tr>
<td>Chi-Square value</td>
<td>0.276</td>
<td>1.244</td>
<td>0.122</td>
</tr>
</tbody>
</table>
Df=(R-1) (C-1)

(2-1) (2-1)

1 * 1 = 1  Not Significant

It can be observed from Table 9 that most of students (56.51%) never refer printed back volumes of online journals. The remaining 43.49% of them replied positively in this regard. It is also evident from the $\chi^2$ value that there is no significant difference between B.Tech. students of Sree Vidyanikethan College and Srinivasa Institute in this regard.

**5.10 USE OF ONLINE JOURNALS OVER PRINTED JOURNALS**

The students were asked to mention whether they prefer to use online journals over printed journals. The replies given by them are shown in Table 10 and in Figure 3.

<table>
<thead>
<tr>
<th>Opinion</th>
<th>SREE VIDYANIKETHAN</th>
<th>SRINIVASA INSTITUTE</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>III</td>
<td>IV</td>
<td>No.</td>
</tr>
<tr>
<td>Yes</td>
<td>7</td>
<td>20</td>
<td>27</td>
</tr>
<tr>
<td>No</td>
<td>15</td>
<td>23</td>
<td>38</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>43</td>
<td>65</td>
</tr>
</tbody>
</table>

Chi-Square value

Df=(R-1) (C-1)

(2-1) (2-1)

1 * 1 = 1  Not Significant

It can be observed from Table 10 and Figure 3 that most of students (55.33%) do not prefer to use online journals over printed journals. The remaining 44.67% of them replied positively in this regard. It is also evident from the $\chi^2$ value that there is no significant difference between B.Tech. students of Sree Vidyanikethan College and Srinivasa Institute in this regard.
5.11 PURPOSE OF USING ONLINE JOURNALS

The purpose of using online journals by the Sree Vidyanikethan College and Srinivasa Institute students is presented in Table 11.

Table 11: Purpose of using Online Journals

<table>
<thead>
<tr>
<th>Purpose</th>
<th>SREE VIDYANIKETHAN</th>
<th>SRRINIVASA INSTITUTE</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>III</td>
<td>IV</td>
<td>No.</td>
</tr>
<tr>
<td>Project work</td>
<td>5</td>
<td>14</td>
<td>19</td>
</tr>
<tr>
<td>Reference</td>
<td>5</td>
<td>11</td>
<td>16</td>
</tr>
<tr>
<td>Writing Articles</td>
<td>2</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>To keep abreast</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>32</td>
<td>48</td>
</tr>
<tr>
<td>Chi-square Value</td>
<td>1.413</td>
<td>0.911</td>
<td>3.496</td>
</tr>
</tbody>
</table>

\[ \text{Df} = (R-1) (C-1) \\
(2-1) (4-1) \\
1 \times 3 = 3 \text{ Not Significant} \]
It can be inferred from Table 11 that (40.86%) of students are using online journals for reference purpose, (34.30%) of them are using for preparing project work, (13.51%) of them are using to keep abreast in the field and (11.33%) of them are using for writing articles. It is also evident from the $\chi^2$ value that there is no significant difference between B.Tech. students of Sree Vidyanikethan College and Srinivasa Institute in this regard.

5.12 LEVEL OF SATISFACTION OF USING ONLINE JOURNALS

The degree of satisfaction in using the online journals in the library is presented in Table 12.

Table 12: Level of Satisfaction in using online journals in the library

<table>
<thead>
<tr>
<th>Level of Satisfaction</th>
<th>SREE VIDYANIKETHAN</th>
<th>SRINIVASA INSTITUTE</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>III</td>
<td>IV</td>
<td>No.</td>
</tr>
<tr>
<td>Highly Satisfied</td>
<td>-</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Satisfied</td>
<td>10</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Neither satisfied nor dissatisfied</td>
<td>3</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Dissatisfied</td>
<td>4</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>37</td>
<td>54</td>
</tr>
<tr>
<td>Chi-square Value</td>
<td>0.268</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$Df=(R-1)(C-1)$

(2-1) (4-1)

1 * 3 = 3 Not Significant

** Significant level at 0.01.

It can be observed from Table 12 that (43.21%) of students are satisfied in using online journals in the library, (22.83%) of them are highly satisfied, (16.05%) of them are neither satisfied nor dissatisfied and (17.91%) of them are dissatisfied. It is also evident from the $\chi^2$ value that there is significant difference between B.Tech. students of Sree Vidyanikethan College and Srinivasa Institute in this regard.

5.13 SATISFACTION WITH PRESENT WORKING HOURS OF LIBRARY

The students were asked to mention whether they are satisfied with the present working hours of library. The replies were given by them are shown in Table 13.
Table 13: Satisfaction with Present Working Hours of Library

<table>
<thead>
<tr>
<th>Level of satisfaction</th>
<th>SREE VIDYANIKETHAN</th>
<th>SRINIVASA INSTITUTE</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>III IV No. %</td>
<td>III IV No. %</td>
<td>No. %</td>
</tr>
<tr>
<td>Highly satisfied</td>
<td>10 11 19.29</td>
<td>10 4 14 17.94</td>
<td>25 18.61</td>
</tr>
<tr>
<td>Satisfied</td>
<td>13 25 66.67</td>
<td>24 18 42 53.85</td>
<td>80 60.26</td>
</tr>
<tr>
<td>Neither satisfied nor dissatisfied</td>
<td>3 2 5 8.78</td>
<td>6 4 10 12.83</td>
<td>15 10.81</td>
</tr>
<tr>
<td>Dissatisfied</td>
<td>1 2 3 5.26</td>
<td>5 7 12 15.38</td>
<td>15 10.32</td>
</tr>
<tr>
<td>Total</td>
<td>18 39 57 100</td>
<td>45 33 78 100</td>
<td>135 100</td>
</tr>
<tr>
<td>Chi-square value</td>
<td>0.638</td>
<td>1.620</td>
<td>3.921</td>
</tr>
</tbody>
</table>

\[ \text{Df} = (R-1) (C-1) \]
\[ (2-1) (4-1) \]
\[ 1 * 3 = 3 \text{ Not Significant} \]

It can be inferred from Table 5.49 that most of students (60.26%) are satisfied with the present working hours of their library, 18.61% of them are highly satisfied, 10.81% of them are neither satisfied nor dissatisfied and 10.32% of them are dissatisfied with the present working hours of their library. It is also evident from the \( \chi^2 \) value that there is no significant difference between B.Tech. students of Sree Vidyanikethan College and Srinivasa Institute in this regard.

**GENERAL AND OPEN ENDED QUESTIONS**

The questionnaire contained open ended questions to receive some feedback regarding Electronic resources from the B.Tech., students of Sree Vidyanikethan College and Srinivasa Institute. The most widely quoted difficulties faced by the students (based on their response) in using the e-resources are:

1. There is no proper guidance for using digital resources, and lack of awareness of using digital resources. Librarian is never co-operative to the students.
2. Most of the time the digital library section does not work.
3. Though the digital library is available in the college, the staff will not allow students and is always found closed.
4. Imposing of some rules and regulations for accessing the digital resources is essential.
5. The library management is not taking steps in making digital library facilities to put into maximum use.
6. Students unable to use the computer since the user name and password, which are essential to use them, are not informed to them.
7. Internet access is very slow and not satisfactory. Library needs some more computers for the purpose of internet, because the usage of internet is always busy.
8. Students need CD-WRITERS at Digital Library. CD Writers are not working properly.
9. The digital resources are old and outdated. They need new technologies for search.
10. There is only one printer and one scanner available, which are inadequate.

6. FINDINGS AND RECOMMENDATIONS

6.1 FINDINGS

- In B.Tech. course all the students are expected to use the Electronic resources and journals to carry their degree programme. Sree Vidyanikethan College has provided 32 computers, 2 scanners and 2 printers for the digital library. Sreenivasa Institute has provided 20 computers and 1 printer for the digital library. Both colleges are members of DELNET.
- Most of the students of Sree Vidyanikethan College (61.54%) use online journals and (48.28%) of students of the Srinivasa Institute use online journals. It has been found that majority of students in both colleges access the online journals from their college library. Most of the students in both colleges found that online journals are useful for their course work. Nearly half the students use IEEE and IEE platform for accessing online journals.
- It is found that most of the students (57.34%) in both colleges do not download the articles from online journals. Most of the students (60.05%) in both colleges never refer printed version of current journals. It is also evident from the study that (56.51%) of the students never refer the printed back volumes of journals. The study reveals that (55.33%) of the students did not prefer to use online journals to printed journals.
- More than (40.86%) of B.Tech., students use the online journals for collecting the references for their course work. On the other hand (34.30%) of them use the online journals for preparing the project reports. The study shows that (43.21%) of the students are satisfied in using online journals in the library.
- It is evident from the study that (53.09%) of the students are satisfied with the photocopying facility available in their library. Most of the students (60.26%) are satisfied with the present working hours of their libraries. Most of the students (56.80%) are satisfied with the physical facilities of their libraries.

6.2 RECOMMENDATIONS

After the analysis of data the following recommendations are made by the investigator
To enhance the use of Electronic and Digital Resources of their college Library, the Institute should conduct awareness or Orientation programmes (once in a semester) to its B.Tech., students and train them in the use of these resources.

All the computers located in the digital section should be provided with CD-Writers and USB Port for copying the downloaded articles for themselves.

The Institute should provide sufficient systems for Internet purpose and increase the speed of access.

The students should be allowed to use electronic and digital resources without imposing any rules and regulations, at least during the working hours of Library.

The working hours of the digital library should be extended.

The digital resources should be updated.

Surveys on the use of electronic resources in the engineering college libraries in various districts of Andhra Pradesh are to be conducted to generalize the findings of the present study.

REFERENCE

NETWORKING OF MEDICAL LIBRARIES IN ANDHRA PRADESH: A PROPOSAL

Dr. P. Srinivasulu
Librarian and Head, Dept. of Library and Information Centre, CMR Institute of Technology
Kandlakoya Village, Medchal Road, Hyderabad 501 401, A.P., India.
E-Mail: srinivasp09@yahoo.com, drsrinivas01@gmail.com
And

Dr. V. Pulla Reddy
Former Professor, Head & Chairman, BOS.,
Dept. of Library and Information Science, Sri Venkateswara University,
Tirupati - 517 502, A.P., India.
E-Mail: pullareddyv@gmail.com

Abstract

The proposal interprets the importance of library network and the concept of medical library networking to facilitate information resource sharing and support activities in libraries has become a quintessential in Andhra Pradesh, India. This paper deals with an idea to motivate for networking and resource sharing in NTR University of Health Sciences, Vijayawada, Andhra Pradesh affiliated to medical college libraries. The present study briefly highlights some of the objectives, functioning, essentials, benefits, drawbacks, services, future prospects and implementation phases of completeness of proposal networking formation as crucial for “APMEDLIBNET”. It also emphasizes the importance of information available be shared among the members libraries to make easy the user commodity. A networking concept of libraries in the state of Andhra Pradesh “APMEDLIBNET” is anticipated and discussed in this proposal for resource sharing.

Keywords: Network, Medical Library Networking, NTR University of Health Sciences, Andhra Pradesh, Hardware and Software and APMEDLIBNET.

1. Introduction

A network implies communication links that permit computers to communicate with each other and to share programmes, facilities, data and knowledge base. A network can be local, regional, national or international. It is for the electronic transfer of information between two or more points irrespective of distance. Networks have been developed to link industrial firms, banks, educational institutions, social welfare units, libraries and information centres, and so on. These networks provide resources and information to their users in larger volumes at greater speed than the other methods of resources sharing.
Stevens\textsuperscript{1} defined network “as a formal organization of three or more autonomous organizations interconnected to achieve their common purpose through the joint use of communication and computer technology”.

2. **Library network**

Owing to knowledge explosion and the consequent flood of information, no library today, however big, can dream of becoming self-sufficient. Information is being produced at such a great speed and in such bulk that even the biggest libraries are not in a position to procure all of them. The goal of self-sufficiency has, therefore, become unrealistic and impracticable. It is for this reason that someone has wisely suggested that the slogan, “No library can stand alone” should be adopted as the ‘sixth law’ of library science. Therefore, cooperation and sharing of resources among libraries is very essential for delivering effective library services.

The network should have:

- A telecommunication network; and
- As many databases as possible preserved on optical media.

Library resources are shared through automation and networking with the use of telecommunication technology\textsuperscript{2}.

The UNISIST defined information network as “a set of interrelated information systems associated with communication facilities which are cooperating through more or less formal agreements, in order to jointly implement information handling operation, with a view to pooling their sources and better services to the users. Basically information network is a mixture of computer and communication technology where distributed processing on intelligent machines in different locations is cooperated by means of networks\textsuperscript{3}. In the words of Neelamegan\textsuperscript{4}, information network is “an arrangement to link information resources and information seekers/users such that the latter can obtain the information they need or seek from the information resources. The basic objective is the sharing of digital networks, web publishing and provision of other information services by and among the participating entities at an affordable cost”.

3. **Drawbacks of the medical college libraries in Andhra Pradesh**

The following are some of the drawbacks in the existing medical college libraries in Andhra Pradesh, which were expressed by the medical students and librarians.

1. Twenty seven point seventy six per cent of medical students are neither satisfied nor dissatisfied and 15.97\% of them are dissatisfied with overall service and facilities of medical college libraries.
2. Most of the medical students (80.61%) are unaware of open access electronic journals.
3. The majority of the libraries (72.73%) did not subscribe to Indian and foreign periodicals as per the norms of Medical Council of India.
4. Most of the libraries (81.82%) have not been automated.
5. A considerable percentage of librarians (36.36%) do not get training in application of computers in libraries.

Hence there is need for automation and networking of medical college libraries to share the resources among themselves.

Today academic libraries including medical libraries may not be able to provide all the information services to the users from their own collection. Library networking is meant for promoting and facilitating sharing of resources available within a group of libraries with the purpose of providing information services optimally to all the potential users and also to make use of national and international resources.

The concept of networking implies a higher degree of functional interdependency, resources pooling, responsibility of sharing, and commonality of systems, standards and goals. A network developed with the help of computer, communication and networking technologies ensures availability of, and accessibility to, a vast variety of information that is needed for scientific decision making, research and development in all walks of life. This will consequently ensure optimum exploitation of information sources lying dispersed in different institutions at different places.

The proposed network of medical universities and medical college libraries (APMEDLIBNET) envisages a wider accessibility of its resources, facilities and services to students, faculty, practitioners and researchers spread all over the state of Andhra Pradesh.

The NTR University of Health Sciences, Andhra Pradesh, has 32 constituent medical colleges. Out of the total 32, 11 are government and 21 are private medical colleges. In addition to them, there are two more medical institutes, namely, Nizam Institute of Medical Sciences (NIMS), Hyderabad and Sri Venkateswra Institute of Medical Sciences (SVIMS), Tirupati, in Andhra Pradesh. Networking of all these institutes’ libraries will facilitate access to large amount of information sources. Such a state level network programme can extend access to the health literature to all the health/medical institutions in the country.

4. Review of Literature

Ramesh Babu and Ashok Kumar discussed a prototype design of the public library networking ‘PUBLIBNET’ linking the State Central Libraries, District Central Libraries and other branches.
Mannan\(^6\) examines the need and importance of networking and resource sharing, including its existing status and problems, in the context of Bangladesh. An empirical survey of 25 libraries and 100 users from different categories was made to identify the collection status of books, periodicals, and other non-traditional items required for networking and resource sharing. The availability of human resources, computer hardware and software, tele and electronic communications, and reprographic facilities are evaluated.

Keeran\(^7\) describes the kind of information required for planning, implementation and evaluation of health service programmes. He highlights the importance of health of the people and the health problems they are facing due to climatic conditions, religious practices and social factors of their area. According to him, most of the rural health problems would automatically be solved through health education of the rural people. He makes out a case for national network of health information system in India. He mentions the nature of services and modern equipment required at different levels of information centres/libraries. He pleads for legal status for National Medical Library.

Satapathi\(^8\) states that there are more than 40 medical libraries in Calcutta city which, on the one hand, procure multiple copies of costly foreign journals and, on the other, cannot satisfy all the requirements of the users due to non-availability of many important journals. The situation can be enormously improved if these libraries form a network. This will enable them to avoid duplication and, at the same time, acquire other important journals without incurring extra expenditure. The essential features and requirements of such a network have been discussed.

Laxman Rao\(^9\) reports that information is the sixth basic need of human being. Quality of information increases its value. The latest technological developments provide an opportunity to improve information communication. Information Technology (IT) is the result of convergence of computers and telecommunications. Developments in IT had resulted in networks such as LAN, MAN and WAN. Existing analogue telephone system will be replaced by digital networks to have faster and accurate data transmission. Developments in Integrated Services Digital Network (ISDN) and Open Systems Interconnection (OSI) made an impact on information services and information communication. A brief account of networks in India is presented.

Jotwani and Mehla\(^10\) highlight the need for a national information network which could contribute significantly to the national effort of achieving “Health for All” by 2000 AD. The role of National Medical Library (NML), World Health Organization Southeast Asia Regional Office (WHO SEARO) and Medical Library Association of India in setting up of a network of Health Science Literature Library and Information Services (HELLIS) in India is discussed. Responsibilities and functions of the National Focal Point, i.e., NML, and other participating Libraries have been discussed. Regional Medical Libraries (RMLs) and Resource Libraries (RLs) are listed. The support provided by NML with the help of WHO SEARO in the form of equipment and training to RMLs and RLs has been enumerated. To
develop the HELLIS network into a computer communication network, a future plan of action is outlined.

Satpathi\textsuperscript{11} presents a study of networking of the health science libraries in West Bengal State of India as a case study. Health science libraries have been selected for the study as they have greater chance of success because of the homogeneous nature of their collection. The study uses questionnaire method for data collection and is supplemented by personal interviews.

Ravindra Kumar\textsuperscript{12} makes a perspective study of networking among Indian medical research institutions and primary health centres in rural areas, based on the literature published in Indian Science Abstracts, published by INSDOC.

Lyon and others\textsuperscript{13} conducted a survey at National Library of Medicine (NLM), which extends access to its products and services by making them available on the Internet. More accurate information about current and future access in medical libraries is needed. They reported the results of a questionnaire survey, undertaken by the National Network Office of the NLM of all member libraries of the National Network of Libraries of Medicine, to determine the extent of connectivity to the Internet and the barriers preventing 100 per cent connectivity. Respondents called a toll free number and using interactive voice technology, answered questions concerning Internet access in their library. Seventy eight per cent of the network member libraries responded. Four per cent of academic libraries, 27 per cent of hospital libraries, and 10 per cent of ‘other’ libraries reported that they were not connected. Computer cost, lack of in house expertise and lack of management support were the highest ranked barriers to connecting to the Internet. The NLM and the Regional Medical Libraries will use information from this survey to develop strategies to help all member libraries achieve full connectivity.

Kulanthaivel and Ravichandran\textsuperscript{14} focus on the network and Internet technology, MEDLINE database and sharing of health science information in a networked environment with shared Internet connectivity.

5. Need for the APMEDLIBNET

In view of the current developments in information technology, it is necessary that the Government of Andhra Pradesh should establish a network of medical university and college libraries to pool and share the information sources and disseminate the medical information to the users.

6. Objectives of APMEDLIBNET

The objectives of the proposed APMEDLIBNET are:

- To promote sharing of resources among the libraries of medical institutions in Andhra Pradesh;
• To coordinate efforts for suitable collection development and to avoid unnecessary duplication wherever possible;
• To develop a wide range of medical information services and enhance the quality of medical services using by the latest Information and Communications Technology (ICT);
• To evolve standards and uniform guidelines in techniques, methods, procedures, hardware, software and services for adoption by the participating libraries to facilitate pooling, sharing and exchange of resources and services;
• To establish a referral centre for maintaining a central online union catalogue of books, serials, project reports/dissertations/theses, institutional repositories, medical records and non-book materials of all participating libraries;
• To coordinate with other national and international networks for exchange of information and documents; and
• To take initiative for promotion of medical research and development.
• To coordinate efforts in the creation of institutional repositories and medical records.

7. Establishment of Governing Board for APMEDLIBNET

APMEDLIBNET is to be housed at NTR University of Health Sciences, Vijayawada. It acts as Central Information Facility (CIF) which controls other participating libraries. A governing body for APMEDLIBNET is to be established with representatives from Medical College Libraries and Medical University Libraries. The board should consist of 16 members comprising:

1. Vice-Chancellor of NTR University of Health Sciences, Vijayawada
2. Librarian of NTR University of Health Sciences
3. Five Principals (selected on rotation basis for a period of two years)
4. Six librarians from medical colleges (selected on rotation basis for a period of two years)
5. Librarian of NIMS, Hyderabad
6. Librarian of SVIMS, Tirupati
7. Director of National Informatics Centre, Hyderabad

The Vice-Chancellor of NTR University of Health Sciences will serve as the Chairman of the Board. The University Librarian of NTR University of Health Sciences will act as Member-Secretary for governing of the APMEDLIBNET. The main function of this governing board is to see that the objectives of APMEDLIBNET are fully implemented.

8. Recommendations for suitable library software for medical college libraries

The INFLIBNET of UGC has developed a library software package known as SOUL (Software for University Libraries) and made available to all academic libraries and
the R and D libraries in the whole country. The following are the important reasons for recommending the SOUL to the medical libraries of the Network.

1. This software is prepared mainly for the benefit of university and college libraries and followed standards and formats such as the CCF, AACR 2, and LCSH.
2. It is now being used by all university libraries in India, which have already been covered under financial assistance of the INFLIBNET.
3. It enables maintenance of uniformity in database creation among medical universities and medical college libraries for better information dissemination.
4. This software also included network feature, which is important for library network activities.
5. This software is available at a lower cost compared to other commercial library software packages. INFLIBNET offers free technical advice to the librarians wherever the SOUL software is used.
6. The SOUL is also user-friendly software and does not need elaborated training on use.

9. Pre-requisites for medical library network

In planning a medical library network, the following factors are considered as most important.

- Member medical university and medical college libraries must justify the need for a network in the region. Further, the development of viable network demands planning not only among the network members but also between the members and users themselves.
- Member medical libraries must agree upon a network policy, to be implemented. The policy must clearly state the objectives of the network, network structure, etc.
- Member medical libraries must identify the funding agencies and mobilize their financial resources in advance so that they freely flow, while implementing the system. If necessary, network fee may be collected from each of the member medical university and medical college libraries. Experience of several libraries in the Western countries suggests that all networks based on a fee structure can be maintained without grant and are viable in the long run.
- If there is no adequate trained manpower in the member medical libraries, attempts should be made to provide training to the existing librarians/library staff.
- Member medical libraries must have a full-fledged automation programme and a machine-readable catalogue for their respective document collections for the purpose of creating databases.
Member medical libraries must agree upon an indexing system to be followed. Each library may have the freedom to adopt an indexing system of its choice. In such cases, the software must be so developed as to enable switching from one system to another while searching. However, in a centralized database system, it is preferable to adopt a single system of indexing, i.e. the POPSI, Chain indexing or any other similar hierarchical system.

In addition to the databases (machine-readable catalogue), hardware, software and trained manpower, it is preferable to have certain other communication facilities such as E-mail, Fax, Telex and Telephones etc. as part of the network.

It is necessary to develop and agree upon performance on certain procedures to evaluate the working of the network.

10. Network architecture of APMEDLIBNET

10.1 Communication

There are three types of networking LAN, MAN and WAN. APMEDLIBNET comes under Wide Area Network (WAN), where the data transmission rate is 100 Kbps. The channel of communication can be categorized as:

- Through dedicated telephone links.
- Through satellite links.

As APMEDLIBNET is a state wide network, it could begin operations with telephone lines initially and later with satellite based communication.

10.2 Topology

10.2.1 Star topology

In Star network of computers, each computer is linked with the server. Therefore, whenever data is to be transmitted among any two, it should always be routed through the server. The networks are typically found in cases where a large scale central computer is connected to many terminals. Hence, star topology is the most preferred typology from the point of view of trouble shooting and suitability for newer networks. Some of the advantages are given below:

- Passing of data packet through unnecessary nodes is prevented by this topology.
- Each device is inherently isolated by the link that connects it to the hub.
The central network also allows the inspection traffic through the network. This can help analyze all the traffic in the network and determine suspicious behaviour.

The topology is easy to understand, establish, and navigate.

LAN or WAN are usually based on any one of the network topology like Star Network Topology, Ring Network Topology and Bus Network Topology. Star Network Topology is feasible and recommended for APMEDLIBNET. The nodes in APMEDLIBNET that have to be connected to the nodal centre ‘NTRUHS’ are shown in Fig. 1.

**Fig.1 Structure of APMEDLIBNET**

![Structure of APMEDLIBNET](image)

10.3 Hardware and Software requirements for server at nodal centre

10.3.1 Software requirements

- Windows 2007 Service Pack 2+ Security Rollup
- Microsoft SQL server 2007 or above
- MDAC 2.6 Service Pack 2
10.3.2 Hardware requirements

- Intel Xeon Processor
- 128 GB RAM
- Network Interface Card X2 10/100/1000 Mbps
- SCSI 1 to 10 TB Hard Disk
- Database Backup Solution
- UPS with at least 1 hour battery backup time or above
- DVD-RW
- Optical Mouse, Key Board
- Scanner
- Laser Printer Network Compatibility
- High Speed Internet connectivity

10.3.3 Hardware and Software requirements of the network nodes (clients)

10.3.3.1 Software requirements

- Windows XP Professional
- Graphics Software
- MS-Office 2007
- Library Software Package
- Microsoft SQL Server 2007 or above

10.3.3.2 Hardware requirements

- Intel P IV Core 2 Duo
- 2 GB RAM
- Network Interface Card X2 10/100/1000 Mbps
- SCSI 160 GB Hard Disk
- Optical Mouse, Key Board
- DVD-RW
10.4 Monitoring and feedback at Nodal Centre

To achieve the objectives of APMEDLIBNET, an effective monitoring of network is very essential. For the maintenance of it, sufficient funds should be made available and monitoring must also ensure that:

- Data conversion/generation in machine readable form.
- Memorandum of understanding should be signed by the members from libraries.
- Proper publicity is required so that the user gets up-to-date services offered by APMEDLIBNET.

10.5 Proposal for implementation

In the earlier part of the proposal, the structure of APMEDLIBNET has been presented with the requirements of hardware and software. Now a proposal for its implementation is presented here.

Successful implementation of the proposal for medical library network depends upon the following factors:

- Computer facility in each medical university library and college library.
- Adequate skills for the librarian to maintain computerizing activities and Internet services.
- Collection context and methods of database creation.
- Reliable telecommunication facilities such as phone and Internet connectivity, and
- Minimum infrastructure such as accommodation, furniture and equipment.

10.5.1 Phase-wise implementation

Implementation of the proposal for medical college library network is based on the following conditions:

- Introduction and development of computer awareness among readers i.e. students and staff of the medical university and college libraries.
- Creating awareness about the benefits of resource sharing among medical college libraries and the university libraries.
- Keeping to a minimum and within the reach of students and teachers the cost of information (or) the cost of service charges so as to encourage their use of library networking to have information access.

The proposal may be implemented in three phases, as shown below:
10.5.2 Phase I of implementation

- Establishing computers in the medical institution’s libraries.
- Acquiring suitable library software.
- Data creation.
- Establishing offline queries through CDs.
- Developing computer culture among students, teachers and staff of the college library.
- Obtaining Internet connectivity through the DOT, VSNL, etc.

10.5.3 Phase II of implementation

- Setting up the central host to establish medical college library network.
- Procurement of hardware required for the network and site preparation for each individual medical library.
- Establishing network connectivity from nodal centre NTRUHS, Vijayawada to medical universities and all medical college libraries in Andhra Pradesh.

10.5.4 Phase III of implementation

- Conversion of offline query to online query for the users of libraries which have machines set up connected to the network.
- The automation of all medical university and college libraries can be undertaken as one network and the necessary training facilities may be extended from time to time by NTRUHS, Vijayawada.

11. Conclusion

In a developing country like India, steps are being taken to disseminate medical information to medical professionals. Due to information explosion and limited financial resources, the resource sharing among libraries located in different geographical areas became a necessity. For better resource sharing, networking of libraries using Information Technology is essential. This proposal for medical library network is designed based on new technologies available for networking. This proposal will be of much use to any type of college library to go for networking, resource sharing and exchange of electronic information to meet the new challenges in the field of library and information services.

A feasibility study to implement this networking and to identify the gaps must be taken up so that the existing model could be suggested to the Andhra Pradesh Medical Libraries.
References

5. RAMESH BABU (B) and ASHOK KUMAR (S K). Networking of public libraries in India (PUBLIBNET): A prototype design. *Pearl*. 1; 2007; 22-29.
A STUDY ON THE USE OF E-JOURNALS AMONG THE STUDENTS OF K.S.RANGASAMY COLLEGE OF TECHNOLOGY, TIRUCHENGODE

T. Indrani
Librarian, K.S.R College of Education, Tiruchengode, Namakkal Dist. Tamil Nadu, India
And
Dr. V. Radhakrishnan
Professor / English, K.S.Rangasamy College of Technology, Tiruchengode, Namakkal Dist. Tamil Nadu, India

Introduction

Electronic Journals have been defined in different ways. The most common definition states, “a journal that is provided by any electronic means, e.g. Internet or CD-ROM, although not necessarily exclusive by electronic means.” (Ashcroft, 1999 p.105) These journals are generally accessible through electronic communication devices or telephone lines. The same definitions can be used for electronic newsletters and periodicals in electronic format.

Evolution of E - Journals

- Electronic journals that existed before the Web were the ones that relied on dial-up services and proprietary networks. The drawback for this kind of journal is the lack of photographs, tables, charts and back file. At the beginning, maintenance costs and proprietary interface were major problems for libraries, but in the recent years most libraries have been able to solve these problems. This kind of journal, however, could not replace the printed format.

- Electronic journals can be produced in different formats, such as a CD-ROM, which is the first step towards electronic publishing. Late 1988 and early 1990 various journals were published on CD-ROM mostly because of the increased storage capacity. The first step in the process was conversion of the journal from paper to electronic format, and then indexing, and the creation of bibliographic citations and abstracts. The significant advantage for CD-ROM was storage capacity. There were problems with publishing journals on CD-ROM such as: updating information, distribution, packing, and mailing. In addition, there was the high cost and lengthy time to develop, support, and continue to enhance proprietary software used to access the electronic journal. The other issue was that each journal had different editions with different interfaces and different ways of browsing, retrieving and displaying.
documents. Consequently, one of the reasons that a library would withdraw from the migration from paper to electronic journal was the lack of interface uniformity (Barnes, 1997).

- However, there are now forms of electronic journals that have all of the print version features and can therefore replace print. These journals are available through the vendor sites or directly from the publisher's sites and most of them are in Acrobat format. The electronic version duplicates the print version. The latest formats are the journals that do not have any print version and are published electronically. Specifically, in the academic and research libraries, the numbers of this type of journal is growing fast.
- It should meet the bibliographic definition of journal according to AACR2 the definition of a journal is “A Public action in any medium issued in successive parts bearing numerical or chronological designations and indented to be continued indefinitely”. A journal should preferably have an ISSN number (See www.issn.org)
- According to CONSER (The Cooperative Online SERials cataloging program)

A remote access electronic serial is a continuing resource that is accessed “via computer networks”. It is issued in a succession of discrete parts usually bearing numbering, and has no predetermined conclusion. This is in contrast to direct access electronic resource which is issued on a physical carrier such as CD-ROM or floppy disks (CONSER, 2004) http://www.loc.gov/acq/conser/

Various names such as

- Online journals
- Electronic serials or e-serials
- Electronic periodicals
- Zines or e-zines
- or webzines Digital serials or d-journals

Access to Electronic Journals:

The majority of electronic journals on-campus can be seamlessly accessed from a PC. However some titles may need an Athens or generic username and password, particularly if you are working off-campus.

E-Journals: advantages, disadvantages and criteria for selection

Azadeh Mirzadeh has written an excellent look at ePubs in the library:

- The Web, along with electronic publishing, has changed accessibility of serials and periodicals. In the past, scholars and researchers wrote their articles and published them in journals. Traditionally, library patrons and researchers came to the library to read or to make copies of these articles. To some extent publishers and vendors
competed to receive orders from libraries. The Web and on-line electronic publishing, however, have changed the way of accessing information for scholars and researchers. With the emergence of the Web and electronic publishing, scholars and researchers are able to publish articles on-line without going through a publisher or a vendor and users can access information without going to the library. Technology has brought an easier way of accessing information for librarians and researchers. Consequently, it has become very important issue for libraries regarding how and when to replace printed journals with electronic ones. One way that information has become accessible on the Internet is through electronic journals. The number of journals, magazines and newspapers that are available online has been grown rapidly in recent years. Tenopir (1999 p.138) reported " the number of titles in the ARL Directory has grown from only 26 in 1991 to nearly 2500 in 1997. The number of listings in full text sources on-line has grown from 4400 in 1993 to about 8900 as of May 1999." In the report regarding how quickly electronic journals are growing Aschroft (1999, p. 107) noted that “in the 18 months from September 1997 to March 1999 the number of electronic journals available increased by more than fifty percent... Not all these journals are scholarly in nature, but an increase can be seen across all genres."

Advantages

- There are four advantages for electronic documents: first, some documents are more useful in electronic form due to enhanced search ability, e.g. in allowing statistical calculations to be affected. Second, electronic format is sometimes the only alternative so it represents a net increase in the information base. Third, since the volume of printed materials is increasing at great speed and libraries can only offer a small part of it, it is important to provide electronic formats. The fourth advantage is economy of storage: the increase in cost for keeping printed material makes electronic forms more attractive from an economic viewpoint.

- Another benefit of electronic journals is availability for readers. Patrons can view journals when the library is not open if they have access to a network terminal. Also, invoicing and claiming will be on-line so, therefore, librarians will be having more time to improve their on-line skills and train users. It, also, offers speed of delivery, eliminates printing, and saves money in terms of postage costs for libraries.

Disadvantages

- Archiving and site licenses are the two major issues that most libraries have identified. Most of the electronic journals are not archived, therefore, libraries should be very careful about canceling printed subscriptions. Archiving becomes a critical issue for particular types of products, such as electronic journals and full-text databases. Also, libraries have learned that both storing large files of data and maintaining access to
them have additional costs in terms of staff, time, and other resources. Libraries are often hesitant to rely on electronic copies of titles for fear that archival access will not be maintained. (Davis, 1997)

- The lack of peer review of materials and slowness of the Internet and power outrages are other disadvantages of electronic journals. Reading a large amount of data on the screen also can be very difficult and can cause health problems such as back pain or vision problems.

Criteria for selecting electronic journals

- License and copyright agreements are legal matters that should be considered by libraries when they subscribe to electronic journals. These agreements must be fair and practical for both the publisher and library.
- Electronic journals are available in different ways. They are available directly from the publisher’s site and they have complete control over changes and pricing. The other way is that they are available through aggregators. Some publishers offer their electronic journals through an intermediary service, which aggregates the titles from many different publishers under one system or interface. In this way, publishers do not have to create or maintain their own separate system.
- Making student and faculty aware of electronic journals can accomplish in different ways. Cataloging is one way to show the public what is accessible and available in the library computer database collection. But some libraries are not cataloging their e-journals because such journals are not physically present in the library collection. Another way to inform the public about e-journals is to give details directly on the library’s web site through an e-journal’s section, preferably listing individual journals.
- Since new products become available every day and publishers are adding new features and new titles on a constant basis, it is impossible for librarians and libraries to have complete information about the new product.

STATEMENT OF PROBLEM:

To study on the use of E Journals among the students of K. S. Rangasamy College of Technology students in Tiruchengode. This study aims at analyzing the utilization of E Journals by the K.S.Rangasamy College of Technology.

Objectives

In order to pursue this study, the following objectives are framed, in accordance with the scope of this investigation:

- To analyze the commonly use e journals among the Engineering College students in K. S. Rangasamy College of Technology, Trichengode.
- To identify the reasons for using and the period of usage.
To find out the type of information uploaded.
To find out the level of usage of e journals
To rank the usefulness of some of the e journals.

Hypotheses

The following hypotheses are formulated on the basis of content and coverage of framed objectives and they are tested by employing appropriate statistical tools:

1) There is a significant association between Gender and Nativity of access of E - Journals.
2) There is a significant association among Age and Level of Usage E - Journals.

SCOPE AND LIMITATION

This study of the research used questionnaire- based survey method. The data were well checked and analysed for data analysis. The scope of the paper is to the students of engineering education from among seven departments and the study was limited to students from KSR Educational Institutions (KSREI), in Tiruchengode. A total of number 100 well-structured questionnaire was distributed to the students of UG & PG out of which 80 were returned duly filled in by the user’s community and the overall response rate was 80.00 percent. Percentage analysis was used to analyze the data which are obtained and descriptive analysis was used to interpret the results.

Methodology

This study attempts to examine the engineering college students attitude to E - Journals. The students of K.S.Rangasamy College of Technology have been chosen for the study. It is primarily a fact-finding venture. The identified facts are cross tabulated with the Gender, Department, Year of study, Age and Nativity of the respondents.

K.S.Rangasamy College of Technology Library

The College takes pride in having a Central Library housed in a three-storeyed block with a built up area of 1458 sq.m. The ground floor houses books stack area, circulation counter and online public access catalogue facility. The first floor houses Journal Section, Reference Section, Reprographic Section and Digital Library. The Library has more than 73,000 books and subscribing 367 journals which include national and international journals and magazines. In addition to books and journals, 13 e-journal packages are subscribed. Book Bank facility is also available for SC/ST students. All the back issues of journals are bound and kept for ready reference. There are separate library sections for MBA and MCA. All Departments have their own library to cater to the instant reference needs of faculty members. The Library has computerized all its housekeeping operations using in house development library software that is well maintained and updated regularly. NPTEL video
and web courses are also available. It uses the state-of-the-art technology in its function and services.

**Books and Journals**

**E - Journals**

**LIBRARY**

**2013 – 2014**

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| NPTEL Video Course     | 92       |                |
| NPTEL Web Course       | 126      |                |
| Back Volumes           | 5054     |                |
| Project Reports        | 7409     |                |
| Question Bank          | 1091     |                |

| E-Journals             | 1. IEEE  |
|                        | 2. ASCE  |
|                        | 3. ASME  |
|                        | 5. ASTM Digital Library |
|                        | 6. Springer Link |
|                        | 7. J-Gate Engineering & Technology |
|                        | 8. Science Direct |
|                        | 9. Elsevier – Nano Technology |
|                        | 10. Elsevier – Bio Technology |
|                        | 11. J-Gate Management Sciences |
|                        | 12. ProQuest |
|                        | 13. Institute of Electronic Library (IEL) |
|                        | 14. Nature Publishing Group |
|                        | 15. CMIE – Prowess |

| Membership             | 1.Delnet |
|                        | 2. ACM   |
|                        | 3.IEEE   |
Sampling

K.S. Rangasamy College of Technology is selected for the purpose of the present study. The college has 6500 students. The researcher has selected 100 respondents as samples on the basis of stratified random sampling. 20 questionnaires were found invalid with incomplete data and thus 80 questionnaires are used for the present study. The rate of response is 80%.

Data Collection

The researcher has employed a well structured questionnaire for collecting the data from the respondents of K.S. Rangasamy College of Technology.

Data Analysis

The collected data are classified and tabulated according to the objectives and hypothesis stated. First, the data are recorded on data sheets and then fed into the computer personally.

In order to test the hypothesis, the chi-square test has been applied. In order to measure the respondents’ frequency and relevance of using internet resources, the five point rating scale is applied.

DATA ANALYSIS AND RESULTS

The study has been conducted at KSR Educational Institutions (KSREI), in Tiruchengode during the period of 2014. This study was undertaken to investigate the study on the use of electronic journals among the students of KSR Educational Institutions (KSREI), Tiruchengode.

Table 1: Gender-wise Respondents

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Response</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Male</td>
<td>62</td>
</tr>
<tr>
<td>2.</td>
<td>Female</td>
<td>38</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>
Fig. 1: Gender-wise Respondents

![Pie chart showing gender distribution](image)

Table 2: Age-wise Respondents

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Age in Years</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>21 - 25</td>
<td>71%</td>
</tr>
<tr>
<td>2.</td>
<td>26 - 30</td>
<td>19%</td>
</tr>
<tr>
<td>3.</td>
<td>31 - 35</td>
<td>10%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Fig. 2: Age-wise Respondents

![Bar chart showing age distribution](image)
Table 3: Department-wise Respondents

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Department</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>UG</td>
<td>34%</td>
</tr>
<tr>
<td>2.</td>
<td>PG</td>
<td>66%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Fig. 3: Department-wise Respondents

![Department](image)

Table 4: Discipline-wise Respondents

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Discipline</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>BE Mech</td>
<td>22%</td>
</tr>
<tr>
<td>2.</td>
<td>BE EEE</td>
<td>32%</td>
</tr>
<tr>
<td>3.</td>
<td>BE ECE</td>
<td>29%</td>
</tr>
<tr>
<td>4.</td>
<td>BE EIE</td>
<td>17%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Fig. 4: Discipline-wise Respondents

![Discipline](image)
Table 5: Nativity-wise Respondents

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Discipline</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Urban</td>
<td>59%</td>
</tr>
<tr>
<td>2.</td>
<td>Semi Urban</td>
<td>35%</td>
</tr>
<tr>
<td>3.</td>
<td>Rural</td>
<td>16%</td>
</tr>
<tr>
<td>4.</td>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Fig. 5: Nativity-wise Respondents

![Nativity](image)

Table 6: E – Journals used-wise Respondents

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>E-Journals</th>
<th>Regular</th>
<th>Often</th>
<th>Occasionally</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>IEEE</td>
<td>73</td>
<td>22</td>
<td>5</td>
</tr>
<tr>
<td>2.</td>
<td>ASCE</td>
<td>70</td>
<td>19</td>
<td>11</td>
</tr>
<tr>
<td>3.</td>
<td>ASME</td>
<td>65</td>
<td>27</td>
<td>8</td>
</tr>
<tr>
<td>5.</td>
<td>ASTM Digital Library</td>
<td>58</td>
<td>26</td>
<td>16</td>
</tr>
<tr>
<td>6.</td>
<td>Springer Link</td>
<td>62</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>7.</td>
<td>J-Gate Engg &amp; Tech</td>
<td>70</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>8.</td>
<td>Science Direct</td>
<td>38</td>
<td>47</td>
<td>15</td>
</tr>
<tr>
<td>9.</td>
<td>Elsevier – Nano Technology</td>
<td>52</td>
<td>20</td>
<td>28</td>
</tr>
<tr>
<td>10.</td>
<td>Elsevier – Bio Technology</td>
<td>61</td>
<td>21</td>
<td>18</td>
</tr>
<tr>
<td>11.</td>
<td>J-Gate Management Sciences</td>
<td>21</td>
<td>51</td>
<td>28</td>
</tr>
<tr>
<td>12.</td>
<td>ProQuest</td>
<td>24</td>
<td>31</td>
<td>45</td>
</tr>
<tr>
<td>13.</td>
<td>Institute of Electronic Library (IEL)</td>
<td>30</td>
<td>22</td>
<td>48</td>
</tr>
<tr>
<td>14.</td>
<td>Nature Publishing Group</td>
<td>14</td>
<td>15</td>
<td>71</td>
</tr>
<tr>
<td>15.</td>
<td>CMIE – Prowess</td>
<td>14</td>
<td>19</td>
<td>67</td>
</tr>
</tbody>
</table>
Fig. 6: Journals used-wise Respondents

![Bar chart showing the usage of various journals.]

Table 7: Purpose of Using-wise Respondents

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Discipline</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Information</td>
<td>16%</td>
</tr>
<tr>
<td>2.</td>
<td>Project</td>
<td>38%</td>
</tr>
<tr>
<td>3.</td>
<td>Research</td>
<td>29%</td>
</tr>
<tr>
<td>4.</td>
<td>Reference</td>
<td>17%</td>
</tr>
<tr>
<td>5.</td>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Fig. 7: Purpose of Using-wise Respondents

![Pie chart showing the purpose-wise usage of journals.]

[Diagram showing the distribution of uses: Information 16%, Project 38%, Research 29%, Reference 17%.]
Table 8: Level of Usage wise Respondents

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Discipline</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>High Satisfaction</td>
<td>49%</td>
</tr>
<tr>
<td>2.</td>
<td>Satisfaction</td>
<td>32%</td>
</tr>
<tr>
<td>3.</td>
<td>Not Satisfaction</td>
<td>19%</td>
</tr>
<tr>
<td>4.</td>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Fig. 8: Level of Usage wise Respondents

Table 9: Time spent per day wise Respondents

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Discipline</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>&lt; 30 mts</td>
<td>34%</td>
</tr>
<tr>
<td>2.</td>
<td>30 – 1 hr</td>
<td>26%</td>
</tr>
<tr>
<td>3.</td>
<td>2 hrs</td>
<td>22%</td>
</tr>
<tr>
<td>4.</td>
<td>&gt; 2 hrs</td>
<td>18%</td>
</tr>
<tr>
<td>5.</td>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Fig. 9: Time spent per day wise Respondents
FINDINGS, SUGGESTIONS AND CONCLUSION

As expected a wide variety of data was collected from the sample population, but the main findings suggested that although all respondents do use some SNS, only a limited number of SNS were being used frequently in order to determine whether the degree of choice influences on attitudes towards SNS. Based on the analysis the following findings are listed below.

FINDINGS

1. More than half of the respondents (62%) are female and the remaining 38% of respondents are male.
2. Majority 71% of the respondents are from the age group of 21 - 25 years followed by 19% of the respondents belonging to 26 - 30 age groups.
3. 66% of the respondents have the PG department followed by 34% of the respondents belonging to the UG department.
4. 32% of the respondents are from the BE EEE, 29% of the respondents are from BE ECE, 22% of the respondents are from BE Mech and 17% of the respondents are from BE EIE.
5. More than half of the respondents (59%) are from the urban areas 35% of respondents are from semi urban area and 16% of them are from rural area.
6. Purpose for using E – Journals that 38% of the respondents belonged to the project. 29% belonged to the research. 17% are from the reference. 16% are from the belong to information circle.
7. 34% use it for less than 30mts, 26% of the respondents spent more than 30 minutes to one hour per day.
8. Regarding the level of usage of the e journals by the respondents: 49% voted as high satisfaction, 32% as satisfaction and 19% of the respondents have expressed it as not satisfaction.
9. The E Journals used frequently of different items was rated as regular, often and occasionally. 73% as regular, 22% as often and 5% as occasionally as far as Institute of Electrical and Electronics Engineers (IEEE) is concerned, 70% rated it as regular, 19% as often, 11% as occasionally as far as American Society of Civil Engineers (ASCE) , 65% as regular and mere 15% as occasionally used American Society of Mechanical Engineers(ASME). Regarding McGraw Hill Access Engineering Library 63% rated it as regular, 22% as often, 15% as occasionally, 58% as regular and 26% as often for American Society for Testing and Materials Digital Library (ASTM) 62% have rated it as regular, 18% as often, 20% as Springer Link. For J-Gate Engineering & Technology 70% rated it as regular 18% as often. Regarding Science Direct 38% rated it as regular, 47% as often and 15% as occasionally.

For Elsevier – Nano Technology 52% have rated it as regular, 28% as occasionally. As far as Elsevier – Bio Technology is concerned majority of 61% rated it as regular, 21% as often. J-Gate – Management Sciences majority of 51% rated it as often, 28% as occasionally. The
reaming ProQuest is concerned 45% rated it as occasionally, 31% as often. The next one is Institute of Electronic Library (IEL) wherein 48% have rated it as occasionally, 30% as regular. For Nature Publishing Group majority of 71% have rated it as occasionally, 15% as often. The final one is CMIE –Prowess the majority of 67% rated it as occasionally and 19% rated it as often.

TESTING OF HYPOTHESIS

1. On the basis of the data, it is calculated that the null hypothesis (Ho) is accepted because the calculated value of \( x^2 \) between gender and nativity and the uses of E-Journals is less than (4.03), table value (11.07) at 5% level of significance. The related relationship is positive.

2. There is a negative relationship between age of the respondents and the period of used satisfaction of the respondents using of E-Journals.

It is calculated from the variable namely the age of respondents and the level of usage by the respondents showed a negative relationship = -0.78.

SUGGESTIONS

A few suggestions are framed to fasten the SNS activities in the college.

- The timings of the internet service should be increased and if possible, the service should be made available round the clock so that the users can make maximum use of the internet (E-Journals) facility.
- There is a need for E-Journals with the latest specifications and versions. So that the users can use E-Journals telephony, video – conferencing, chatting and other useful services of the E-Journals.
- There should be complete campus networking with the internet (E-Journals) browsing facility connecting the teachers’ rooms as well as hostels.
- The problem of slow connectivity should be overcome by increasing the bandwidth.
- Sites providing only entertainment should be locked so that the staff would not unnecessarily use E-Journals.
- Printing facility should be provided in the internet section of the colleges so that the users can get printouts of their study material and other important documents at nominal rates.
- Some orientation training programme may be organized by the colleges at regular intervals so that the maximum users can improve their excellence or proficiency in the E-Journals for academic purposes.
- All the academic news should be provided at the college website and it should be regularly updated. Information regarding the popular and the latest websites with their addresses should be displayed on the notice board in the computer centre.
• Capacity of servers should be increased and firewalls should be installed for protection from viruses.

Some of the major electronic journal publishers are:

• Academic Press IDEAL (International Digital Electronic Access Library) <http://www.apnet.com>
• Blackwell\'s Electronic Journal Navigator. <http://www.blackwell.co.uk/>
• Dialog@CARL <http://Dialog.CARL.org>
• EBSCO <http://www.EBSCO.com>
• OCLC<http://www.OCLC.org/OCLC/menu/eco.html>
• Project Muse/ Johns Hopkins University Press <http://museljhu.edu>

CONCLUSION

In the world of knowledge economy, the guest of knowledge has the capability to takes one to unparalleled heights. When libraries with their bound volumes of books have been catering to this need, they are supplemented by the soft copies of materials. It is no doubt that the e-journals will play a key role in the acquisition of knowledge by the needy in the future.

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DEVELOPING FREE DIGITAL LIBRARY
EXPERIENCES FROM SREENIDHI INSTITUTE OF
SCIENCE & TECHNOLOGY – LIBRARY

Dr. M. Suresh Babu
Librarian,
Sreenidhi Institute of Science & Technology,
Ghatkesar, R.R.Dist 501 301

INTRODUCTION

The Library is the hub of information and it is essential for every organization an academic institution. Library play vital role in teaching and research activities, without library services the academic goal cannot be achieved. The concept of digital library is growing fast. Now a days electronic publishing and resources sharing have become very easy and convenient. These changes have resulted in the evolution of libraries in to digital libraries. Today digital library is considering World Wide Web. Digital libraries are not different from traditional libraries and have same goal like collection, development and management, subject analysis, index creation, provision of access reference work and preservation, but digital libraries are quicker and much faster in providing information on worldwide user. The internet has given us the means for creating, digital libraries. Digital library has become the buzzword in the modern library and information science discipline. The primary aim of digital library is to make uninterrupted access to content over computer and communication network. Instead of holding books, the digital library is evolving into an electronic portal to provide access to a growing global collection of digital content.

Digital library is a repository of digital documents and a set of programs that manage the digital documents. According to Ian Witten et al. digital library is collection of digital objects including text, video, and along with methods for access and retrieval. And for selection, organization and maintenance of the collection.

OBJECTIVE OF DIGITAL LIBRARY:

Digital libraries can be entirely in an information society from to not entirely compatible dimensions: Intellectual property and evolving technologies to serve communities of learning. The major objectives of digital library are listed in as under

1. To collect, store, organize and retrieve digital information.
2. To reduce cost involved in various library operations.
3. To introduce and provide new services to the library users.
4. To provide personalized and retrospective services to the user.
5. To provide coherent view of all information within library in any format.
6. To minimize massive storage and space problem in libraries.
7. To provide facility for networking and resource sharing.
8. To save the time of library staff by avoiding routine jobs.

NEED FOR DIGITAL LIBRARY

Today the information explosion has increased in all subjects like as science, humanities and social science and libraries facing problem to maintain their service but with the help of technology we can improve the quality of library services. We fulfill our needs and some of these are mentioned below.

1. To collect, store, organize and access information in digital form.
2. To promote the resource sharing
3. To save the library staff and time by avoiding routine work
4. To encourage the economical and efficiently delivery of information
5. Accessible on www
6. To fulfill the requirement of users by providing better service

ELEMENT OF DIGITAL LIBRARY

- Network: LAN, MAN, WAN, Internet etc.
- Printer: Laser printer, Dot matrix, Barcode printer, Digital graphic printer etc. Scanner: H.P. Scan jet, flatbed, Sheet feeder, Drum scanner, Slide scanner, Microfilming
- scanner, Digital camera, Barcode scanner etc.
- Storage devices: Optical storage device, CD-ROM, jukebox etc.
- Software: Any suitable software, which is interconnected and suitable for LAN and WAN connection

FEATURES OF DIGITAL LIBRARY

The various features identified for digital library

1. Provide access to very large information collection.
2. Focus on providing access to primary (or complete) information, not merely surrogates or indexes.
4. Provide user friendly interface, to access the information.
5. Enable link representation to local/external objects (hypertext)
7. Support advanced search and retrieval of information Linkage with other national and international digital library system.
8. Support-advanced search and retrieval

DIGITAL LIBRARY SERVICES

Digital library services provide consulting, applications, and infrastructure to help libraries create, manage and preserve digital content for the use. Digital Library Services provides a wide array of services to assist members of the library with organizing collections of materials or making them more widely available. The following services offered by the Digital Libraries.

- Catalogue Databases,
- Making scholarly journals accessible on the web.
- Hosting digital collection and indexes
- Current Awareness Bulletins,
- CD-ROM Databases,
- Remote Information Services
- Internally Published Newsletters, Reports & Journals, Internet Information,
- Electronic Document Delivery Services
- Reference Service,
- Electronic Publishing,
- Web-based reference and information services,
- Search engine services,

DIGITAL LIBRARY INFRASTRUCTURE

A digital library has certain technological requirements such as:

- Locally developed database
Local library system with adequate personal computers having LAN and CD-ROM Drives.
- Electronic mail service
- Network connection to have access to other data bases
- Various functions to coordinate manage the entry and retrieve data.
- Multimedia Kit
- Well trained manpower
- Computer Hardware with Audio-Visuals, Video Conferencing Kit, Pentium Web Server, Laser Printer, Scanner, Barcode Scanner, Barcode Printer, Digital graphic printer and UPS.
- Software and its accessories.

ADVANTAGES OF DIGITAL LIBRARIES

The benefits of information collections in digital form for preservation and access and in management of large quantities of information have been recognized by both library professionals as well as users. Digital libraries can store a large volume of digital information in archival form. It provides the users fast search tools, immediate access to the rapidly-growing information in multimedia form quickly on the screen in an interactive mode; it also offers access to expensive and special collections of information from any remote location and by multiple simultaneous users. The fundamental reason for building digital libraries is that they provide better delivery of information than was possible in the past. Arms have provided a comprehensive list of potential benefits of digital libraries as follows:

- The digital library brings the library closer to the user: A digital library brings the information to the user’s desk, either at work or at home, making it easier to use and hence increasing its usage. With a digital library on the desk top, a user need never visit a library building. The library is wherever there is a personal computer and a network connection. The access to the collections expands beyond ‘working hours’.

- Computer power is used for searching and browsing: Computing power can be used to find information considered to be better than manual methods for finding information particularly for reference work that involves repeated leaps from one source of information to another. Hyperlinks to other sources within a source provide obvious advantages.

PRESENT SCENARIO IN INDIA

All the six IITs (Indian Institute of Technology) created as centres of excellence for higher training, research and development in science, engineering and technology, have automated their libraries and now they have access to more than one thousand electronic journals. The Central Library IIT, Delhi has switched over to the Silver Platter’s Electronics Reference Library (ERL) technology for providing access to bibliographic databases subscribed on CD-
ROM. The technology facilitates simultaneous and integrated access to ERL complaint reference databases to multiple users across the LAN / WAN Via TCP / IP. This library offers network-based CD-ROM search services from the CD-ROM databases subscribed in the central library. Most of its databases have now been transferred to ERL technology and its CD-NET system has been installed for searching of CD-ROM databases on the campus intranet. This Library has started subscribing to the web-based full-text electronic journals with availability of high speed INTERNET connection and about 1330 electronic journals are accessible full text.

SREENIDHI INSTITUTE OF SCIENCE & TECHNOLOGY

The scenario of new thrust in the field of science & technology is to have new breeds of engineers & technocrats with special skill-sets, attitude and adaptability with no end. The present day technical education requires multi-dimensonal learning and curriculum and they need to be in pace with global trend. So these students require a comprehensive platform with good educational institutions to learn with innovative quality and leadership. The SNIST holds the noble objective of promoting innovative and creative brains in the field of technology with strong moral and ethical values.

SREENIDHI INSTITUTE OF SCIENCE & TECHNOLOGY is college locate at Yamnampet, Ghatkesar, R.R.Dist. 15 Kilometers from Uppal X Road, 25 Kilometer from Dilsukhnagar, Hyderabad.

SNIST’S LIBRARY & INFORMATION CENTER

SNIST central library has an unique, up to date, multi – facted and contains print and non – print media. It is located in the Ground Floor Room No 5113, occupies the space of 3000sft, Seating capacity 200, and caters to the needs of staff and students. The library’s total collection is 1,26,209 volumes International Journals 50, National Journal 166, Magzines 13 back volumes 7340, project reports 2100 across various disciplines.

Few of the facilities are Access to

1. Online Public Access Catalogue (OPAC) the entire library collection was computrezied and can be searched by :
   
   - Author
   - Title
   - Subject / Keyword
   - Access Number

2. Syllabi of various courses
   
   - B.Tech
B. M.Tech  
C. VAUGHN  
D. M.B.A  
E. M.C.A

3. Previous Question Papers:
   a. B.Tech  
   b. M.Tech  
   c. VAUGHN  
   d. M.B.A  
   e. M.C.A

4. E-Resources
   A. E-Books  
   B. E-Journals

5. Jobs Portal for easy access important websites like:
   - Andhra Pradesh Public Service Commission: http://www.apspsc.gov.in
   - Employment News: http://www.employmentnews.gov.in
   - Govt Jobs: http://www.govtjobs.co.in
   - Sarkari Naukari: http://sarkarinaukari-govtjob.com

The author want to convey their special thanks to the **Executive Director** SREENIDHI INSTITUTE OF SCIENCE & TECHNOLOGY

**CONCLUSION**

Digital information is, and will be, treated differently than paper-based information. It is likely that in the near future, the terms of accessibility and the condition for management and collection of electronic information will not be determined by the library profession. The transition of traditional library collections to digital or virtual collections presented the librarian with new opportunities. They have created many digital library initiatives and projects, and have formed various national schemes for jointly exploring key issues. With several years accumulated experience, the initial enthusiasm surrounding the development of the digital library has been replaced by sober second thought. Librarians have discovered that, with a few exceptions, making a business case for digitization and investments in digital technology is more difficult than first envisioned, especially given the technical and legal constraints that must first be overcome.
REFERENCES

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IMPLEMENTATION OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN MARIS STELLA LIBRARY: A STUDY

Dr. Rani Syamalamba
Librarian,
Maris Stella College (Autonomous), Vijayawada-8

Abstract

Higher education has been undergoing continuous changes under the effects of globalization. Libraries are experiencing enormous changes due to the application of Information Technology. The library is a place where information is disseminated to needy clients in a user-friendly environment professionally. The application of computer for various library operations was a significant development in the latter part of the last century. The present paper discusses the impact of Information Technology on academic libraries and its impact in the case of Maris Stella College (Autonomous), Vijayawada, Andhra Pradesh. It is reaccredited at ‘A’ level by NAAC and has been conferred the status of college with Potential for Excellence (CPE)

Introduction

Education is the process by which people not only acquire knowledge and information, skill, but also values and ability to live and interact within social groups. Higher education contributes to human resource development in many ways. The institutions of Higher Education have the main responsibility of training the students who participate in the development of the country.

Higher education is undergoing continuous changes under the effects of globalization. The introduction of Information Technology has led to changes in Higher education. As a result the role of academic libraries is also changing. The library is a place where information is disseminated to the needy clients in a user-friendly environment professionally. The application of computer for various library operations was a significant development in the latter part of the last century.

In recent years the academic libraries stood against the fast improvement of technology, with low budget and with more requirements for responsibility. Because of these, new strategies of renewal have been developed at a quick pace. A first step, which is necessary for a library, is to define which approach in the procedure of change is more appropriate for itself, considering the size, the environments and the conditions of function that apply in that particular library.
Impact of Information Technology

Information Technology (IT) has transformed Library and Information services globally. At present Internet has provided universal access to information. Technological innovation and ICT has dramatically increased the rate of conversion of knowledge, information and data into electronic format. Developments in the software field have generated powerful knowledge management software which has transformed the way knowledge is organized, stored, accessed and retrieved.

In the present scenario the medium of publication for journals and other forms of literature is shifting from paper print to electronic and their mode of distribution is now network centered. The use of computers in libraries has become inevitable. Now most of the libraries are automated and their card catalogues are shifted to online catalogues. Some of the large libraries are using computer net works using communication satellites for resource sharing purposes, which enables the participating library to obtain not only bibliographic details from other library’s collection but also full text, indexes and abstracts of required articles using e-mail, fax, LAN and Internet attached to the system.

Implementation of ICT in Maris Stella Library

Founded in 1962 at Vijayawada, Maris Stella College, a Catholic Christian Minority Institution for Higher Education, has been a first-rate college, which has focused on the education of women and is the first Women’s college in the District. It was started by the same management of Stella Maris College, Chennai, namely the Society of Franciscan Sisters of Mary. The college aims at an integrated and personalized formation of young women. It strives to produce intellectually competent, morally upright, socially committed and spiritually inspired women imbued with the values of Christian humanism in the service of India today and tomorrow.

It was accredited by NAAC in 1999 and granted Autonomous Status in 2003. Maris Stella College stands for empowerment, excellence, enhancement of knowledge and culture, commitment to society and its aspiration for growth with equality, justice and respect for all persons. The college was reaccredited with ‘A’ grade in 2013 with conferment of CPE (College with Potential for Excellence) status. It has made an excellent progress growing from strength to strength.

A lot of changes in the organizational structure or in the services have been noticed since 1999 in the institution. The changes that have taken place are obvious at every level. The organization and function of the Stella Library started in 1962 in a small hall with a collection of 3015 books. The library was shifted to the new two-strayed library building situated in the center of the campus in 1977. There were two big halls for reading and reference for staff & students. Separate rooms were also there for staff for reference. There were three stack rooms with 10 double-faced library racks in each room for keeping books.
Enthusiastic attempts were made since 1999 for the quality improvement in the area of information and in the area of serving user’s needs.

At present the library has a collection of 81,000 books including reference books and bound periodicals. All the books are arranged according to DDC in open access system both for inter and degree students. For the PG students there is a separate library with a collection of 9000 books. At present the library has subscribed 70 periodicals and 80 Journals. Reference section was separated from the general section in the year 1998. Video, audiocassettes and CDs/DVD’s are also available for staff members for their innovative teaching. Since 1999, there have been attempts for the implementation of ICT for improvement in the area of information and in the area of serving user's needs.

**Library Automation**

One of the most important efforts for the quality improvement has been the automation of the library catalogue. Automation of library started in the year 1998. At first CDS/ISIS Software package was installed for the data entry. Most of the data was entered in this package. Afterwards the data was changed into another software. Since 2008 Newgenlib library software is adopted for all library operations which is user friendly. The server is connected to four clients, which are used for circulation. Dot matrix printer and laser printers are connected for printing purpose for all the systems in LAN.

As soon as the books are purchased, all the details are entered in the system and the accession register is printed, and all the sheets are filed according to the Accession Number. Computerized accession register was started in 1999. Previously the bibliographic details were entered in the register and the process was time consuming. After the introduction of computer in the library the work has become easy and time saving. Before the introduction of automation much time was spent in preparation of different types of catalogues and registers. But now information on different fields such as author, title, subject, class no, publisher so on are easily accessible with just the click of the key through OPAC in Intranet.

**Automated circulation**

From 2002 onwards circulation of books through computers began. User can get the information if he knows any one field such as Author, title, acc.nos so on. In September 2002 in place of library tickets a new borrower’s book was introduced for students and staff. Code numbers are allotted to the staff and students for easy transaction. Previously call slips and library tickets were used for issue of the books, and it would take a lot of time. Introduction of borrower book has saved much time and effort for both the library staff and users. While borrowing the books the borrower has to produce the borrower’s book.

As we are maintaining different types of registers, prefixes have been used to all the books accessioned. By entering the ID no, it is possible to get all the details of the user like total number of books borrowed, title along with author and issue and due dates which will
make the work of staff very easy. Users are also much satisfied as they have to spend less time near the counter and can glance at all their details on the screen. Even though it has taken nearly three years to update the data, now the users and the library staff are satisfied with the work, as they have been spared of the problems faced in manual method. The automation demands for a perfect data that in turn helps to retrieve any kind of information, with ease.

**Implementation of Barcode Technology:**

In 2002 the Implementation of barcodes was started. Compared to manual data collection, bar coding works very fast and is error free. We can give input of data at three times the speed of manual entry. Bar code technology is applied for maintaining records of borrowers and reading material.

It is noticed that the time taken at the circulation counter is reduced to fifty percent due to the application of bar code technology. The practice of issuing library tickets to users has been discontinued. In place of library tickets, a library borrower book has been introduced. Every student and staff member has been issued a book. Personal details like name, ID number, class; group/department, validity period etc with a photograph are printed on the card with barcode.

When a book is issued or received from a user, the counter staff scans the bar code membership number from the member’s ID book whether any book is overdue. The staff then scans the bar code number from the book and then issues it. With this the transaction is completed and the book is issued to the member and it gets updated simultaneously in the database.

In the old system library tickets were given to the staff and students for the issue of books. Fifteen tickets were given to faculty members and three tickets to students. Earlier soon after the receipt of a new book, the details were entered in the accession register. The routine practice was to prepare author card, subject card, shelf list card and book pockets for each and every book by manual typing. After the application of computers all bibliographic details are entered in the system and a print out is taken (accession register) to reduce the burden on library staff.

Ten systems are arranged in the library to search for the bibliographic details of a book. Search option is arranged for this purpose in such a way that a user can choose any one of the options like author, title, subject, publisher, series, class. No, call no, ISBN no. and so on. This is a great help to all the users. It has been observed that both students and staff are happy with this OPAC (On Line Public Access) system.
Bar coding of books

All the books in the library are bar coded now. This work was started during the summer of 2004. The aim was to make the books available at the time of reopening. We took the help of students paying them on hourly basis to finish this task in time. Thus we were able to complete the bar coding of the entire collection. From 2012 onward printed spine labels are pasted to all the collection.

Charge Couple Device (CCD) scanner is used for reading the bar code from the borrower’s card and book instead of entering the accession number using keyboard. When the bar codes are scanned the details of both borrower and the book are displayed on the screen. This will reduce the error percentage at the circulation counter. Three barcode scanners available in the circulation counters.

Bar-coding the existing books:

Proper planning was needed and various ways and means were used for completing barcoding of all the already accessioned books. We had different accession registers. These registers have parallel sequence in accession numbers. So we have used prefixes for all the registers. The following are the prefixes for the accession numbers.

For already existing accession numbers, we have gone in for pre printed bar code labels for the books. We use in house generated bar code labels for the new arrivals from June 2004. A laser printer is used for printing bar code labels. As the new books are entered in the system the bar code labels are printed along with them and sent to the technical section for pasting.

As soon as the list of students admitted into various courses in the first year is received, we generate bar code labels. These labels are pasted on the library borrowers books and issued to students after registration at the counter. An orientation is given to the students about the use of the library at the very beginning of the academic year, with power point presentation.

After bar coding the identity cards and books, the circulation desk operations become efficient and error free. Every new technology includes both benefits and problems. In this case, compared to problems, benefits are certainly more. One should be careful while entering the data. Uniformity should be maintained for retrieving the data accurately from the database.

Internet & Multimedia Centre

To improve the quality of services Internet & Multimedia centres are started in the library in 2004. They are twenty systems in the Internet centre with broadband connection and free access is provided for students and staff.
Online Public Access (OPAC)

This is the most useful IT service for the staff and students in a college library. Students and staff can browse the collection, availability of books and journals in the library without going to the racks. They can also see the circulation data by logging into the OPAC. They can reserve the book and also can renew the book and can also see the latest collection. They can also browse the digital attachments (content pages of journals) provided by the library sitting in front of the system, which is not possible in a traditional system. This facility is provided to all the departments through intranet. From 2012 onwards staff publications are also uploaded in the database.

Knowledge Resource Centre

Apart from the internet centre in the campus, recently a Knowledge Resource Centre with six computers has been started. This centre offers internet browsing, online competitive exam materials. Students can also watch CD’s and DVD’s available in the library according to their subject knowledge.

Research Centre

Research Centre has been started in the library 2006 under CPE for English Literature and Economics. There are twenty five scholars actively involved in research from various Universities for M.Phil and PhD programmes both for part time and full time. There are three full fledged research supervisors recognized by Acharya Nagarjuna University. The library provides various library services like CAS, SDI, reference service and OPAC to know the latest books in their respective field of research. Library provides computers and internet facility for ready reference besides to update their subject knowledge with the help of latest e-journals and printed journals. (Primary and secondary sources)

Recently the research centre has equipped books worth Rs.15 lacks in both economics and English for advanced research. That is another feather in the cap of Maris Stella.

E-journals:

As a part of Quality Improvement Services, we subscribe n-list programme of INFLIBNET from 2006 onwards to improve the research attitude of the staff and students. At present under n-list users can browse 6000+ ejournals and 97000+ ebooks. We provided web links in our library website to provide free access of e-journals which are available freely on web. (www.marisstella.ac.in)

Web tutorials:

Web Tutorials for OPAC, Library Tour, and E-resources like N-list, NEPTEL programmes are developed by using free software “Jing” and are placed on the library
website. Training programmes are conducted to all the UG and PG students. Direct links are provided in the library site for free e-resources to make better use of e-resources. Orientation programmes are conducted for staff also to make use of e-resources.

**Library staff:**

The modern tendency in the libraries is the theory of the "development of human potentialities" with main target the satisfaction of the personal needs of employees and their continuous education; with purpose their adjustment to the new technological developments. The aim and the targets of the library are realized with the support of the high professional training of its staff on issues concerning the function and the library organization.

**Role of Library staff in providing IT services**

Staff is the main component of the library. No institution can run without adequate and trained manpower. Modernization of the library includes automation of library activities, building digital resources and Internet connectivity with adequate speed for accessing online information. Thus the librarian should have the knowledge and experience regarding the use of library automation software, networking and digital library software. Without the knowledge of technology the librarian will not be able to implement the IT techniques in the library.

Maris Stella has a professionally qualified librarian with a doctoral degree in the said discipline, asst librarians and also PG librarian. All are qualified, professionally trained with computer knowledge. As a team they work together in developing IT services to the users within the budget limits. They try to improve their knowledge by attending seminars, workshops, and refresher courses. As the librarian of their institution the writer of the paper attended many seminars, workshops and always strives to implement that knowledge in the library to the possible extent. After she attended the web designing workshop, she has developed the library website and made it available to staff and students.

**Conclusion**

It is indisputable that to achieve excellence in Higher Education the role of academic libraries is of paramount importance. The institutions have to be quality conscious, if they have to sustain and survive in this competitive world. For this, every library has to try its best to improve its quality and also services according to the changing needs of the users.
ROLE OF METADATA IN DIGITAL RESOURCE MANAGEMENT

Dr. Varshil Bhagaji Dashrath
Librarian
College of Agriculture, Baramati.
Email: varshilpb@gmail.com

Abstract

Metadata is data about data, Metadata serves many important purposes like data description, data browsing, data transfer, and metadata has an important role in digital resource management. Metadata means machine understandable information to identify, locate and or describe web resources. Selection and metadata issues which surround the preservation of digital information are discussed, in particular the role of metadata in all aspects of the system design and describing how the notion of metadata is sometimes. Capture data about the items in our digital collection for a variety of purposes and use those data to drive the entire system.

Keywords: Collection Management, Digital Preservation, Preservation Metadata, Selection for Preservation, Dublin Core

Introduction:

Metadata is data about data, Information about information. Metadata means machine understandable information to identify, locate and or describe web resources. We know the card catalogue in the library. Those cards contained the title of the book, subject of the book, author, date of publication, pages of the book. Those card catalogues were metadata. This catalogue card is a form of metadata. MARC 21 and set of rules used with it, such as AACR2 and metadata standards, Metadata can include bibliographic information, Libraries and librarians have been involved with metadata for a long time. They called it as cataloguing rules, controlled vocabulary Indexing format etc. for machines they have developed. A set of conventions to enable machine exchanges of cataloguing records. Dublin Core has the potential of being adapted as an international standard for resource description and discovery on the web and as linger Franca for metadata, partly because of the simplicity. In recent development of digital libraries, Librarians have joined the other efforts related to metadata.

What is Metadata?

Metadata is data about data. “Data associated with objects, which relieves their potential users having to have full advance knowledge of their existence and characteristics. In other words standard bibliographic information summaries, indexing terms and abstracts is all surrogates
for the original material, hence metadata. The term metadata is generally applied to e-resources and refers to “data” in the broadest sense of data sets, textual information, graphics and anything else that is likely to appear electrically. Information about authenticity, availability and accessibility, digital signature, copyright, reproduction etc is also metadata.

Metadata Definitions:

The common definition of metadata is “data about data”. Metadata describes the attributes of information bearing object document, data set, database, image, artificial, collection etc. Metadata acts as a surrogate, representation of the content, context, structure, quality, province, condition and other characteristics of document for the purpose of representing the document to a potential user for discovery, evaluation, and fitness for use, access, transfer, and citation.

Getty Information Institute (2000): “Metadata includes data associated with either an information system or an information object for purposes of description, administration, legal requirements, technical functionality use and usage and preservation.”

Velucci (1998) defines: “Metadata is data that describes attributes of resources, characterize its relationships, support its discovery and effective use and exist in an electronic environment.”

Three features of metadata:

1) Content: Content relates to what the object contains or is about, and is intrinsic to an information object.
2) Context: Context indicates who, what, why, where, how aspects associated with the objects creation and is extrinsic to an information object.
3) Structure: Structure relates to the formal set of associations within or among individual information objects and can be intrinsic or extrinsic.

Types of Metadata:

- **Administrative Metadata**: Administrative metadata provide information to manage to resource e.g. when and how the resource has created.
- **Descriptive Metadata**: Descriptive metadata provide the source purpose e.g. title, abstract, author etc.
- **Structural Metadata**: Information necessary to record the internal structure of an item so that it can be rendered to the user in a sensible form (for instance, a book must be delivered in its page order.) This type of metadata is necessary as in item may often be comprised of multiple (often thousands) of files. For example, the images of individual pages that makes up a digitized book.
Role of metadata in digital resource Management:

Metadata Applications:

An increasing numbers and types of digital objects on Internet, It was recognized that raw data was of little value without information about how it was collected the purpose for which it was intended, formats, platforms for viewing and manipulating and restriction on reproduction and uses, aside from more conventional information such as author producer title, subject, and abstract.

Metadata serves many important purposes like data description, data browsing, data transfer, metadata has an important role in digital resource management. Metadata is playing key role in digital information system.

1) **Metadata increases accessibility:** Main role of metadata is resource discovery searching and location of resource.

2) **Metadata for Interoperability:** Metadata have compatibility of information structures for information retrieval and exchange.

3) **Metadata for Multi-Versioning:** Multi-versions of the same object may be created for preservation research, dissemination / product development purpose. The creator may include same administrative and descriptive metadata for this purpose.

4) **Metadata for Right Management:** Metadata allows depositors to track the many layers of rights and reproductions of information that exist for information objects and their multiple versions.

5) **Metadata for Preservation:** Technical descriptive and preservation metadata help to know now a digital object was created and maintained how it behaves, and how it relates to other digital objects. It should note that for the digital objects to remain accessible and intelligible essential to preserve and Migrate the metadata also.

6) **Metadata for system Improvement:** Metadata is also helpful to evaluate and refine systems in order to make them more effective and efficient from a technical and economic stand point. The data can also be used in planning for new system.

Metadata Standards:

There are several metadata standards.

1) AGLS: Australian Government Locater service.

2) ANZLIS: Australia New Zealand Information Council

3) CIMI: Consortium for the Computer Interchange Museum Information

4) DC: Dublin Core

5) EAD: Enclosed Archival Description

6) ENDA: Education Network Australia.
7) GILS Government Information Locator service.
8) TEI Text Encoding Initiatives.
10) METS Metadata Encoding Transmission Standards
11) MODS Metadata Object Description Schema

Why Metadata Standards?

1. Build on common and shared efforts.
2. Minimise duplication of efforts
3. Facilitate sharing and exchange of information between organizations/ Libraries.
4. Promotes collaboration
5. Reduce Web Fragmentation
6. Reduce costs.

Dublin Core Metadata Standard:

The Dublin Core (DC) is the most popular and widely accepted metadata standard proposed to describe almost all categories of networked electronic resources. OCLC and National Centre of Supercomputing Application (NCSA) developed it jointly and the conceptual framework was developed in the March 1995 workshop sponsored by the OCLC and NCSA to advance the state of the art in the development of metadata records for networked information resources. One of the goals of workshop was to reach as consensus on a simple and core set of metadata elements to describe e-resources. The result of workshop was a set of 13-metadata elements, which was called Dublin core metadata Elements (DCME) for describing what called Document like objects. By the third workshop the elements set was developed to 15 elements.

The Dublin Core Metadata Element (DCME) set includes; Title, Creator Subject, Description, Publisher, Contributor, Date, Type, Format, Identifier, Source, Language Relation, Coverage and Rights.

Dublin Core Metadata Elements (DCME):

The Dublin Core has a set of fifteen Core descriptive elements relating to content, Intellectual property etc. The applications of Dublin Core elements have been designed to cover not only the types of resource in traditional repositories of information, but also on the Internet web. Each of the elements is repeatable and can also have sub type and sub-object relationships. The element sets describe the simple resource description designed to be used by content creators.
The Uses of Metadata:

The metadata use is in facilitating the process of search, identification, choice, assessment and documentation of network resources that bring about faster and precise recalling. The Lukas mentions three main functions about metadata:

- In collection, it provides the capability to separately identify each informational entry/item.
- It provides multi-mode methods to access and find each informational entry.
- It places the existing information in each informational entries, information and knowledge.

Other uses of metadata are as follows:

- Organizing informational resources,
- Organizing resource through address, subject, ...
- Using metadata designs, exchange protocols and sharing network resources,
- Classifying metadata results,
- Content analysis and indexing,
- Facilitating data analysis path,
- Preserving and conserving digital data,
- Tracking information resource record,
- Determining access level,
- Determining legal conditions regarding data use,
- Recognizing data structures,
- Data interaction capability,
- Assessment of informational resources,
- Finding resources through related subject,
- Placing similar resources side by side,
- Identifying and distinguishing dissimilar resources,
- Suggesting information location,
- Suggesting information that affects data users like legal conditions/ size/ etc,
- Suggesting data history like main source and every other subsequent change,
- Suggesting information about owner or creator of the source (to establish link) link e-mail address,
- Showing relationships with other sources such as links to previous and subsequent copies of the source,
- Helping to decide about what form and frame of the data should be recalled,
- Providing indexing possibility of large amount of different network information without need to network band width,
• Facilitating efficient search and recall of information sources and rendering complex and complete information search possible to designed elements for precise content analysis of the data,
• Organizing informational recourses present in the network,
• Describing informational bases, digital images, phonetic files and other non–written resources in the network,
• Content analyzing and indexing and organizing various informational sources in the network,
• The possibility of adapting, sharing and integrating and integrating dissimilar informational sources in the network,
• Providing the possibility to reuse various informational sources distributed in network environment through document information content,
• More precise management of large amount of information in network and digital libraries,
• Describing informational sources, like text, images, phonetic files and the like,
• Providing the possibility to access precise and related data by users.

Use of Metadata in Informational Source Management:

Through expressing museum objects characteristic, metadata describes them in a systematic way:

Asadi (2002) regarding metadata importance for organizing informational resources in an article entitled “Metadata understanding and its standards” deems it necessary to create new patterns and standards to store, organize and precisely recall digital resources while referring to metadata as a response to this new need. He introduces Doblin Core, METS and MODZ metadata designs that were introduced in this paper, as the most Frequently used metadata designs in booting and organizing digital resources.

Actors, roles and metadata:

When analyzing potential benefits of reuse and refinement of metadata, we found it necessary to look into who creates - and benefits from the creation of – metadata. Each role has a set of Interests connected with it, and these interests are what determine the Metadata needs of immediate interest.

Actor: An entity that plays an active part in the lifecycle of the resource and that can create, refine, use and circulate metadata. Every actor can act in different roles. Actors can be:

• Individuals
Role/s: A role is defined by action. Each action is connected with a certain stage in the life cycle of the resource. Roles are creator, publisher, distributor, access provider and end user.

- Creator: an entity primarily responsible for making the content of the resource.
- Publisher/Distributor: an entity who issues or makes available publications to the public.
- Access provider: one or more institution(s) or system(s) that give end users access to resources.
- End user: one or more individual(s) or group(s) that consume (use, read, listen to, reuse) the content of the resource.

Metadata created: the metadata actually created by an actor in one of his/her roles.

What metadata is created depends on the actor, his/her behavior and which tools are used. Eventual discrepancies between metadata needs and metadata created pose the questions whether this is a good idea. (E.g. is MARC really the best format/tool for a library serving as a publisher, access provider? Could the individual using MySpace to publish and give access gain from being able to create more "library-like" metadata? Etc.)

IMPLEMENTATION OF METADATA CREATION ACTIVITIES:

Choosing metadata standards for a digital library project

- Metadata for a purpose
- Factors to consider
- Functions of metadata standards
- Using multiple standards
- Notes

Creating metadata usage guidelines:

- Continuing to plan
- Topics to cover in metadata usage guidelines
- Writing, testing, and refining usage guidelines
- Notes
Creating metadata:

- The metadata creation process
- Designing a metadata creation workflow
- User interfaces for metadata creation
- Creating metadata directly in XML
- Benefits of learning XML technologies
- Quality control for metadata creation
- Notes

Practical implementation of a metadata strategy:

- Staffing
- What it means to be a metadata specialist
- Integrating metadata work into a larger infrastructure
- Financial implications
- Notes

CONCLUSION:

Metadata is data about data, Metadata serves many important purposes like data description, data browsing, data transfer, and metadata has an important role in digital resource management. Metadata is playing key role in digital information system. The Dublin core Metadata Element set includes; Title, Creator Subject, Description , Publisher, Contributor, Date, Type, Format, Identifier, Source, Language Relation, Coverage and Rights.

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BIBLIOMETRIC CITATIONS IN PH.D. THESIS IN LIBRARY AND INFORMATION SCIENCE AT BHARATHIDASAN UNIVERSITY, TIRUCHI

M. Ravichandran
Research Scholar, Bharathiar University,
Librarian, Prathyusha Institute of Technology and Management, Tiruvallur -602 025.
E-mail: ravichandran.pitam@gmail.com

Dr. G. Sivaprasad
Lecturer, Department of Library and Information Science,
MVGRR Degree College, Guntur, Batipurlu, AP.
E-mail: sivaprasad_gorantla@yahoo.co.in
And

Mr. K. Manoharan
Research Scholar, SCSVMV University, Kanchipuram
Librarian SVCE Engineering College, Sriperumandur
E-mail: mano@svce.ac.in

Abstract

The present study analyses the preferences and usage of different types of information resources used by the research scholars to write PhD theses in the discipline of Library and Information Science. The citations examined different type of literatures cited such as journal articles, books, databases, theses and reference sources. The results indicate that researchers have cited nearly 69% of journals used for their research, the researchers have cited more foreign journals.

Key words: Bibliometric, Citation Studies, Ph.D, Theses, Library and Information Science and Journals.

1. INTRODUCTION

Bibliometrics has become a standard tool of science policy and research management in the last decades. All significant compilations of science indicators heavily rely on publication and citation statistics and other, more sophisticated bibliometric techniques. Today, bibliometrics is one of the rare, truly interdisciplinary research fields to extend to almost all scientific fields. Bibliometric methodology comprises components from Mathematics, Social Sciences, Natural Sciences, Engineering and even Life sciences.

The term ‘Bibliometrics’ and Sciometrics were almost simultaneously introduced by Pritchard and Nalimov and Mulchenko in 1969. While Pritchard explained the term
‘Bibliometrics’ as “the application of mathematical and statistical methods to books and other media of communication”.

In 1927 Gross and Gross published their citation-based study in order to aid the decision which periodicals should best purchased by small college libraries. In particular, they examined 3633 citations from the 1926 volume of the journals of the American Chemical Society. This study is considered about the first citation analysis, although it is not a citation analysis in the sense of present day bibliometrics.

1.1. Journal citation Measures

Journal citation measures are one of the most widely used bibliometric tools. They are used in information retrieval, scientific information, library science and research evaluation. They are applied at all levels of aggregation. The main source of journal citation measures is the annually appearing Journal citation Report (JCR). The most important measure is the Impact Factor (Garfield, 1979). The impact factor for the journal J in the year n is defined as the ratio

\[
\text{IF}_n(J) = \frac{cn}{P_{n-1} + P_{n-2}}
\]

Where \( cn \) is the number of citations received in the year \( n \) by papers published in the journal J in the years \( n-1 \) and \( n-2 \) and the total number of source items (\( P_{n-1}+P_{n-2} \)) published in the journal J in these two years (\( n-1 \) and \( n-2 \)).

The Immediacy Index is defined analogously to the Impact factor as a journal citation measure of citations received in the publication year, particularly,

\[
\text{In}(J) = \frac{cn}{P_n}
\]

2. Source Theses for the present study

The source theses of the present study belongs to Bharathidasan University in the department of library and information science submitted from the year 2008 to 2012. The thesis, downloaded from the “Shodhganga” is the name coined to denote digital repository of Indian Electronic Theses and Dissertations set-up by the INFLIBNET Centre. Theses and dissertations are known to be the rich and unique source of information, often the only source of research work that does not find its way into various publication channels. Theses and dissertations remain an untapped and under-utilized asset, leading to unnecessary duplication and repetition that, in effect, is the anti-theses of research and wastage of huge resources, both human and financial. Shodhganga” is the name coined to denote digital repository of Indian Electronic Theses and Dissertations set-up by the INFLIBNET Centre.

3. Objective of the Study

- To identify different type of Bibliographic form used by researchers
4. Methodology

The source of the data for the present study is the four Ph.D. Theses submitted to Bharathidasan University during the year 2008-12. In this discipline of library and information science, a total number of 4 theses in 791 citations were found in the four thesis, each thesis was manually examined and citations were extracted from the references and bibliographical sections of the four thesis. The data extracted were analysed using MS-Excel software.

5. Data Analysis:

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<td>Current content</td>
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<td>0.25</td>
<td>787</td>
<td>99.49</td>
</tr>
<tr>
<td>9</td>
<td>Thesis</td>
<td>1</td>
<td>0.13</td>
<td>788</td>
<td>99.62</td>
</tr>
<tr>
<td>10</td>
<td>Review</td>
<td>1</td>
<td>0.13</td>
<td>789</td>
<td>99.75</td>
</tr>
<tr>
<td>11</td>
<td>Patent</td>
<td>1</td>
<td>0.13</td>
<td>790</td>
<td>99.87</td>
</tr>
<tr>
<td>12</td>
<td>Lecture notes</td>
<td>1</td>
<td>0.13</td>
<td>791</td>
<td>100.00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>791</td>
<td>100.00</td>
<td>791</td>
<td>100</td>
</tr>
</tbody>
</table>
The table-5.1 shows the different bibliographic form-wise distribution of articles cited by the researchers, 791 citations cited by the researchers in 12 bibliographic forms. Highly cited articles in journals is 68.90%. Electronic resources, articles cited is 13.02%. Conference Proceedings, Articles cited is 7.59% books cited is 5.56%. Bulletin articles cited is 2.28% reports cited only is 1.64% and other remaining 6 bibliographic forms cited below 1.00%.

Table-5.2

Subject Wise Citation of resources

<table>
<thead>
<tr>
<th>S.No</th>
<th>Subject</th>
<th>No. of Citations</th>
<th>Percentage</th>
<th>Cumulative Number</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Library Science</td>
<td>736</td>
<td>93.05</td>
<td>736</td>
<td>93.05</td>
</tr>
<tr>
<td>2</td>
<td>Computer Science</td>
<td>35</td>
<td>4.42</td>
<td>771</td>
<td>97.47</td>
</tr>
<tr>
<td>4</td>
<td>Social Science</td>
<td>3</td>
<td>0.38</td>
<td>774</td>
<td>97.85</td>
</tr>
<tr>
<td>5</td>
<td>Atmospheric Science</td>
<td>3</td>
<td>0.38</td>
<td>777</td>
<td>98.23</td>
</tr>
<tr>
<td>6</td>
<td>Virtual Environments</td>
<td>2</td>
<td>0.25</td>
<td>779</td>
<td>98.49</td>
</tr>
<tr>
<td>7</td>
<td>Physics</td>
<td>2</td>
<td>0.25</td>
<td>781</td>
<td>98.74</td>
</tr>
<tr>
<td>8</td>
<td>Mobile Communication</td>
<td>2</td>
<td>0.25</td>
<td>783</td>
<td>98.99</td>
</tr>
<tr>
<td>9</td>
<td>Internet Adoption</td>
<td>2</td>
<td>0.25</td>
<td>785</td>
<td>99.24</td>
</tr>
<tr>
<td>10</td>
<td>Economics</td>
<td>2</td>
<td>0.25</td>
<td>787</td>
<td>99.50</td>
</tr>
<tr>
<td>11</td>
<td>Management Studies</td>
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<td>0.13</td>
<td>788</td>
<td>99.62</td>
</tr>
<tr>
<td>12</td>
<td>Higher Education</td>
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<td>0.13</td>
<td>789</td>
<td>99.75</td>
</tr>
<tr>
<td>13</td>
<td>Environmental Science</td>
<td>1</td>
<td>0.13</td>
<td>790</td>
<td>99.88</td>
</tr>
<tr>
<td>14</td>
<td>E-Business</td>
<td>1</td>
<td>0.13</td>
<td>791</td>
<td>100.00</td>
</tr>
</tbody>
</table>

The table 5.2 shows the different type of subjects cited by the researchers in the 791 citations highly cited subjects in library and information science is 736 articles 93.05%. The researcher cited not only Library science articles. He is cited Computer science articles is 4.42%, Social Science and Atmospheric Science article is each 0.38%, Virtual Environment, physics, Mobile Communication Internet Adoption and Economics articles are each 0.25% and Management Studies Higher Education, Environmental Science and E-Business each article is 0.13%.

Table- 5.3. Language-wise distribution of articles

<table>
<thead>
<tr>
<th>S.No</th>
<th>Language</th>
<th>Number of Citations</th>
<th>Percentage</th>
<th>Cumulative Citations</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>English</td>
<td>781</td>
<td>98.74</td>
<td>781</td>
<td>98.74</td>
</tr>
<tr>
<td>2</td>
<td>Chinese</td>
<td>10</td>
<td>1.26</td>
<td>791</td>
<td>100.00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>791</td>
<td>100.00</td>
<td>791</td>
<td>100.00</td>
</tr>
</tbody>
</table>
The table -5.3 shows language-wise distribution of articles. The researcher cited only two languages highly cited language is in English that is 98.74%. Chinese language articles cited only is 1.26%.

Table-5.4

Country –wise distribution of articles

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>Country of Origin</th>
<th>Number of Citation</th>
<th>Percentage</th>
<th>Cumulative Number</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
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<td>261</td>
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<td>261</td>
<td>33.00</td>
</tr>
<tr>
<td>2</td>
<td>UK</td>
<td>217</td>
<td>27.43</td>
<td>478</td>
<td>60.43</td>
</tr>
<tr>
<td>3</td>
<td>India</td>
<td>201</td>
<td>25.41</td>
<td>679</td>
<td>85.84</td>
</tr>
<tr>
<td>4</td>
<td>Netherland</td>
<td>66</td>
<td>8.34</td>
<td>745</td>
<td>94.19</td>
</tr>
<tr>
<td>5</td>
<td>China</td>
<td>14</td>
<td>1.77</td>
<td>759</td>
<td>95.96</td>
</tr>
<tr>
<td>6</td>
<td>Malaya</td>
<td>6</td>
<td>0.76</td>
<td>765</td>
<td>96.72</td>
</tr>
<tr>
<td>7</td>
<td>Africa</td>
<td>4</td>
<td>0.51</td>
<td>769</td>
<td>97.22</td>
</tr>
<tr>
<td>8</td>
<td>Pakistan</td>
<td>4</td>
<td>0.51</td>
<td>773</td>
<td>97.73</td>
</tr>
<tr>
<td>9</td>
<td>Iran</td>
<td>3</td>
<td>0.38</td>
<td>776</td>
<td>98.11</td>
</tr>
<tr>
<td>10</td>
<td>Australia</td>
<td>2</td>
<td>0.25</td>
<td>778</td>
<td>98.36</td>
</tr>
<tr>
<td>11</td>
<td>Czech Republic</td>
<td>2</td>
<td>0.25</td>
<td>780</td>
<td>98.61</td>
</tr>
<tr>
<td>12</td>
<td>Singapore</td>
<td>2</td>
<td>0.25</td>
<td>782</td>
<td>98.87</td>
</tr>
<tr>
<td>13</td>
<td>Sri Lanka</td>
<td>2</td>
<td>0.25</td>
<td>784</td>
<td>99.12</td>
</tr>
<tr>
<td>14</td>
<td>Taiwan</td>
<td>2</td>
<td>0.25</td>
<td>786</td>
<td>99.37</td>
</tr>
<tr>
<td>15</td>
<td>Yugoslavia</td>
<td>2</td>
<td>0.25</td>
<td>788</td>
<td>99.62</td>
</tr>
<tr>
<td>16</td>
<td>Brazil</td>
<td>1</td>
<td>0.13</td>
<td>789</td>
<td>99.75</td>
</tr>
<tr>
<td>17</td>
<td>Canada</td>
<td>1</td>
<td>0.13</td>
<td>790</td>
<td>99.88</td>
</tr>
<tr>
<td>18</td>
<td>Switzerland</td>
<td>1</td>
<td>0.13</td>
<td>791</td>
<td>100.00</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>791</td>
<td>100.00</td>
<td>791</td>
<td>100.00</td>
</tr>
</tbody>
</table>

The table-5. 4 shows the country-wise distribution of articles, the researcher cited 16 countries article for his research USA (261) 33 % of articles, UK (217) 27.43% of the articles, India (201) 25.41%, Netherland (66) 8.34% and other remaining 12 countries article cited by the researchers is below 2%.

5.1. Multiple authorship and Collaborative Research

Collaboration among scientists is a common phenomenon in the scientific community, As scientific research has become more complex, the multiple disciplinary approach to various studies became necessary, and this involved collaboration between
scientists from various fields and disciplines. The present section is devoted to the study of authorship patterns, the average number of authors per citation i.e (author/article ratio) and the degree of collaboration in the discipline of Library and Information science as a whole, and its different sub disciplines.

5.1.1. Authorship pattern in Journal Citations:

The distribution of citations to articles in journals in Library and Information science in relation to the number of authors is presented in the table 5.5. Papers with multiple authors (2-6 authors) are the highest in number, comprising 55.23 percent of the total citations. Single authored papers occupy second place with 44.77 percent.

Table 5.5

<table>
<thead>
<tr>
<th>Year</th>
<th>Single</th>
<th>Two</th>
<th>Three</th>
<th>Four</th>
<th>Five</th>
<th>Six</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965-70</td>
<td>3</td>
<td>60.00</td>
<td>2</td>
<td>40.00</td>
<td>0</td>
<td>0</td>
<td>40.00</td>
</tr>
<tr>
<td>1971-75</td>
<td>2</td>
<td>66.67</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>66.67</td>
</tr>
<tr>
<td>1976-80</td>
<td>5</td>
<td>71.43</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>28.57</td>
<td>71.43</td>
</tr>
<tr>
<td>1981-85</td>
<td>12</td>
<td>54.55</td>
<td>10</td>
<td>45.45</td>
<td>0</td>
<td>0</td>
<td>45.45</td>
</tr>
<tr>
<td>1986-90</td>
<td>15</td>
<td>62.50</td>
<td>5</td>
<td>20.83</td>
<td>3</td>
<td>12.50</td>
<td>40.00</td>
</tr>
<tr>
<td>1991-95</td>
<td>24</td>
<td>70.59</td>
<td>4</td>
<td>11.76</td>
<td>5</td>
<td>14.71</td>
<td>57.35</td>
</tr>
<tr>
<td>1996-2000</td>
<td>46</td>
<td>53.49</td>
<td>28</td>
<td>32.56</td>
<td>7</td>
<td>8.14</td>
<td>33.33</td>
</tr>
<tr>
<td>2001-05</td>
<td>75</td>
<td>39.89</td>
<td>75</td>
<td>39.89</td>
<td>26</td>
<td>13.83</td>
<td>39.89</td>
</tr>
<tr>
<td>2011-12</td>
<td>0</td>
<td>0.00</td>
<td>4</td>
<td>66.67</td>
<td>1</td>
<td>16.67</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>244</td>
<td>44.77</td>
<td>190</td>
<td>34.86</td>
<td>69</td>
<td>12.66</td>
<td>100.00</td>
</tr>
</tbody>
</table>

5.1.2. Average number of Authors per citation (Author/Article ratio) and Degree of Collaboration:

The growth in the proportions of both collaborative papers and the number of authors in a discipline depends to some extent on the type of research. The average number of authors per citation denotes a rough estimation of the extent of the collaboration in a discipline. Table 5.6 presents the average number of authors per citation in Library and information science. The highest fluctuate somewhat in the beginning, but later show a
marked increase. The highest author/article ratio is 2.50 (during 2011-12), and the average author/article ratio for the period under the study is 1.92.

Table-5.6

Average Number of Authors per citation in journals

<table>
<thead>
<tr>
<th>Reference Period</th>
<th>Total No. Of Citations</th>
<th>Total No. Of Authors</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965-70</td>
<td>5</td>
<td>7</td>
<td>1.4</td>
</tr>
<tr>
<td>1971-75</td>
<td>3</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>1976-80</td>
<td>7</td>
<td>11</td>
<td>1.57</td>
</tr>
<tr>
<td>1981-85</td>
<td>22</td>
<td>32</td>
<td>1.45</td>
</tr>
<tr>
<td>1986-90</td>
<td>24</td>
<td>39</td>
<td>1.63</td>
</tr>
<tr>
<td>1991-95</td>
<td>34</td>
<td>52</td>
<td>1.53</td>
</tr>
<tr>
<td>1996-2000</td>
<td>86</td>
<td>144</td>
<td>1.67</td>
</tr>
<tr>
<td>2001-05</td>
<td>188</td>
<td>361</td>
<td>1.92</td>
</tr>
<tr>
<td>2006-10</td>
<td>170</td>
<td>381</td>
<td>2.24</td>
</tr>
<tr>
<td>2011-12</td>
<td>6</td>
<td>15</td>
<td>2.50</td>
</tr>
<tr>
<td>Total</td>
<td>545</td>
<td>1048</td>
<td>1.92</td>
</tr>
</tbody>
</table>

5.2. Ranking and Scattering of Cited Journals

The ranked list is essentially a practical tool designed to aid the practicing librarians and researchers in selecting the journals of maximum utility in relation to their coverage of nascent and important literature in particular subject fields. In this section, the ranking, productivity and scattering of cited journals in Library and information science are discussed.

5.2.1. Ranked list of Cited Journals:

The ranked list of journals in the field of Library and Information Science is presented in Table 5.7. The journals on the table may be considered as the preferred channel for the communication of new knowledge in the Library and Information Science.

It is observed from the table-5.7 that the Journal Citations cited by the researchers in the field of Library and Information Science are distributed among 74 journals. Out of these, Scientometric occupies the first rank with 13.58 percent in first rank, followed by journal of Annals of Library and Information studies (10.09%), in the second rank SREL$S$ Journal of Information Management (3.85%), Third rank, Annals of Library Science and Documentation (3.49), fourth rank Library Review and Resources sharing and Information Networks. Both journals are in (3.12%) fifth rank and the remaining all are below 3%.
### Table-5.7

**Ranking of Journals**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Rank</th>
<th>Title of the Journal</th>
<th>Country</th>
<th>Number of Citations</th>
<th>Percentage</th>
<th>Cumulative Citations</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
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<td>Netherland</td>
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<td>13.58</td>
<td>74</td>
<td>13.58</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Annals of Library and Information Studies</td>
<td>India</td>
<td>55</td>
<td>10.09</td>
<td>129</td>
<td>23.67</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>SRELS Journal of Information Management</td>
<td>India</td>
<td>21</td>
<td>3.85</td>
<td>150</td>
<td>27.52</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>Annals of Library Science and Documentation</td>
<td>India</td>
<td>19</td>
<td>3.49</td>
<td>169</td>
<td>31.01</td>
</tr>
<tr>
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<td>5</td>
<td>Library Review</td>
<td>UK</td>
<td>17</td>
<td>3.12</td>
<td>186</td>
<td>34.13</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>Resour. Share &amp; Info. Networks</td>
<td>USA</td>
<td>17</td>
<td>3.12</td>
<td>203</td>
<td>37.25</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
<td>Electro. Lib</td>
<td>UK</td>
<td>16</td>
<td>2.94</td>
<td>219</td>
<td>40.19</td>
</tr>
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<td>8</td>
<td>7</td>
<td>IASLIC Bulletin</td>
<td>India</td>
<td>12</td>
<td>2.20</td>
<td>231</td>
<td>42.39</td>
</tr>
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<td>9</td>
<td>8</td>
<td>Interlending &amp; Document Supply</td>
<td>UK</td>
<td>11</td>
<td>2.02</td>
<td>242</td>
<td>44.41</td>
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<td>9</td>
<td>DESIDOC.J.Lib&amp; Info Tech</td>
<td>India</td>
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<td>1.65</td>
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<td>46.06</td>
</tr>
<tr>
<td>11</td>
<td>9</td>
<td>Geomatics and Info Sci</td>
<td>China</td>
<td>9</td>
<td>1.65</td>
<td>260</td>
<td>47.71</td>
</tr>
<tr>
<td>12</td>
<td>9</td>
<td>J. Inter. Lib. Loan, Docu. Deli &amp; Electro. Reserve</td>
<td>UK</td>
<td>9</td>
<td>1.65</td>
<td>269</td>
<td>49.36</td>
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<td>9</td>
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<td>UK</td>
<td>9</td>
<td>1.65</td>
<td>278</td>
<td>51.01</td>
</tr>
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<td>14</td>
<td>10</td>
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<td>UK</td>
<td>8</td>
<td>1.47</td>
<td>286</td>
<td>52.48</td>
</tr>
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<td>10</td>
<td>J. Informetrics. Sci</td>
<td>Netherland</td>
<td>8</td>
<td>1.47</td>
<td>294</td>
<td>53.95</td>
</tr>
<tr>
<td>16</td>
<td>11</td>
<td>Academic Exchange Quarterly</td>
<td>USA</td>
<td>7</td>
<td>1.28</td>
<td>301</td>
<td>55.23</td>
</tr>
<tr>
<td>17</td>
<td>11</td>
<td>College &amp; Research Libraries</td>
<td>USA</td>
<td>7</td>
<td>1.28</td>
<td>308</td>
<td>56.52</td>
</tr>
<tr>
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<td>11</td>
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<td>India</td>
<td>7</td>
<td>1.28</td>
<td>315</td>
<td>57.80</td>
</tr>
<tr>
<td>19</td>
<td>11</td>
<td>J. Info. SCI. Tech</td>
<td>USA</td>
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<td>1.28</td>
<td>322</td>
<td>59.08</td>
</tr>
<tr>
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<td>11</td>
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<td>UK</td>
<td>7</td>
<td>1.28</td>
<td>329</td>
<td>60.37</td>
</tr>
<tr>
<td>21</td>
<td>11</td>
<td>The International Information &amp; Library Review</td>
<td>USA</td>
<td>7</td>
<td>1.28</td>
<td>336</td>
<td>61.65</td>
</tr>
<tr>
<td>22</td>
<td>12</td>
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<td>USA</td>
<td>6</td>
<td>1.10</td>
<td>342</td>
<td>62.75</td>
</tr>
<tr>
<td>23</td>
<td>12</td>
<td>Journal of Library and Information Science</td>
<td>Brazil</td>
<td>6</td>
<td>1.10</td>
<td>348</td>
<td>63.86</td>
</tr>
<tr>
<td>24</td>
<td>12</td>
<td>Reference &amp; User Services Quarterly,</td>
<td>USA</td>
<td>6</td>
<td>1.10</td>
<td>354</td>
<td>64.96</td>
</tr>
<tr>
<td>25</td>
<td>12</td>
<td>Bull. MED. Lib. Asso</td>
<td>UK</td>
<td>6</td>
<td>1.10</td>
<td>360</td>
<td>66.06</td>
</tr>
<tr>
<td>26</td>
<td>13</td>
<td>Malaysian Journal of Library &amp; Information Science</td>
<td>Malaysia</td>
<td>5</td>
<td>0.92</td>
<td>365</td>
<td>66.97</td>
</tr>
<tr>
<td>27</td>
<td>13</td>
<td>New Library World</td>
<td>UK</td>
<td>5</td>
<td>0.92</td>
<td>370</td>
<td>67.89</td>
</tr>
<tr>
<td>28</td>
<td>13</td>
<td>The Journal of Academic Librarianship</td>
<td>Netherland</td>
<td>5</td>
<td>0.92</td>
<td>375</td>
<td>68.81</td>
</tr>
<tr>
<td>29</td>
<td>14</td>
<td>Herald of Library Science</td>
<td>India</td>
<td>4</td>
<td>0.73</td>
<td>379</td>
<td>69.54</td>
</tr>
<tr>
<td>30</td>
<td>14</td>
<td>Lib. Coll. Acq. And Tech. Serve</td>
<td>USA</td>
<td>4</td>
<td>0.73</td>
<td>383</td>
<td>70.28</td>
</tr>
<tr>
<td>31</td>
<td>14</td>
<td>Lib. Mgt</td>
<td>UK</td>
<td>4</td>
<td>0.73</td>
<td>387</td>
<td>71.01</td>
</tr>
</tbody>
</table>
5.3. Productivity of Cited Journals:

The productivity of Cited Journals is measured by grouping all the journal citations in four groups containing roughly the same number of citations. The productivity of cited journals in the field of Library and information science is presented in the table 5.8. It is observed from the table that 25% total citations are contributed by two journals in the first group. The average productivity of each journal in the first, second, third and fourth groups is 64.50, 14.00, 4.97 and 1.47 respectively. This marked difference confirms the decreasing productivity of individual journals in the ranked list.

Table - 5-8

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Percentage of Citations</th>
<th>No of Citations</th>
<th>No of Journals covered</th>
<th>Percentage of Journals</th>
<th>Average Productivity of Journals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0-25%</td>
<td>129</td>
<td>2</td>
<td>1.52</td>
<td>64.50</td>
</tr>
<tr>
<td>2</td>
<td>26-50%</td>
<td>140</td>
<td>10</td>
<td>7.58</td>
<td>14.00</td>
</tr>
<tr>
<td>3</td>
<td>51-75%</td>
<td>144</td>
<td>29</td>
<td>21.97</td>
<td>4.97</td>
</tr>
<tr>
<td>4</td>
<td>76-100%</td>
<td>132</td>
<td>90</td>
<td>68.18</td>
<td>1.47</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>545</td>
<td>132</td>
<td>100.00</td>
<td>4.13</td>
</tr>
</tbody>
</table>

5.4. Applicability of Bradford’s law of Scattering:

The verbal formulation of the Bradford’s law of scattering is also tested by dividing the total number of citations in each field into three zones. The basis for choosing the three zones is that the variation is found to be minimum among the number of citations in each zone. The number of zones having almost the same of citations is shown in below table 5.9
It is observed from the table that there are 5 journals, sharing 3.79 percent of total cited journals. The next zone is represented by 24 journals which share 18.18 percent of total cited journals and the last zone is represented by 103 journals which share 78.03 percent of total cited journals. Each zone has approximately one third of the total citations. Hence the journal distribution as per the Bradford’s law reveals the ratio as 5 : 24 : 103.

Data conforming to the verbal formulation should show a more or less a constant ratio with an input of journal titles increasing geometrically. It is observed from the above that the number of journal titles in each zone is not increasing geometrically. Hence it is concluded that the dispersion of journal titles in Library and Information science does not satisfy the verbal formulation of Bradford’s law of scattering.

Table 5-9

Bradford’s zones

<table>
<thead>
<tr>
<th>Zones</th>
<th>No of Citations</th>
<th>No of journals</th>
<th>Cumulative No citations</th>
<th>Cumulative Journals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>186</td>
<td>5</td>
<td>186</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>179</td>
<td>24</td>
<td>365</td>
<td>29</td>
</tr>
<tr>
<td>3</td>
<td>180</td>
<td>103</td>
<td>545</td>
<td>132</td>
</tr>
</tbody>
</table>

5.5. Obsolescence of Literature:

Obsolescence is a characteristic of scientific and technical nature. Studies of ageing of obsolescence of documents commonly assess the decline in the use of a representative set of documents over time. Such studies help the librarians in deciding the documents that are to be kept or discarded in order to maintain the need based collection in libraries. In order to compare the speed of decay in different subjects, half-life is used as a measure. Half-life refers to “the time during which one-half of the current active literature was published”.

5.5.1. Age-wise distribution of citations:

The age-wise distribution of citations to journals in Library and Information Science is presented in the table 5.10. It is observed from the table that a citation has been made in a journal which was published 33 years ago. The article which still evidenced interest after 33 years was published in 1979. About 85 percent of journal citations are 15 years old.
Table 5.10

Distribution of Citations by Age

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Age</th>
<th>Number of Citations</th>
<th>Cumulative Number</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>13</td>
<td>13</td>
<td>2.39</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>40</td>
<td>53</td>
<td>9.72</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>51</td>
<td>104</td>
<td>19.08</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>54</td>
<td>158</td>
<td>28.99</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>45</td>
<td>203</td>
<td>37.25</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>35</td>
<td>238</td>
<td>43.67</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
<td>46</td>
<td>284</td>
<td>52.11</td>
</tr>
<tr>
<td>8</td>
<td>7</td>
<td>42</td>
<td>326</td>
<td>59.82</td>
</tr>
<tr>
<td>9</td>
<td>8</td>
<td>29</td>
<td>355</td>
<td>65.14</td>
</tr>
<tr>
<td>10</td>
<td>9</td>
<td>17</td>
<td>372</td>
<td>68.26</td>
</tr>
<tr>
<td>11</td>
<td>10</td>
<td>28</td>
<td>400</td>
<td>73.39</td>
</tr>
<tr>
<td>12</td>
<td>11</td>
<td>19</td>
<td>419</td>
<td>76.88</td>
</tr>
<tr>
<td>13</td>
<td>12</td>
<td>21</td>
<td>440</td>
<td>80.73</td>
</tr>
<tr>
<td>14</td>
<td>13</td>
<td>9</td>
<td>449</td>
<td>82.39</td>
</tr>
<tr>
<td>15</td>
<td>14</td>
<td>5</td>
<td>454</td>
<td>83.30</td>
</tr>
<tr>
<td>16</td>
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<td>466</td>
<td>85.50</td>
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<td>17</td>
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<td>475</td>
<td>87.16</td>
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<tr>
<td>19</td>
<td>18</td>
<td>6</td>
<td>492</td>
<td>90.28</td>
</tr>
<tr>
<td>20</td>
<td>19</td>
<td>4</td>
<td>496</td>
<td>91.01</td>
</tr>
<tr>
<td>21</td>
<td>20</td>
<td>3</td>
<td>499</td>
<td>91.56</td>
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<tr>
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<td>3</td>
<td>502</td>
<td>92.11</td>
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<td>507</td>
<td>93.03</td>
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<td>23</td>
<td>4</td>
<td>511</td>
<td>93.76</td>
</tr>
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<td>24</td>
<td>2</td>
<td>513</td>
<td>94.13</td>
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<td>526</td>
<td>96.51</td>
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<td>4</td>
<td>530</td>
<td>97.25</td>
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<td>2</td>
<td>532</td>
<td>97.61</td>
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<td>534</td>
<td>97.98</td>
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<td>3</td>
<td>537</td>
<td>98.53</td>
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<td>3</td>
<td>540</td>
<td>99.08</td>
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<td>541</td>
<td>99.27</td>
</tr>
<tr>
<td>33</td>
<td>32</td>
<td>3</td>
<td>544</td>
<td>99.82</td>
</tr>
<tr>
<td>34</td>
<td>33</td>
<td>1</td>
<td>545</td>
<td>100.00</td>
</tr>
</tbody>
</table>
6. Finding and Conclusion:

This investigation brought out the following points:

i). The researchers used the different bibliographic form-wise distribution of articles cited by the researchers, 791 citations are cited by the researchers in 12 bibliographic forms. Highly cited articles in journal citations, i.e. 68.90% Next Electronic resources, articles cited 13.02% and the remaining are having a very low percentage.

ii). The researcher used 791 subject citations, highly cited subjects is in library and information science 736 articles 93.05%. The researcher cited not only Library science articles. He is cited Computer science 35 articles 4.42%, Social Science and Atmospheric Science each 3 articles each 0.38%, Virtual Environment, physics, Mobile Communication Internet Adoption and Economics each 2 articles each 0.25% and Management Studies Higher Education, Environmental Science and E-Business each 1 articles 0.13%.

iii). Regarding Language-wise distribution of articles, the researcher cited only two languages, Highly cited language is in English 98.74%. Chinese language articles cited only 1.26%.

iv). In the country-wise distribution of articles, the researcher cited 16 countries articles for his research in the USA (261) 33% of articles, UK (217) 27.43% of the articles, India (201) 25.41% Netherland (66) 8.34% and other remaining 12 countries article cited by the researchers is below 2%.

v). Multiple authors (2-6 authors) are the highest in number, comprising 55.23 percent of the total citations. Single-authored papers occupy second place with 44.77 percent.

vi). Average number of Authors per citation is the highest author/article ratio is 2.50 (during 2011-12), and the average author/article ratio for the period under the study is 1.92.

vii). In the Ranking of Journals, the Scientometric occupies the first rank with 13.58 percent, followed by journal of Annals of Library and Information Studies (10.09%), in the second rank SRELS Journal of Information Management (3.85%), Third rank Annals of Library Science and Documentation (3.49), fourth rank Library Review and Resources sharing and Information Networks both journals are (3.12%) in fifth rank and remaining all are below 3%.

viii). Productivity of cited journals is 25% percent. Total citations are contributed by two journals in the first group. The average productivity of each journal in the first, second, third and fourth groups is 64.50, 14.00, 4.97 and 1.47 respectively. This marked difference confirms the decreasing productivity of individual journals in the ranked list.

ix). Applicability of Bradford’s law of Scattering is 5 journals, sharing 3.79 percent of total cited journals. The next zone is represented by 24 journals which share 18.18 percent of total cited journals and the last zone is represented by 103 journals which share 78.03 percent of total cited journals. Each zone has approximately one third of the total citations. Hence the journal distribution as per the Bradford’s law reveals the ratio as 5:24:103.
x). Age-wise distribution of citations is observed from the table that a citation has been made in a journal which was published 33 years ago. The article which still evidenced interest after 33 years was published in 1979. About 85 percent of journal citations are 15 years old.

References:

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• Osareh Farideh. ”Bibliometrics, Citation Analysis and Co - Citation Analysis: A Review of Literature.” Libri 46 (September 1996), p 149 - 158.
USE OF SOCIAL NETWORKING SITES BY THE SECONDARY AND HIGHER SECONDARY SCHOOL STUDENTS OF SRINAGAR, KASHMIR

Tawfeeq Nazir
Ph.D Research scholar
Department Library & Information Science
University of Kashmir
E-mail: Tawfeeq17@gmail.com

Abstract

From the very beginning, human beings always associated themselves to some form of social structure as they evolved across generations. Efforts to support social networks via computer-mediated communication were made in many early online services, including Usenet, ARPANET, LISTSERV, and bulletin board services (BBS). Technology innovations have always been perceived as either a boon or a curse to the mankind. Social Network can be also weighed in the same balance where it has many perceived beneficial aspects as compared to some adverse effects to the overall well being. The study investigates the use and purpose of accessing Social Networking sites (SNSs) by the students of Srinagar.

Key words: Social Networking Sites, Face book, chatting, education

Introduction

Internet is a very essential part of life from advertising and shopping to electronic mails and education. But today user of the internet has gone beyond its limits. Social media is the fastest growing web application in the 21st century. A social networking site is an online place where a user can create a profile and build a personal network that connects him or her to other users. In the past five years, such sites have rocketed from a niche activity into a phenomenon that engages tens of millions of internet users. Abbreviated as SNS a social networking site according to Webopedia, it is the phrase used to describe any Web site that enables users to create public profiles within that Web site and form relationships with other users of the same Web site who access their profile. In other words we can say that Social Network is social structure made up of individuals (or organizations) called “nodes”, which are tied (connected) by one or more specific types of interdependency, such as friendship, kinship, common interest, financial exchange, likes/dislikes, or relationships of beliefs, knowledge or prestige.

The growth in the popularity of these sites has generated concerns among some parents, school officials, and government leaders about the potential risks posed to young people when personal information is made available in such a public setting. Students are considered
as the social capital/asset for a nation, and the type of social capital a nation possesses is heavily dependent upon the youths of a nation. Information and communication technologies (ICTs) are becoming important tools for educational support. Al-Tarawneh (2014) Using computers and the Internet is becoming more and more important in the learning and teaching Processes. Also, with the advent of mobile phones, especially smart phones, it is becoming easier to reach students and even utilize the capabilities of technology.

Top 5 Social Networking Sites used In India (Alexa, 2013) are:

1. Face book
2. Linked in
3. Twitter
4. Pinterest
5. Instagram

Various educational institutes may have their presence on social networking sites focusing on their academia, academic and other extra-curricular activities, achievements and rewards, campus images etc. This would help the aspirants in knowing more about the particular institute. This present study will explore the influence of SNSs on the students’ performance and how they spend their time.

Problem

The growing popularity of Social Networking Sites (SNSs) for use in business, advertising, and recreation— and now for educational purposes—has become an international phenomenon. Today teenager shows very much interest for using social networks. The present study investigates the ways school students spend their time on SNSs and to ascertain the purpose and utility of using these social networking sites.

Objectives

The objectives of study are enumerated as:

1. To find out the use of different social networking sites by the students.
2. To know the popular social network website among students.
3. To find out the frequency of using these SNSs.
4. To explore the purpose and significance of using these online social networking sites.
5. To know the benefits and effects of the social networking sites to the student community.

REVIEW OF RELATED LITERATURE

A literature review is an account of what has been published on a topic by accredited scholars and researchers. The various scholarly articles reviewed related to the present study are:
Ahmed & Qazi (2011) found that majority of users (75.3%) were those who spend only 1-3 h a day on using SNSs, few were spending 4-6 h (19.5%) and small number of users (5.2%) was found to spend too much time on using these sites that is, 9 h or above. This reflects that majority of student users consume a reasonable time on these using these sites. The study also identifies the basic purpose of SNSs” usage among students and the findings clearly depict that about 73.5% respondents were using these sites to be in touch with their friends. Only 13.7% respondents use SNS for joining educational communities and the findings explicitly suggest that SNSs sites are basically used for non-academic motives. Ahmed & Qazi (2011) investigates s the impact of social networking sites (SNSs) on the studying habits of students and explored is that despite the use of social networking sites, students can balance their time between studies and their usage of these sites, and can sustain good studying habits to maintain their academic performance. Hence, usage of these networking tools does not adversely affect the studying habits of the students. (Conole, Galley and Culver ,2011) discusses the key challenges in researching new learning contexts through socially mediated environments, namely articulation and understanding of the nature of the interactions among users within these environments and between the users and the tools that form part of the environment. Hanson, et al (2011) findings revealed that health educators most commonly used social networking sites (34.8%), podcasts (23.5%), and media sharing sites (18.5%) within their organizations. Social influence (P < 0.0001) and performance expectancy (P < 0.0001) were both positively associated with increased behavioral intentions to use social media for health promotion. Reasons for lack of use included employers monitoring or blocking social media, difficulty of use among older health educators, and the belief that social media would not enhance job performance.

The study investigates the relationship between the use of SNSs and Chinese international students’ educational adaptation. Face book, as the most popular used in western young people, is perceived as the second choice for Chinese international students to build social networks. They use the SNSs as a way of keeping their existing social connections alive, rather than for making new friends (Cao & Zhang, 2012). Jain, et al (2012) they found that graduate students uses SNSs websites more instead of Post Graduate students. Out of 128 students 86% use one or more of the social networking sites: Facebook, Youtube, Twitter, Orkut, LinkedIn. The largest percentage of respondents used facebook (84.2%) followed by Youtube (82.5%), Twitter (22.3), Orkut (17.3%) and LinkedIn (4%). (Kindi and Alhashmi, 2012) The study found that the major reasons for frequent use of SNSs are finding information and sharing news. The study also indicated that lack of experience as well as insufficient time and IT skills are effective factors of not using SNSs. Oye & Ab.Rahim (2012) the study confirmed that most of the younger students are engage in the use of SNSs mainly for socializing activities rather than for academic purpose. However, most of the students do feel that the SNSs have more positive impact on their academic performance. Sezen (2012) ascertain that SNSs increases the student-student and teacher student interaction, enhancing student motivation and classroom climate, sharing materials with the instructor and students, making use of students’ interests and needs, and making learning process more interesting and permanent. Shambare, Rugimbanana and Sithole (2012) the study confirms the popularity of Facebook, and suggests potential for social networking in
many aspects of students’ lives including education. Faster Internet access and cheaper 3G technology, as well as Smartphone telephony, are enablers that influence adoption of social networking positively.

(Tariq, Mehboob, & Khan, 2012) The use of social networking sites exponentially increase there is no third party or any other community which could check for what actions are been performed by which user, so it is strongly recommended to check children’s activities on social networks and don’t let them use social networking websites.

Utpal (2012) found that the instant and widespread nature of social media spread it like a fire in the forest and Information sharing societies is based on the social promotion and practices of the exchanging and sharing knowledge originating from many different societies and help to evolve social revolution.

Social Networking Sites (SNSs) such as Facebook, Google+, Myspace, LinkedIn and Twitter have now become commonplace in international virtual space. Approximately 75% of all online adults maintain at least one social network profile (Weber, 2012). Huang and Capps (2013) investigates social networking sites (SNS) and ways college students spend their time on both conventional academic and recreational reading. A total of 1,265 (466 male and 799 female) college students voluntarily participated in the study by completing a self-report survey. Descriptive analysis indicated that the average amount of time students spent (M) on academic reading (AR), recreational reading (RR), and social networking (SN) was 7.72 hours, 4.24 hours, and 16.13 hours per week, respectively. Madhusudhan (2013) found that most respondents preferred the SNS Face book and Research Gate for academic purposes. Collaborative and peer-to-peer learning were common benefits from SNSs while some expressed concern regarding cyber-bullying and privacy. The majority of respondents finally said using SNSs may be a waste of time. (Pittenger, 2013) Social networking is feasible and can be used effectively within an overall strategy for inter professional education, but design and placement within a core content course is critical to success. Zhang (2013) investigates the college students' use of social networking sites, particularly Facebook, for health and wellness information. He found that users were skeptical about the quality of information, concerned about the lack of medical knowledge of their peers and wary about possible threats to their privacy and potential misuse of their health information. Embi, et al (2014) they revealed that a large majority of students were members of Facebook which they used on a daily basis mostly, but not exclusively to connect with their friends. The article concludes with opportunities to include such sites in formal and informal learning.

Scope

The scope of the study is limited to the regular students of secondary (9th & 10th) and Higher secondary (11th & 12th) classes of Srinagar Kashmir. The institute consists of 7 private schools and 7 government schools. The lists of schools are as under:

A. Private Schools include
Methodology

The 14 institutes (i.e. 7 government and 7 private schools) are selected by the lottery method of random sampling. In order to achieve above laid down objectives questionnaire tool is used to collect primary data from the students. Data are collected personally by visiting the selected institutes of the District Srinagar by distributed 400 questionnaires of which 200 questionnaires given to male students and 200 questionnaires given to female students randomly to the students of 9th, 10th, 11th & 12th classes who use SNSs. The distribution of questionnaires to different classes is shown in below Table.

<table>
<thead>
<tr>
<th>Class</th>
<th>Respondents</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>9th</td>
<td>8</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>10th</td>
<td>20</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>11th</td>
<td>156</td>
<td></td>
<td>148</td>
</tr>
<tr>
<td>12th</td>
<td>16</td>
<td></td>
<td>44</td>
</tr>
</tbody>
</table>

DATA ANALYSIS

1. Demographic information

The study selects randomly 400 students (200 each Male & Female) from secondary and higher secondary classes. The demography data shows different parameters of the study like the gender, age and class of the students. The vivid picture is offered by table 1.1, 1.2 and fig 1.
1.1 Number of Respondents

Table 1.1: Number of Respondents

<table>
<thead>
<tr>
<th>Gender</th>
<th>No of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>200</td>
</tr>
<tr>
<td>Female</td>
<td>200</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
</tr>
</tbody>
</table>

1.2 Age and Gender wise Number of Respondents

Table 1.2: Age wise number of respondents

<table>
<thead>
<tr>
<th>Age</th>
<th>Gender wise</th>
<th>No. of Respondents by Age group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MALE</td>
<td>FEMALE</td>
</tr>
<tr>
<td>14-16 years</td>
<td>32</td>
<td>16</td>
</tr>
<tr>
<td>16-18 years</td>
<td>148</td>
<td>160</td>
</tr>
<tr>
<td>18-20 years</td>
<td>20</td>
<td>24</td>
</tr>
<tr>
<td>&lt;20 years</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The analysis of data found that maximum no. of user fall under the age group of 16-18 years. The vivid picture is offered by fig. 1

![Fig1. Age & Genderwise Distribution of Respondents](image)
2. Type Of Social Networking Site Use

<table>
<thead>
<tr>
<th>Web site</th>
<th>Male</th>
<th>Female</th>
<th>Total use N=100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face book</td>
<td>180</td>
<td>148</td>
<td>328</td>
</tr>
<tr>
<td>Twitter</td>
<td>12</td>
<td>28</td>
<td>40</td>
</tr>
<tr>
<td>Linked in</td>
<td>0</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Pinterest</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Tumbler</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Instagram</td>
<td>8</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>VK</td>
<td>0</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Any other</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The study of data found that maximum number of students use face book (82%), followed by twitter (10%) and a very little number of students use instagram and linked in sites (3% and 2%). The results show that the students are very much familiar of face book than other social networking sites like instagram, pinterest and you tube. A clear picture is offered by fig.2.

![Type of Social Networking site Use](image-url)
3. Time Spent on the use of Social Networking sites

<table>
<thead>
<tr>
<th>Time</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Once a year</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>once a month</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>once a week</td>
<td>8</td>
<td>24</td>
</tr>
<tr>
<td>Less than 30 minutes</td>
<td>12</td>
<td>36</td>
</tr>
<tr>
<td>30-45 minutes</td>
<td>24</td>
<td>56</td>
</tr>
<tr>
<td>45-60 minutes</td>
<td>40</td>
<td>44</td>
</tr>
<tr>
<td>60-90 minutes</td>
<td>80</td>
<td>12</td>
</tr>
<tr>
<td>90-120 minutes</td>
<td>24</td>
<td>8</td>
</tr>
<tr>
<td>3 hours</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>3-5 hours</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>&lt; 5 hours</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The study found that majority of male students spent 60 to 90 minutes on the use of social networking sites while as most number of female students spent only 30 to 45 minutes on the use of social network sites. The reason may be that boys have more free time available and are not restricted as much as female students from the use of these tools. A vivid picture is offered by fig 3.
4. Media For Surfing Social Networking Sites

<table>
<thead>
<tr>
<th>Gadget</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile</td>
<td>112</td>
<td>128</td>
</tr>
<tr>
<td>Desktop</td>
<td>52</td>
<td>16</td>
</tr>
<tr>
<td>Laptop</td>
<td>32</td>
<td>56</td>
</tr>
<tr>
<td>Cybercafé</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>school computer Lab</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

From the study it is found that both male (56%) and female (64%) use their mobile devices for accessing the social networking sites followed by desktop and laptop devices as you seen from above table 4.

5. Purpose Of Using Social Networking Websites

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chatting</td>
<td>88</td>
<td>82</td>
</tr>
<tr>
<td>Information Sharing</td>
<td>52</td>
<td>54</td>
</tr>
<tr>
<td>Just For Fun</td>
<td>18</td>
<td>44</td>
</tr>
<tr>
<td>Making New Friends</td>
<td>42</td>
<td>20</td>
</tr>
</tbody>
</table>

Table 5 reveals that the main purpose of using SNSs are chatting: male students 88(44%) and female students 82 (41%) followed by information sharing: male students 52(26%) and female students 54(27%) ; making new friends: males 42(%) whiles as females make it use for fun 44(22%). The purposes of using SNSs are mostly recreation than educational.

6. Use Of Social Network Websites

<table>
<thead>
<tr>
<th>USE</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enjoying jokes</td>
<td>20</td>
<td>28</td>
</tr>
<tr>
<td>Sharing notices of the exam time tables, dates, and what teacher taught today and what fun did they do in the class</td>
<td>50</td>
<td>71</td>
</tr>
<tr>
<td>Wishing each other on birthday and other’s days like valentine day, friends day etc</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>Job information</td>
<td>22</td>
<td>14</td>
</tr>
<tr>
<td>Check news updates</td>
<td>73</td>
<td>51</td>
</tr>
<tr>
<td>Status uploads</td>
<td>14</td>
<td>22</td>
</tr>
<tr>
<td>Photo uploads</td>
<td>7</td>
<td>4</td>
</tr>
</tbody>
</table>
The study found that majority of students of both genders i.e. Male students 73(36.5%); 50(25%) and majority of Female students 51(25.5%); 71(35.5%) use SNSs for news updates and for Sharing notices of the exam time tables, dates, and what teacher taught them and what fun did they do in the class. The overall summary is offered by table 6.

7. Benefits Of Using Social Networking Sites

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Male N=50</th>
<th>Female N=50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve English communication skills</td>
<td>180</td>
<td>160</td>
</tr>
<tr>
<td>Decrease inferiority complex of talking and writing</td>
<td>155</td>
<td>130</td>
</tr>
<tr>
<td>Increase general knowledge and current Affairs</td>
<td>192</td>
<td>185</td>
</tr>
<tr>
<td>Provides a platform to make friendship with reputed and elite personalities who guide and motivate us</td>
<td>140</td>
<td>120</td>
</tr>
</tbody>
</table>

The table 7 clears shows that majority of students of both genders agree that SNSs are the platform to improve their communication skills (male students 90% & female students 80%), and increasing the depth of general knowledge and current affairs (Male students 96% & female students 92.5%).

Findings and Conclusion

The major findings of the study are:

1. 77% of the students who use social networking sites are at the age group of 16-18 years.
2. Face book is popular SNSs among 82% of the students followed by Twitter (10%).
3. 40% of Male students spent 60-90 minutes on the SNSs while as 28% Female student spent 30-45 minutes on SNSs.
4. 56% Male students and 64% Female students access SNSs from their mobile devices.
5. 44% Male students and 41% Female students use SNSs for chatting purpose.
6. Most of Male and Female students gets new updates and information sharing like the exam time tables, dates, and what teacher taught them and what fun did they do in the class.
7. Majority of the students of both genders agree that the use of SNSs improves their English communication skills and increases their general knowledge and current affairs.
Social networking sites have great potential for educational use and it is found that by chatting using Face book, Twitters, and chatting online result in increase of the English communication. The inferiority complex of talking and writing in English is decreased. They are trying their best to write and speak English which results in better communication.

Social networking sites get updated with the news and other information which results in increasing the General Knowledge and current affairs which in result make a child ready for competitive examination. Theses social sites increases the links of the friendship with reputed person and famous personalities and scientists which on request guide and motivate these students.

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ICT RESOURCES AND SERVICES IN UNIVERSITY LIBRARIES

Lakshmikant Mishra
Ph.D. Research Scholar
Shri Venkateshwara University, Gajraula, Amroha, U.P.
Librarian
F.O.A., UP Technical University, Lucknow
and

Dr. Jyoti Mishra
Research Supervisor, SVU & Dy. Librarian,
Tagore Library, University of Lucknow, Lucknow

Abstract

ICT has long standing influence in almost all areas of human activity. It acts as a catalyst in all spheres of science and technology. ICT has become within a short time one of the basic building blocks of a modern society. The impact has been rather well-known in case of service activities such as banking, health, transportation, education and libraries. ICT is significant to the libraries to achieve its goals for management of information, effective services and extension of boundaries from the four-walls to the globe. They offer access to books in every possible form and format. You can visit them in real, but you can also visit them via internet. The advent of digital computer advances in telecommunication and audiovisual technologies has opened up new ways of collecting, organizing and disseminating scientific and technical information.

Keywords: India, University libraries, Information and communication technology (ICT).

1.0 INTRODUCTION

The availability of information at right time and in the right form is of utmost importance in the development of knowledge as well as in all the development activities. It has become very difficult to manage the information manually due to the explosive growth knowledge. ICT is significant to the libraries to achieve its goals for management of information, effective services and extension of boundaries from the four-walls to the globe. Information and communications technology have changed the academic library in a profound way. Computers and networked electronic resources had become an integral part of the academic library the past decade. Information and Communications Technology (ICT) have transformed Library and Information services globally. The Internet has provided universal access to information. Technological innovation has dramatically increased the rate of conversion of knowledge, information and data into electronic format. Developments in the software arena has generated powerful knowledge management software which has
transformed the way knowledge is organized, stored, accessed and retrieved (Tam & Robertson, 2002:2).

ICT has become within a short time one of the basic building blocks of a modern society. Many countries now regard understanding ICT and mastering its basic concepts as part of the core of education (UNESCO, 2002b). In Uganda, Government has established a fully-fledged ICT Ministry since 2006 to stress the importance of ICT in promoting economic growth and development. Academic libraries, mostly attached to universities and research institutions as centres of information services, have largely benefited by the rapid changes in technology. Emergence of internet as the largest repository of information and knowledge, changed role of library and information science professionals from intermediary to facilitator, new tools for dissemination of information and shift from physical to virtual services environment and extinction of some conventional information services and emergence of new and innovation web based.

ICT is a term used to describe a range of equipment (hardware: personal computers, scanners and digital cameras) and computer programs (software: database programs & multimedia programs), & the telecommunications infrastructures (phones, faxes, modems, video conferencing equipment and web cameras) that allow us to access, retrieve, store, organize, manipulate, present, send material and communicate locally, nationally & globally through digital media (Dunmill and Arslanagic, 2006).

1.1 ICT RESOURCES AND SERVICES IN INDIAN UNIVERSITY LIBRARIES

The development and availability of information and communication technologies (ICTs) in libraries have today not only increased and broadened the impact of information resources at their doorsteps, but also placed more emphasis on effective and efficient services. Their applications in libraries, commonly known as library automation, have indeed continued to ease & promote quick & timely access to and transfer of information resources that are found dispersed round the globe. The various services provided in the libraries are complimented by available facilities, some of which are technology driven. In modern library, technology application in the provision and performance of library services provided by libraries to patrons. The utilization of emerging technologies in recent times in libraries worldwide has proved beyond reasonable doubt, that a library, whatever its services can perform better when facilities are adequately provided to enhance access to the content of the library.

Chisenga (2004) quoted that ICT came about as a result of the digital convergence of computer technologies, telecommunication technologies and other media communication technologies. Some library users are adopting electronic habits, making increasing use of the new ICT including computers, the Internet, the Web, Intranet, Extranet and other technologies. As a result, library users are placing new demands on their libraries. They require access to the latest information, updated information resources and access to ICT facilities that they could use in their work (Islam and Islam, 2006: 814).
The following are some of the ICT facilities or resources that can be used for effective library operations and services:

- **BAR-CODING TECHNOLOGY:** A barcode reader (or barcode scanner) is an electronic device for reading printed barcodes. Using barcode equipments for circulation and stock verification is becoming more common, efficient and time saver.
- **BULLETIN BOARD SERVICES:** A Bulletin Board System, or BBS, is a computer system running software that allows users to connect and log in to the system using a terminal. Once logged in, a user can perform functions such as uploading and downloading software and data, reading news and bulletins, and exchanging messages with other users, either through electronic mail or in public message boards.
- **CAS & SDI SERVICES:** A selection of current-awareness services in the form of Table of contents' (TOC) alerts, List of new arrivals of journals and Books, Press Clippings, Research Digest, including Abstracting and Indexing Service have been started by the library. Selective Dissemination of Information refers to tools and resources used to keep a user informed of new resources on specified topics.
- **CHAT SERVICES:** Online chat may refer to any kind of communication over the Internet, which offers an instantaneous transmission of text-based messages from sender to receiver. In Libraries, it can be used for online reference service and real time consulting service. Online chat may address as well point-to-point communications as well as multicast communications from one sender to many receivers.
- **COMPUTER TECHNOLOGY:** The dramatic development in the information transmission process in every field of human endeavour has been made by the widespread use of computer technology. Computer can be referred to as the backbone, nucleus or hub of ICT application. In virtually all ICT applications, the computer is interfaced with other devices in order to function effectively.
- **DATABASE SERVICES:** A database is an organized collection of data for one or more purposes, usually in digital form. Libraries provide access to a variety of bibliographical databases and full-text resources that are typically organized to model relevant aspects of reality, in a way that supports processes requiring the information.
- **DOCUMENT SCANNING SERVICES:** Scanner is important equipment in modernization of library. It is useful for scanning text, image and content pages of books and providing great help for establishing digital and virtual library.
- **ELECTRONIC BOOKS:** The elements that are considered as importing for the use of E-books in an academic library are the Content, Software and Hardware Standards, Protocols, Digital Rights Management, Access, Archiving, privacy, market, pricing and features. Electronic books (e-Books) are one way to enhance the digital library with global 24-hours-a-day and 7-days-a-week access to authoritative information, and they enable users to quickly retrieve and access specific research material easily, quickly, and effectively.
● ELECTRONIC DOCUMENT DELIVERY SERVICES: At present, a document delivery service typically involves a combination of paper, digital and electronic media; document delivery is a "hybrid" medium. Libraries are implementing ICT-based interlibrary lending system using electronic networks to deliver copies of journal articles and other documents in digital format [mainly in Portable Document Format (PDF)] to library users' desktops.

● ELECTRONIC JOURNALS: Electronic journal may be defined broadly as any journal, magazine, newsletter or type of electronic serial publication which is available over the internet and can be accessed using different technologies such as World Wide Web, Gopher, ftp, telnet, e-mail or listserv. Many publishers who offer subscriptions to print journals, sometimes also offer subscription to the electronic version of the journal free of charge. Some of the publishers who are providing e-journals include Emerald Elsevier, Kluwer, Springer, Highwire, John Wiley, etc.

● ELECTRONIC MAIL (E-mail): This medium can also be used to send and receive mails. This is commonly and widely used with the internet facilities. E-mail is very useful for sending messages to and from remote areas with enhanced network. Further, it is also useful in various aspects of library environment. Thus, it may be stated that e-mail may play a significant role in information dissemination services.

● ELECTRONIC RESOURCES: The e-Resources on magnetic & optical media have a vast impact on the collections of university libraries. The commonly available electronic resources are accessed electronically through traditional medias like CDROMs, or through internet as electronic journal, online database databases, e-book, or in the form of OPACs, blogs, wikis, podcasts, etc.

● FAX (FACSIMILE TRANSMISSION/ TELE FAX): It is used in some academic libraries for document delivery and other scholarly communications. It is a method of converting an image into electronic signals that can be transmitted over a communication link and converted back into an image at the receiving end.

● INDEXING AND ABSTRACTING SERVICES: An indexing and abstracting service is a service that provides shortening or summarizing of documents and assigning of descriptors for referencing documents.

● INSTITUTIONAL REPOSITORIES: An institutional repository is an online archive for collecting, preserving, and disseminating digital copies of the intellectual output of an institution, particularly a research institution. For a university, this includes materials such as journal articles, both before (preprints) and after (post prints) undergoing peer review, as well as digital versions of theses and dissertations.

● INTERNET: As a source of serious subjects of the universe of knowledge, has become information super highway and opened the floodgates for scholarly communication. Internet is truncated version of internetworking, which refers to interconnecting two or more computer networks. Internet is described as a worldwide network of computer and people. It is an important tool for global on line services. The emergence of Internet offers very high bandwidth, which will widen the scope for information processing and dissemination as never before. Internet connects universities, colleges, schools and other educational institutions for information
sharing and exchange. Access to information through Internet has changed the total scenario of librarianship.

- **LIBRARY MANAGEMENT SOFTWARE PACKAGE**: Software consists of the step-by-step instructions that tell the computer what to do. In a University Library, the most common computer software used are library automation software, database management software, antivirus software and application software. Many software packages for various applications in the field of library & information services and management are CDS/ISIS, SOUL, LIBSYS, KOHA etc. used for automation purposes.

- **LIBRARY RETRIEVAL SYSTEMS**: This involves using Compact Disc Read Only Memory (CDROM) technological mechanism of acquisition of specialized CD-ROM databases in various courses such as sciences, law, technology, agriculture, social sciences, medicine, humanities etc. They are available commercially.

- **LIBRARY WEBSITE**: A library website provides a library with a website to offer its services and to tell its story to its community. In most of the library website online catalogue is included. A library web page or Universal Resource Locator (URL) facilitates single window access to various web enabled library services.

- **MICROGRAPHIC & REPROGRAPHIC TECHNOLOGY**: These technologies are still widely used technology in libraries globally. Most of the research libraries have reprographic machine and provide photocopies of any document on demand. Microform is a generic term for all information carriers which use microfilm or similar optical media (including study) for the high-density recording and storage of optically encoded information in the form of micro images of printed document, bit patterns or holograms.

- **NETWORKED ELECTRONIC INFORMATION RESOURCES**: Networked electronic information resources are new vision of information of the future. These are the mainstay and life blood of present day information centres. Libraries are providing their users with access to networked information resources, i.e. databases, electronic scholarly journals, encyclopaedias, public government information, etc, provided by various publishers or suppliers.

- **NETWORKING TECHNOLOGY**: The important function of network is to interconnect computers and other communication devices so that data can be transferred from one location to another instantly. Networks allow many users to share a common pathway and communicate with each other. The networks include the local area network (LAN) in library housekeeping and resource sharing and wide area network (WAN) that covers wide geographic area such as a country or state, that covers limited geographic area such as campus, or building e.g. - DELNET, INDONET, INFLIBNET, MALIBNET, NICNET, ADINET etc are major WAN in India.

- **NPTEL SERVICES**: NPTEL provides E-learning through online Web and Video courses in Engineering, Science and humanities streams. The mission of NPTEL is to enhance the quality of engineering education in the country by providing free online courseware.
ONLINE FULL TEXT SERVICE: A full-text database is a compilation of documents or other information in the form of a database in which the complete text of each referenced document is available for online viewing, printing, or downloading.

ONLINE INSTRUCTIONS: Libraries are also implementing online based bibliographic or library use programs. These include online tutorials on searching online resources and virtual tours of library collections.

ONLINE PUBLIC ACCESS CATALOGUE (OPAC): It is the computer form of library catalogue to access materials in the library. It is an online database of materials held by a library or group of libraries. It is a computerized library catalog available to the public. Most OPACs are accessible over the Internet to users all over the world.

ONLINE READERS’ ADVISORY SERVICES: Libraries are implementing Web-based versions of readers’ advisory services and reference services. It helps to find the right information/reading material for the right person at the right time and provide the best information that matches their needs, interests, and reading level.

OPEN SOURCE SOFTWARE: Open Source Software or the OSS is freely available computer software, which allows altering the source code and customizing the software to anyone & for any purpose. In the last few years we have seen the development of a number of ILS products in the open source world such as Integrated Library Systems (ILSs) like Koha; Digital library software, like Greenstone; Digital Repository Software, like DSpace; Content Management Software, like Moodle, etc.

PRINTING TECHNOLOGY: A printer is a device that converts computer output into printed images. There are a number of different kinds of printers used in library such as Dot Matrix Printers, Laser printer, Inkjet, Bubble-Jet, etc.

RFID TECHNOLOGY: RFID (Radio Frequency Identification) is the latest technology being used in modern libraries to prevent theft the library materials. Radio frequency identification is a term used for technologies utilizing radio waves for identifying individual items automatically. It is a fastest, easiest, most efficient way to track, locate & manage library materials and being used in the libraries for automatic check-in and check-out circulation process and also in stock management. It is an emerging, more effective, convenient, and cost efficient technology in library automation and security. RFID is used very similar to bar codes. Developments in RFID technology continue to yield larger memory capacities, wider reading ranges, and faster processing.

SMART CARD FOR MEMBER IDENTIFICATION: A Smart Card is a polyvinyl plastic card (like a regular credit card) with an embedded chip on which data is stored. Smart cards can provide identification, authentication, data storage and application processing. Smart card readers are used to read smart cards. It can store multi applications and can be used for services like electronic purse/ debit card/ credit card/ health/ insurance/ loyalty etc.

STORAGE TECHNOLOGY: Optical disc storage technology is the most recent computer technology to enter the library community. CD ROM developed in 1985.
has ability to represent various media such as text, graphics and animation, video clips and sound files into a digital environment. Digital video disk or digital versatile disk (DVD) is the next generation of CD. The main feature of DVD is the compression technology and storing data on multi layer sides, stores 17 GB data is currently the only credible true multimedia format.

- TELE TEXT SERVICES: Tele text is a television information retrieval service developed in the United Kingdom in the early 1970s. It offers a range of text-based information, typically including national, international and sporting news, weather and TV schedules. Teletext information is broadcast in the vertical blanking interval between image frames in a broadcast television signal.

- TELECONFERENCING: Teleconferencing is a generic term that denotes the combined use of telecommunications and electronic technologies as an alternative to in-person meetings.

- VIDEO CONFERENCING: Videoconferencing is a method of holding conferences by transmitting and data communication networks, so that participants can both see and hear each other. It is convenient and less expensive for conducting a conference between two or more participants situated at different remote locations.

- VIDEOTEXT SERVICES: Videotext is a newer technology, but as in the on-line information retrieval, the information is stored in computer files and accessed through a telecommunication link. Videotext is any system that provides interactive content and displays it on a visual device, typically using modems to send data in both directions.

- VOICE MAIL: also known as voice mail, voice message or voice bank is a computer based system that allows users and subscribers to exchange personal voice messages. Voice mail acts like a telephone machine that digitizes the incomings voice message and store for retrieval later. It is an alternative system of e-mail.

- WEB TECHNOLOGY: The World Wide Web was developed in 1989 by Tim Berners Lee and by 1995 web has expanded to global proportions. The World Wide Web (WWW) is a client server based, distributed hypertext, and multimedia information system on the Internet.

1.2 CONCLUSION

Information and communications technology (ICT) have brought unprecedented change and transformation to university library and information services. It has created an environment where rapid continuous change had become the norm. Gone are the days when the library’s collection was its pride and determined its value. ICT has reduced the library from its stature as custodian of our literary heritage to being a competitor among many others in the information society. The concept of the university library as a physical entity is being eroded by online access and the rise of virtual university libraries. Access has replaced ownership and the Internet has made remote access to databases possible 24 hours 7 days per week. The university library finds itself in a time of tremendous challenge but it is also a time of boundless opportunity to use ICT creatively to enhance service delivery to the user.
University librarians should through research and consultation with their users find ways to add value to the user’s information retrieval experience.  

Until a few years ago the automation of libraries was a great dream for many libraries in the third world. Now more and more libraries in developing countries are working with online and/or CD-ROM databases, the Internet and OPACs. Libraries can collaborate with each other more than before and can exchange information much more easily and faster. Internet usage has grown in the whole country, and at the university libraries students are able to use the Internet whenever they please.  

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RESEARCH PRODUCTIVITY OF DEGREE COLLEGE TEACHERS IN GOA UNIVERSITY: A STUDY

Dr. Jayaprakash  
Librarian, D M’s College of Arts, Science, Commerce, Management Science and Technology, Mapusa, Goa - 403 507  
e-mail: dmc.librarian@rediffmail.com  

And  

Dr. M. M. Bachalapur  
Librarian, Kalpataru Institute of Technology, Tiptur, Karnataka.  
Email: bachalapur@gmail.com

Abstract  
Research is one the most important activity in higher education. Universities and colleges are providing ample opportunity for the researcher to find out innovative ideas in the respective field. At the same time, it is required to measure the performance of research in the universities. In this paper, an attempt has been made to evaluate the faculty members involved in the research activity in the academic colleges of Goa University.

Keywords: Research, Higher Education, Research Productivity, Return on Investment

1. Introduction:  
Today, there is a constant need to measure and quantify activities performed at colleges and universities. Higher education institutions need to comply with government mandates, review programs and substantiate accreditation.

In India, government and private organizations are spending huge amount of time, money and resources on teaching, learning, research and development activities. Indian government spends an estimated 1% of its GDP on research and development. Most of the higher learning institutes, Research and Development institutes have no idea what they are getting by investing this money. Only a few higher learning institutions and Research & Development institutes measure some kind of return on investment in R&D.

Publication productivity is the measure of the relationship between the output of research and inputs. Evaluating the productivity of an institutional research and developmental activities, it highlights the contribution of the institution and the individuals engaged in research. It also provides some insights into the complex dynamics of research activity and enables policy
makers and administrators to provide adequate facilities and gauge the research activities in a proper direction. A well known productivity indicator is the number of publications produced by scientists, institutions, teachers or research groups.

Return on Investment in simple words is a quantitative measure expressed as a ratio of the value returned to the institution for each monetary unit invested in it. Typical outputs which can easily be measured to calculate Return On Investment include the number of:-

- Awards won by individual / institution.
- Books written
- Designs produced
- Patents registered
- Products designed
- Presentations made in conferences / symposiums / Seminars
- Papers published in national and international journals.
- Projects completed in a particular duration
- Research proposals written etc

Now a days, management of the institution in higher education is asking their administrators to demonstrate the productivity / usage of the infrastructure which they have procured and to prove that how the organization got the benefit on investing on these resources.

2. **Objectives of the Study:**

The following are the objectives of the study:-

- To know the contributions of the faculties towards the research.
- To know the workshops / conferences organized by the government colleges.
- To know the differences in the contributions of private aided and government colleges in research.
- To know the difference of Rural / Urban college research productivity.

3. **Scope and Limitations of the Study:**

The study attempts to highlight the research productivity / publication output in both government aided private colleges and government colleges affiliated to Goa University in a two year time during 2010-11 and 2011-12, and it is limited to publications of a national and international journals and conference/seminars only.

4. **Data Analysis and Interpretations:**

The data analyzed would help to enrich individual / institutional contribution and growth of research in the field of Arts, Science and Commerce.
Table – 1 Ownership wise and Area-wise Distribution of Colleges

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Colleges</th>
<th>Ownership</th>
<th>%age</th>
<th>Area</th>
<th>%age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Govt. College of Arts &amp; Commerce, Pernem</td>
<td>Govt.</td>
<td>5%</td>
<td>Rural</td>
<td>5%</td>
</tr>
<tr>
<td>2.</td>
<td>Shree Mallikarjun College of Arts &amp; Commerce, Canacona</td>
<td>Pvt Aided</td>
<td>5%</td>
<td>Rural</td>
<td>5%</td>
</tr>
<tr>
<td>3.</td>
<td>Fr. Agnel College of Arts &amp; Commerce, Pilar</td>
<td>Pvt Aided</td>
<td>5%</td>
<td>Rural</td>
<td>5%</td>
</tr>
<tr>
<td>4.</td>
<td>Zantye Brother’s Educational Foundation’s College of Commerce, Bicholim</td>
<td>Pvt Aided</td>
<td>5%</td>
<td>Rural</td>
<td>5%</td>
</tr>
<tr>
<td>5.</td>
<td>Rosary College of Arts &amp; Commerce, Navelim</td>
<td>Pvt Aided</td>
<td>5%</td>
<td>Rural</td>
<td>5%</td>
</tr>
<tr>
<td>6.</td>
<td>Govt. College of Arts, Science &amp; Commerce, Khandola</td>
<td>Govt.</td>
<td>5%</td>
<td>Rural</td>
<td>5%</td>
</tr>
<tr>
<td>7.</td>
<td>MES College of Arts &amp; Commerce, Zuarinagar</td>
<td>Pvt Aided</td>
<td>5%</td>
<td>Rural</td>
<td>5%</td>
</tr>
<tr>
<td>8.</td>
<td>GVM’s College of Commerce &amp; Economics, Ponda</td>
<td>Pvt Aided</td>
<td>5%</td>
<td>Rural</td>
<td>5%</td>
</tr>
<tr>
<td>9.</td>
<td>Carmel College for Women, Nuvem, Salcete</td>
<td>Pvt Aided</td>
<td>5%</td>
<td>Rural</td>
<td>5%</td>
</tr>
<tr>
<td>10.</td>
<td>Govt. College of Arts, Science &amp; Commerce, Quepem</td>
<td>Govt.</td>
<td>5%</td>
<td>Rural</td>
<td>5%</td>
</tr>
<tr>
<td>11.</td>
<td>PES College of Arts &amp; Science, Ponda</td>
<td>Pvt Aided</td>
<td>5%</td>
<td>Rural</td>
<td>5%</td>
</tr>
<tr>
<td>12.</td>
<td>DM’s College of Arts, Science and Commerce, Mapusa</td>
<td>Pvt Aided</td>
<td>5%</td>
<td>Rural</td>
<td>5%</td>
</tr>
<tr>
<td>13.</td>
<td>Saraswat Vidyalaya Society’s College of Commerce &amp; Management Studies, Mapusa</td>
<td>Pvt Aided</td>
<td>5%</td>
<td>Urban</td>
<td>5%</td>
</tr>
<tr>
<td>14.</td>
<td>CIS’s College of Arts &amp; Commerce, Cuncolim</td>
<td>Pvt Aided</td>
<td>5%</td>
<td>Urban</td>
<td>5%</td>
</tr>
<tr>
<td>15.</td>
<td>S.S.Dempo College of Commerce &amp; Economics, Altinho, Panaji</td>
<td>Pvt Aided</td>
<td>5%</td>
<td>Urban</td>
<td>5%</td>
</tr>
<tr>
<td>16.</td>
<td>Govt. College of Arts, Science &amp; Commerce, Sanquelim</td>
<td>Govt.</td>
<td>5%</td>
<td>Urban</td>
<td>5%</td>
</tr>
<tr>
<td>17.</td>
<td>Dhempe College of Arts &amp; Science, Miramar, Panaji</td>
<td>Pvt Aided</td>
<td>5%</td>
<td>Urban</td>
<td>5%</td>
</tr>
<tr>
<td>18.</td>
<td>Shree Damodar College of Commerce &amp; Economics, Margao</td>
<td>Pvt Aided</td>
<td>5%</td>
<td>Urban</td>
<td>5%</td>
</tr>
<tr>
<td>19.</td>
<td>Smt. Parvatibai Chowgule College of Arts &amp; Science, Margao</td>
<td>Pvt Aided</td>
<td>5%</td>
<td>Urban</td>
<td>5%</td>
</tr>
<tr>
<td>20.</td>
<td>St. Xavier's College of Arts &amp; Science, Mapusa</td>
<td>Pvt Aided</td>
<td>5%</td>
<td>Urban</td>
<td>5%</td>
</tr>
</tbody>
</table>

Table-1 depicts the ownership wise distribution of the degree colleges, 20 % are state government colleges, and 80 % are government aided private colleges available in Goa. According to discipline wise, 55 % of the institutions belong to Arts and Commerce Colleges, 15 % colleges are related to Arts & Science colleges, 20 % of the colleges belong to Arts, Science and Commerce colleges, each 5 % of the colleges are belong to Commerce...
and Management is covered in this study. Majority of the colleges are in the Commerce field, followed by Arts and Science field.

60% of these colleges are in the rural area and remaining 40% are in urban area. It shows that, in Goa majority of the colleges are in the rural areas.

![Pie Chart showing distribution of colleges by area]

**Fig 1:**

**Table 2: Year of Establishment of Colleges**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Colleges</th>
<th>Year of Establishment</th>
<th>% age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dhempe College of Arts &amp; Science, Miramar, Panaji</td>
<td>1962</td>
<td>5%</td>
</tr>
<tr>
<td>2.</td>
<td>Smt. Parvatibai Chowgule College of Arts &amp; Science, Margao</td>
<td>1962</td>
<td>5%</td>
</tr>
<tr>
<td>3.</td>
<td>St. Xavier’s College of Arts &amp; Science, Mapusa</td>
<td>1963</td>
<td>5%</td>
</tr>
<tr>
<td>4.</td>
<td>Carmel College for Women, Nuvem, Salcete</td>
<td>1964</td>
<td>5%</td>
</tr>
<tr>
<td>5.</td>
<td>S.S. Dempo College of Commerce &amp; Economics, Altinho, Panaji</td>
<td>1966</td>
<td>5%</td>
</tr>
<tr>
<td>6.</td>
<td>MES College of Arts &amp; Commerce, Zuarinagar</td>
<td>1972</td>
<td>5%</td>
</tr>
<tr>
<td>7.</td>
<td>Shree Damodar College of Commerce &amp; Economics, Margao</td>
<td>1973</td>
<td>5%</td>
</tr>
<tr>
<td>8.</td>
<td>DM’s College of Arts, Science and Commerce, Mapusa</td>
<td>1974</td>
<td>5%</td>
</tr>
<tr>
<td>9.</td>
<td>GVM’s College of Commerce &amp; Economics, Ponda</td>
<td>1986</td>
<td>5%</td>
</tr>
<tr>
<td>10.</td>
<td>PES College of Arts &amp; Science, Ponda</td>
<td>1986</td>
<td>5%</td>
</tr>
<tr>
<td>11.</td>
<td>CES’s College of Arts &amp; Commerce, Cuncolim</td>
<td>1987</td>
<td>5%</td>
</tr>
<tr>
<td>14.</td>
<td>Govt. College of Arts, Science &amp; Commerce, Quepem</td>
<td>1989</td>
<td>5%</td>
</tr>
<tr>
<td>15.</td>
<td>Rosary College of Arts &amp; Commerce, Navelim</td>
<td>1990</td>
<td>5%</td>
</tr>
<tr>
<td>16.</td>
<td>Saraswat Vidyalaya Society’s College of Commerce &amp; Management Studies, Mapusa</td>
<td>1991</td>
<td>5%</td>
</tr>
<tr>
<td>17.</td>
<td>Fr. Agnel College of Arts &amp; Commerce, Pilar</td>
<td>1991</td>
<td>5%</td>
</tr>
<tr>
<td>18.</td>
<td>Govt. College of Arts &amp; Commerce, Pernem</td>
<td>1993</td>
<td>5%</td>
</tr>
<tr>
<td>19.</td>
<td>Shree Mallikarjun College of Arts &amp; Commerce, Canacona</td>
<td>1993</td>
<td>5%</td>
</tr>
<tr>
<td>20.</td>
<td>Zantye Brother’s Educational Foundation’s College of Commerce, Bicholim</td>
<td>1994</td>
<td>5%</td>
</tr>
</tbody>
</table>
Table-2 shows that, establishment year of the colleges. During the year 1960 to 1969 there are 25 % private aided colleges were established, in the preceding year 1970 to 1979 only 15 % private colleges are opened with government aid. Each 30 % colleges are opened in the year 1980 to 1989 (three government aided private colleges and three government colleges) and 1990 to 1999 (five government aided private colleges and one Govt. College).

**Fig 2:**
Table – 3 Faculty Strength wise Distribution of Colleges

<table>
<thead>
<tr>
<th>Name of the Colleges</th>
<th>Discipline</th>
<th>Area</th>
<th>Faculty Strengths (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Govt. College of Arts &amp; Commerce, Pernem</td>
<td>A &amp; C</td>
<td>Rural</td>
<td>12 (1.6)</td>
</tr>
<tr>
<td>Shree Mallikarjun College of Arts &amp; Commerce, Canacona</td>
<td>A &amp; C</td>
<td>Rural</td>
<td>17(2.3)</td>
</tr>
<tr>
<td>Fr. Agnel College of Arts &amp; Commerce, Pilar</td>
<td>A &amp; C</td>
<td>Rural</td>
<td>18(2.5)</td>
</tr>
<tr>
<td>CES’s College of Arts &amp; Commerce, Cuncolim</td>
<td>A &amp; C</td>
<td>Urban</td>
<td>19(2.6)</td>
</tr>
<tr>
<td>S.S.Dempo College of Commerce &amp; Economics, Altinho, Panaji</td>
<td>A &amp; C</td>
<td>Urban</td>
<td>20(2.8)</td>
</tr>
<tr>
<td>Rosary College of Arts &amp; Commerce, Navelim</td>
<td>A &amp; C</td>
<td>Rural</td>
<td>27(3.8)</td>
</tr>
<tr>
<td>MES College of Arts &amp; Commerce, Zuarinagar</td>
<td>A &amp; C</td>
<td>Rural</td>
<td>31(4.3)</td>
</tr>
<tr>
<td>GVM’s College of Commerce &amp; Economics, Ponda</td>
<td>A &amp; C</td>
<td>Rural</td>
<td>37(5.2)</td>
</tr>
<tr>
<td>Dhempe College of Arts &amp; Science, Miramar, Panaji</td>
<td>A &amp; C</td>
<td>Urban</td>
<td>44(6.1)</td>
</tr>
<tr>
<td>PES College of Arts &amp; Science, Ponda</td>
<td>A &amp; C</td>
<td>Rural</td>
<td>48(6.7)</td>
</tr>
<tr>
<td>Shree Damodar College of Commerce &amp; Economics, Margao</td>
<td>A &amp; C</td>
<td>Urban</td>
<td>57(8)</td>
</tr>
<tr>
<td>Smt. Parvatibai Chowgule College of Arts &amp; Science, Margao</td>
<td>A &amp; S</td>
<td>Urban</td>
<td>62(8.7)</td>
</tr>
<tr>
<td>St. Xavier’s College of Arts &amp; Science, Mapusa</td>
<td>A &amp; S</td>
<td>Urban</td>
<td>82(11.5)</td>
</tr>
<tr>
<td>Govt. College of Arts, Science &amp; Commerce, Khandola</td>
<td>ASC</td>
<td>Rural</td>
<td>28(3.9)</td>
</tr>
<tr>
<td>Govt. College of Arts, Science &amp; Commerce, Sanquelim</td>
<td>ASC</td>
<td>Urban</td>
<td>36(5)</td>
</tr>
<tr>
<td>Carmel College for Women, Nuvem, Salcete</td>
<td>ASC</td>
<td>Rural</td>
<td>38(5.3)</td>
</tr>
<tr>
<td>Govt. College of Arts, Science &amp; Commerce, Quepem</td>
<td>ASC</td>
<td>Rural</td>
<td>39(5.4)</td>
</tr>
<tr>
<td>DM’s College of Arts, Science and Commerce, Mapusa</td>
<td>ASC</td>
<td>Rural</td>
<td>57(8)</td>
</tr>
<tr>
<td>Zantye Brother’s Educational Foundation’s College of Commerce, Bicholim</td>
<td>C</td>
<td>Rural</td>
<td>24(3.3)</td>
</tr>
<tr>
<td>Saraswat Vidyalaya Society’s College of Commerce &amp; Management Studies, Mapusa</td>
<td>C &amp; M</td>
<td>Urban</td>
<td>14(1.9)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>710(100)</strong></td>
</tr>
</tbody>
</table>
Table-3 indicates the faculty strength in academic degree colleges, teaching staff are the main pillars of any educational institutions, St. Xavier College of Arts & Science, situated at Mapusa in North Goa District is having highest faculty strength i.e. 11% of the total faculty strength of the degree colleges, which is one of the oldest colleges established in the year 1963, followed by 8.7 % of the faculty strength is in Smt. Parvatibai Chowgule College of Arts and Commerce. It is also the oldest college established in the year 1962 and situated at Margao in South Goa District. Govt. College of Arts and Commerce Pernem and Saraswath College of Commerce and Management Studies is having least faculty strength i.e.: -1.6 and 1.9 % respectively. Average 35 numbers of faculties are working in these 20 degree colleges.

![Bar chart showing the distribution of faculties among different disciplines.]

**Fig 3:**

If we see, discipline wise teaching staff strength then, Arts and Commerce colleges are having 46 % of the total faculties followed by 28% faculties are in Arts, Science and Commerce colleges, 20% faculties belonged to Arts and Science colleges, only 5% college staffs are working in Commerce and Management colleges.

**Table-4 No. of Conferences / Workshops Organized By the Colleges**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Colleges</th>
<th>2010-11</th>
<th>2011-12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total No. of Conference/ workshps Organised</td>
<td>No. of Publications</td>
<td>Total No. of Conference/ workshps Organised</td>
</tr>
<tr>
<td></td>
<td>Pub</td>
<td>Bks</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Carmel College for Women, Nuvem, Salcete</td>
<td>4 (3.9)</td>
<td>5 (8.7)</td>
</tr>
<tr>
<td></td>
<td>2.</td>
<td>CES’s College of Arts &amp; Commerce, Cuncolim</td>
<td>1 (0.9)</td>
</tr>
<tr>
<td></td>
<td>3.</td>
<td>Dhempe College of Arts &amp; Science, Miramar, Panaji</td>
<td>8(7.8)</td>
</tr>
<tr>
<td></td>
<td>4.</td>
<td>DM’s College of Arts, Science and Commerce, Mapusa</td>
<td>2 (1.9)</td>
</tr>
<tr>
<td>5.</td>
<td>Fr. Agnel College of Arts &amp; Commerce, Pilar</td>
<td>3 (2.9)</td>
<td>5 (8.7)</td>
</tr>
</tbody>
</table>
The emphasis on research productivity is the faculty incentive and reward system is often justified by the claim that research enhances teaching. Educational research must be strengthened as an instrument for improving educational quality, and the results of such research should be communicated to teachers in a better way through Conferences, Seminars and Workshops. Table 4 informs us that, 21% of the conference/workshops are organized by the St. Xavier College of Arts and Science, followed by 12% of the workshops/conferences are organized in the Rosary College of Arts and Commerce and 10% by the

<table>
<thead>
<tr>
<th></th>
<th>Institution</th>
<th>Conference (1)</th>
<th>Workshops (2)</th>
<th>Conferences (3)</th>
<th>Workshops (4)</th>
<th>Conferences (5)</th>
<th>Workshops (6)</th>
<th>Total (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Govt. College of Arts &amp; Commerce, Pernem</td>
<td>1 (0.9)</td>
<td>2 (3.5)</td>
<td>6 (18.1)</td>
<td>3 (2.8)</td>
<td>3 (2.9)</td>
<td>2 (6)</td>
<td>102</td>
</tr>
<tr>
<td>7</td>
<td>Govt. College of Arts, Science &amp; Commerce, Khandola</td>
<td>2 (1.9)</td>
<td>5 (8.7)</td>
<td>5 (15.1)</td>
<td>4 (12.1)</td>
<td>4 (3.8)</td>
<td>3 (2.9)</td>
<td>57</td>
</tr>
<tr>
<td>8</td>
<td>Govt. College of Arts, Science &amp; Commerce, Quepem</td>
<td>2 (1.9)</td>
<td>-</td>
<td>4 (12.1)</td>
<td>4 (3.8)</td>
<td>3 (2.9)</td>
<td>2 (6)</td>
<td>33</td>
</tr>
<tr>
<td>9</td>
<td>Govt. College of Arts, Science &amp; Commerce, Sanquelim</td>
<td>10 (9.8)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3 (2.9)</td>
<td>-</td>
<td>105</td>
</tr>
<tr>
<td>10</td>
<td>GVM’s College of Commerce &amp; Economics, Ponda</td>
<td>5 (4.9)</td>
<td>-</td>
<td>-</td>
<td>1 (0.9)</td>
<td>-</td>
<td>-</td>
<td>25</td>
</tr>
<tr>
<td>11</td>
<td>MES College of Arts &amp; Commerce, Zuarinagar</td>
<td>4 (3.9)</td>
<td>-</td>
<td>-</td>
<td>7 (6.6)</td>
<td>-</td>
<td>-</td>
<td>12</td>
</tr>
<tr>
<td>12</td>
<td>PES College of Arts &amp; Science, Ponda</td>
<td>1 (0.9)</td>
<td>4 (7)</td>
<td>2 (6)</td>
<td>-</td>
<td>3 (2.9)</td>
<td>-</td>
<td>21</td>
</tr>
<tr>
<td>13</td>
<td>Rosary College of Arts &amp; Commerce, Navelim</td>
<td>12 (11.7)</td>
<td>3 (5.2)</td>
<td>-</td>
<td>12 (11.4)</td>
<td>1 (0.9)</td>
<td>1 (3)</td>
<td>102</td>
</tr>
<tr>
<td>14</td>
<td>S.S.Dempo College of Commerce &amp; Economics, Altinho, Panaji</td>
<td>-</td>
<td>10 (17.5)</td>
<td>6 (18.1)</td>
<td>-</td>
<td>5 (4.9)</td>
<td>-</td>
<td>22</td>
</tr>
<tr>
<td>15</td>
<td>Saraswat Vidyalaya Society’s College of Commerce &amp; Management Studies, Mapusa</td>
<td>4 (3.9)</td>
<td>-</td>
<td>-</td>
<td>3 (2.8)</td>
<td>-</td>
<td>-</td>
<td>24</td>
</tr>
<tr>
<td>16</td>
<td>Shree Damodar College of Commerce &amp; Economics, Margao</td>
<td>3 (2.9)</td>
<td>1 (1.7)</td>
<td>-</td>
<td>6 (5.7)</td>
<td>16 (15.8)</td>
<td>-</td>
<td>33</td>
</tr>
<tr>
<td>17</td>
<td>Shree Mallikarjun College of Arts &amp; Commerce, Canacona</td>
<td>5 (4.9)</td>
<td>-</td>
<td>3 (2.8)</td>
<td>-</td>
<td>1 (3)</td>
<td>-</td>
<td>105</td>
</tr>
<tr>
<td>18</td>
<td>Smt. Parvatibai Chowgule College of Arts &amp; Science, Margao</td>
<td>9 (8.8)</td>
<td>6 (10.5)</td>
<td>2 (6)</td>
<td>11 (10.4)</td>
<td>16 (15.8)</td>
<td>3 (9)</td>
<td>105</td>
</tr>
<tr>
<td>19</td>
<td>St. Xavier’s College of Arts &amp; Science, Mapusa</td>
<td>22 (21.5)</td>
<td>-</td>
<td>24 (22.8)</td>
<td>19 (18.8)</td>
<td>21 (63.6)</td>
<td>-</td>
<td>105</td>
</tr>
<tr>
<td>20</td>
<td>Zantye Brother’s Educational Foundation’s College of Commerce, Bicholim</td>
<td>4 (3.9)</td>
<td>-</td>
<td>6 (5.7)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>25</td>
</tr>
</tbody>
</table>

The emphasis on research productivity is the faculty incentive and reward system is often justified by the claim that research enhances teaching. Educational research must be strengthened as an instrument for improving educational quality, and the results of such research should be communicated to teachers in a better way through Conferences, Seminars and Workshops. Table 4 informs us that, 21% of the conference/workshops are organized by the St. Xavier College of Arts and Science, followed by 12% of the workshops/conferences are organized in the Rosary College of Arts and Commerce and 10% by the
Govt. College of Arts, Science and Commerce, Sanquelim during the year 2010-11. It shows that, 85 % of the workshops/conferences are organized by the private aided colleges and remaining 15 % of the workshops/conferences are organized by the Government colleges. Private aided colleges are very active in organizing conferences and workshops in their field of study. It is interesting to note that, Colleges located in urban areas are conducted 56 % of the workshops/seminars/conferences whereas; colleges located in rural areas conducted 44 % workshops/conferences.

Again during the year 2011-12, 23 % of the conference / workshops are organized by the St. Xavier College of Arts and Science, followed by 12 % of the workshops/ conferences are organized in the Rosary College of Arts and Commerce and 10 % of the workshops/conferences are organized by the Smt. Parvatibai Chowgule College of Arts & Science, Margao. It shows that, 93 % of the workshops/conferences are organized by the private aided colleges and remaining 7 % of the workshops/conferences are organized by the Government colleges. It is interesting to note that, Colleges located in urban areas have conducted 60 % of the workshops/seminars/conferences whereas; colleges located in rural areas have conducted 40 % workshops/conferences.

St. Xavier college of Arts & Science and Rosary College of Arts and Commerce both the colleges are organized /conducted highest number of conferences /workshops in the year 2010-2011 and 2011-2012. It is also noted from this table that, colleges located in urban areas have organized more number of conferences/workshops in both the years.

Table-5 No. of Publications produced in the Colleges

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Colleges</th>
<th>2010-11</th>
<th>2011-12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No. of Publications</td>
<td>No. of Publications</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pub</td>
<td>Bks</td>
</tr>
<tr>
<td>1.</td>
<td>GVM’s College of Commerce &amp; Economics, Ponda</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2.</td>
<td>MES College of Arts &amp; Commerce, Zuarinaragar</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3.</td>
<td>Saraswat Vidyalaya Society’s College of Commerce &amp; Management Studies, Mapusa</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4.</td>
<td>Zantye Brother’s Educational Foundation’s College of Commerce, Bicholim</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5.</td>
<td>Carmel College for Women, Nuvem, Salcete</td>
<td>5 (8.7)</td>
<td>5 (15.1)</td>
</tr>
<tr>
<td>6.</td>
<td>CES’s College of Arts &amp; Commerce, Cuncolim</td>
<td>3 (5.2)</td>
<td>2 (6)</td>
</tr>
<tr>
<td>7.</td>
<td>S.S. Dempo College of Commerce &amp; Economics, Altinho, Panaji</td>
<td>10 (17.5)</td>
<td>6 (18.1)</td>
</tr>
<tr>
<td>8.</td>
<td>Fr. Agnel College of Arts &amp; Commerce, Pilar</td>
<td>5 (8.7)</td>
<td>-</td>
</tr>
<tr>
<td>9.</td>
<td>Govt. College of Arts, Science &amp; Commerce, Sanquelim</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10.</td>
<td>PES College of Arts &amp; Science, Ponda</td>
<td>4 (7)</td>
<td>2 (6)</td>
</tr>
</tbody>
</table>
11. Shree Damodar College of Commerce & Economics, Margao | 1 (1.7) | - | 16 (15.8) | -
12. DM’s College of Arts, Science and Commerce, Mapusa | 4 (7) | - | 16 (15.8) | -
13. St. Xavier’s College of Arts & Science, Mapusa | - | - | 19 (18.8) | 21 (63.6)
14. Smt. Parvatibai Chowgule College of Arts & Science, Margao | 6 (10.5) | 2 (6) | 16 (15.8) | 3 (9)
15. Govt. College of Arts, Science & Commerce, Khandola | 5 (8.7) | 5 (15.1) | 5 (4.9) | 2 (6)
16. Govt. College of Arts & Commerce, Pernem | 2 (3.5) | 6 (18.1) | 3 (2.9) | 2 (6)
17. Govt. College of Arts, Science & Commerce, Quepem | - | 4 (12.1) | 3 (2.9) | 2 (6)
18. Shree Mallikarjun College of Arts & Commerce, Canacona | - | - | - | 1 (3)
19. Dhempe College of Arts & Science, Miramar, Panaji | 9 (15.7) | 1 (3) | 10 (9.9) | 1 (3)
20. Rosary College of Arts & Commerce, Navelim | 3 (5.2) | - | 1 (0.9) | 1 (3)

<table>
<thead>
<tr>
<th>College</th>
<th>2010-2011</th>
<th>Publications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shree Damodar College</td>
<td>16 (15.8)</td>
<td></td>
</tr>
<tr>
<td>DM’s College of Arts</td>
<td>16 (15.8)</td>
<td></td>
</tr>
<tr>
<td>St. Xavier’s College of Arts</td>
<td>19 (18.8)</td>
<td></td>
</tr>
<tr>
<td>Smt. Parvatibai Chowgule College</td>
<td>16 (15.8)</td>
<td></td>
</tr>
<tr>
<td>Govt. College of Arts, Science &amp; Commerce, Khandola</td>
<td>5 (4.9)</td>
<td></td>
</tr>
<tr>
<td>Govt. College of Arts &amp; Commerce, Pernem</td>
<td>3 (2.9)</td>
<td></td>
</tr>
<tr>
<td>Govt. College of Arts, Science &amp; Commerce, Quepem</td>
<td>3 (2.9)</td>
<td></td>
</tr>
<tr>
<td>Shree Mallikarjun College, Canacona</td>
<td>1 (3)</td>
<td></td>
</tr>
<tr>
<td>Dhempe College of Arts &amp; Science, Miramar, Panaji</td>
<td>10 (9.9)</td>
<td></td>
</tr>
<tr>
<td>Rosary College of Arts &amp; Commerce, Navelim</td>
<td>1 (3)</td>
<td></td>
</tr>
</tbody>
</table>

**Fig 4: Publications for the year 2010-2011**
Fig 5: Publications for the year 2011-2012

Table – 6 depicts the number of publications made by these colleges, 40 % of the colleges does not produce any publications in the form of articles in journals and conference proceedings or in the form of chapters in books for the year 2010-11, 35 % of the colleges does not publish any articles in the conference proceedings or in the journals, whereas, 60 % of the colleges have not published their articles in the form of book chapters for the year 2011-12. In the year 2010-2011, rural area college teachers published 49 % of their publications in the conference proceedings/journals and 66 % in the form of book chapters. Urban area college teachers published 51 % of their publications in the conference proceedings/journals and 34 % in the form of book chapters. In the year 2011-12, rural area college teachers published 31 % of their publications in the conference proceedings/journals and 21 % in the form of book chapters. Urban area college teachers published 68 % of their publications in the conference proceedings/journals and 78 % in the form of book chapters.

If we rank these colleges according to publication wise then, S.S. Dempo College of Commerce & Economics, Altinho, Panaji produced 18 % of the publications in the form of books and journals during the year 2010-11 followed by Dhempe college of Arts and Science with 16 % and 3 % respectively in the form of journals and book form. Whereas, during the year 2011-12, St. Xavier College, Mapusa produced 19 % of the publications in journals/conference proceedings and 64 % in the book form, followed by Smt. Parvathibai Chowgule College of Arts and Science with 16 % and 9 % respectively in the form of journals/conference proceedings and in the book form.

5. Findings:

1. 20 % are state government colleges, and 80 % are of grant in aid private colleges available in the state of Goa.
2. 55 % of the institutions are belonged to Arts and Commerce Colleges.
3. 60 % of the colleges are opened during the year 1980 to 1999 (eight government aided private colleges and four government colleges).
4. Average 35 numbers of faculties are working in these 20 colleges. Arts and Commerce colleges are having 46 % of the total faculty.
5. Private aided colleges are very active in organizing conferences and workshops in their field of study during the year 2010-11 and 2011-12.
6. Colleges located in urban areas have organized more number of conferences/workshops in both the years.
7. 49 % publications in journals, conferences etc are from rural colleges and 51 % publications are from urban Goa, rural college teachers’ productivity is more compared to urban teachers in the year 2010-11.
8. 69 % of the publications are from urban college teachers.
9. 40 % of the colleges does not produce any publications in the form of articles in journals and conference proceedings or in the form of chapters in books for the year 2010-11, 35 % of the colleges does not published any articles in the conference proceedings.
proceedings or in the journals, whereas, 60% of the colleges are not published their articles in the form of book chapters for the year 2011-12.

10. Among these colleges, S.S. Dempo College of Commerce & Economics, Altinho, Panaji produced 18% of the publications in the form of books and journals during the year 2010-11. Whereas, during the year 2011-12, St. Xavier College, Mapusa produced 19% of the publications in journals/conference proceedings and 64% in the book form.

11. It is understood that, wherever the faculties are more, number of publications is also more.

6. **Suggestions and Recommendations:**

- It is suggested to implement promotions and other incentives based on their research productivity in their field of study.
- It is suggested Principals of the less productive colleges should give more importance to their teachers to encourage research in their institutions, as their research productivity is very less compared to the other institutions.
- Government college contribution towards organizing workshops / conferences is less compared to government aided private colleges, so it is suggested to government colleges to organize more number of research oriented conference / workshops in their colleges and provide an opportunity to local teachers to publish their research work in the national / international level conferences.
- It is suggested to maximize the use of library resources especially electronic resources of N-List from INFLIBNET.
- It is suggested to give free reprographic facility and internet facility to the teachers for writing/publishing more number of articles in the national and international level publications.

7. **Conclusion:**

It is important to measure performance at least annually, to evaluate the effect of specific actions on long-term results and on the organization’s vision and mission. The institutions should measure current performance against previously set expectations, and consider any changes or events that may have impacted the desired course of actions.

Research publications are clearly one of the quantitative measures of the basic research activity in a country or an institution. The institution, which generates a good number of the research papers in a particular field, is considered as a frontier institution in that field. Such studies help decision makers and policy planners in the respective field to make available adequate facilities and direct the research activities in the proper direction. The recent innovation programmes of the DST such as INSPIRE, JC Bose Professorships, should prove helpful in increasing the number and quality of R&D personnel.

In Goa, Government aided private colleges are more when compared to government colleges. In the St. Xavier College publications are more compared to other college publications, the
reason may be faculties are more in that college, so ultimately they get more time for research work in their field of study and it is also the oldest college in Goa. Since forty % of the colleges are not able to publish any research papers, may be because of lack of time and interest of the teachers in research activity and other physical facility.

Many higher learning institutions are now putting pressure on their teaching staff and others not only to produce new products, processes and services, but to demonstrate their value to the organization. R&D measurement and evaluation systems are no longer an optional choice but soon becoming a mandatory requirement. Recently in the year 2010 UGC introduced the Academic Performance Indicators for its University / College teachers for the Promotion of their teaching staff. It is mandatory to get minimum marks by publishing research articles to get next career advancement / promotion.

References:

E-RESOURCES IN UGC-INFONET DIGITAL LIBRARY CONSORTIUM: A PROFILE

Prabhakar Komrelli
Research Scholar
Dept. of Library & Inf. Science, Rayalaseema University
Kurnool- 518002, A.P., INDIA.
Email: prabhu.lib2007@gmail.com

Abstract

This paper explain the terms and definitions of Electronic Resources (E-resource), in UGC Infonet Digital Library Consortium followed by the aims and objectives of the E-resources. The e-subscription initiative under UGC-INFONET is expected to trigger remarkable increase in sharing of both print and electronic resources amongst university libraries through one of the gateway portal being identified. The objective of e-resources is to provide the University community E-access to research journals, and abstracting and review publications and databases. It covers all areas of learning, science and technology, social sciences and humanities. The gateway portals play a very important role for providing access full text of the journals.

Keywords: E-resources, UGC-Infonet, Digital Library Consortium

1. Introduction

Cooperation amongst institutions for sharing their library resources is being practiced for decades. Traditionally, the primary purpose of establishing a library consortium is to share physical resources including books and periodicals amongst members. However, the mode of cooperation has gone under a transformation with infusion of new information technology from print-based environment to digital environment. The emergence of Internet, particularly, the World Wide Web (WWW) as a new media of information delivery triggered proliferation of Web-based full-text online resources. Increasing number of publishers are using the Internet as a global way to offer their publications to the international community of scientists. The technology provides an unparalleled media for delivery of information with greater speed and economy. The libraries and information centres, as heavy consumers of electronic journals and online databases, stand to benefit greatly from this technology-driven revolution. The availability of IT-based electronic information products are exerting ever-increasing pressure on libraries, which, in turn, are committing larger portions of their budgetary allocation for either procuring or accessing web-based online full-text search services, CD ROM products and online databases. The libraries with their diminishing or at the best static financial allocations have to consider new ways to consolidate global resources amongst them in order to maximize their limited financial resources. The combination of
these developments has resulted in the development of “shared subscription” or “consortia-based subscription” to journals everywhere in the world.

Shared subscription or consortia-based subscription to electronic resources through the consortia of libraries, on one hand, permits successful deployment and desktop access to electronic resources at a highly discounted rates of subscription and on the other hand, it meets with the increasing pressures of diminishing budget, increased user’s demand and rising cost of journals. The library consortia, on the basis of sheer strength of the number of institutions, offer healthy business growth opportunities to the electronic publishers and thus attract the best possible price and terms of agreements. With this welcome change, the libraries all over the world are forming consortia of all types and at all levels with an objective to take advantage of current global network to promote better, faster and more cost-effective ways of providing electronic information resources to the information seekers. GALILIO, OhioLink, TexShare, VIVA and SUNYConnect in USA, CALIS in China, CONCERT in Taiwan, INDEST-AICTE Consortium, UGC-INFONET Digital Library Consortium and CSIR E-Journals Consortium in India are some of the well-known library consortia. Besides, library consortia that emerged with primary motive to license e-resources for their member institutions, several existing library networks have also taken-up the task to license e-resources for their members.

Considering the facts mentioned above, the University Grants Commission launched two ambitious programmes for the academic community in universities under its purview. The first initiative, namely “UGC-Infonet Connectivity Programme” provides for networking of university campuses with state-of-the-art campus wide networks and Internet bandwidth, the second initiative called the “UGC-Infonet Digital Library Consortium” provides access to selected scholarly electronic journals and databases in different disciplines. The INFLIBNET is responsible for execution and monitoring of both the initiatives.

2. UGC Infonet Digital Library Consortium

The UGC INFONET Digital Library Consortium is major initiative of University Grants Commission (UGC) to bring qualitative change in academic libraries in India. It was formally launched in December, 2003 by Honorable Dr. A P J Abdul Kalam, the then President of India, soon after providing the Internet connectivity to the universities in the year 2003 under the UGC-Infonet programme. It is a national initiative for providing access to scholarly electronic resources including full-text and bibliographic databases in all subject disciplines to academic community in India. It facilitates access to high quality e-resources to academia in the country to improve teaching, learning and research. The Consortium provides current as well as archival access to nearly 9,000 core and peer-reviewed journals and five bibliographic databases in different disciplines from 42 publishers and aggregators. The access to all major e-resources was given 50 universities in first phase in the year 2004. It has now been extended to 193 universities in three different phases. In terms of number of users, the UGC-INFONET Digital Library Consortium is the largest Consortium in India.
with a vision and plan to reach out to all universities and colleges affiliated to these universities, over a period of time.

**History of UGC-Infonet**

The UGC-Infonet Digital Library Consortium was formally launched in December, 2003 by Honourable Dr. A P J Abdul Kalam, the President of India soon after providing the Internet connectivity to the universities in the year 2003 under the UGC-Infonet programme. The Consortium proved to be a recipe to university libraries which have been discontinuing subscription of scholarly journals because of "Serials Crisis". The term "serials crisis" refers to exponential and continuing increase in subscription cost of scholarly journals. The crisis is a result of rise in cost of journals much faster than the rate of inflation, increase in number of journals and the paucity of funds available to the libraries.

The Consortium provides current as well as archival access to more than 8500+ core and peer-reviewed journals and 5 bibliographic databases from 42 publishers and aggregators in different disciplines. The programme has been implemented in phased manner. In the first phase that began in 2004, access to e-resources was provided to 50 universities who had Internet connectivity under the UGC-Infonet Connectivity programme of the UGC. In the second phase, 50 more universities were added to the programme in the year 2005. So far 193 Universities including 14 National Law schools and central universities that come under the purview of UGC, have been provided differential access to subscribed e-resources. These e-resources covers almost all subject disciplines including arts, humanities, social sciences, physical sciences, chemical Sciences, life sciences, computer sciences, mathematics and statistics, etc. The programme is wholly funded by the UGC and executed by the INFLIBNET (Information and Library Network) Centre, Gandhinagar.

The benefit of subscription to e-resources would also be extended to the colleges, to begin with the College for Potential with Excellence (CPE) and autonomous colleges. The Consortium has also launched its "Associate Membership Programme" wherein private universities and other research organizations are welcomed to join the Consortium for selected e-resources.

**3. Aims and Objectives**

The main objective of the UGC INFONET Digital Library Consortium is to provide access to qualitative electronic resources including full-text and bibliographic databases to academic institutions at a lower rates of subscription. The major aims and objectives of the UGC-Infonet Digital Library Consortium are as follows:

- To provide access to a high-quality and scholarly electronic resources to a large number of academic institutions including universities and colleges at substantially lower rates of subscription and at most favourable terms and conditions.
To promote rapid and efficient access to scholarly content to the users and to create and promote use of ICT in teaching and learning in universities in India.

To extend the benefit of Consortium to its associate members including private universities and colleges.

To impart training to the users, librarians, research scholars and faculty members of the institutions in use of electronic resources with an aim to optimize their usage.

To promote use of e-resources with gradual decrease in print subscription.

To promote interaction and inter-library cooperation amongst the participating universities.

To evaluate the usage of the subscribed resources and to identify new resources that are required to be subscribed under the programme.

To bring qualitative change in teaching, learning and research with an aim to meet the ever growing challenges of globalization of higher education.

To increase the research productivity of the institutions both in terms of quality and quantity of publications.

4. Benefits

The consortia-based subscription to e-resources is a viable solution for increasing the access to electronic resources across institutions at a lower rate of subscription. Major benefits of UGC-INFONET Digital Library Consortium are as follows:

i). The Consortium acts as a single-window service for a large number of universities with their diverse research and academic interest.

ii). The Consortium, with its collective strength of participating institutions, attracts highly discounted rates of subscription with most favourable terms of agreement for a wider range of e-resources. Most of the e-publishers have responded positively to the call of the Consortium. The rates offered to the consortium are lower by 60% to 99% depending upon the category of institutions.

iii). Users have immediate access to material previously not subscribed to, at no incremental cost for accessing back files.

iv). It improves the existing library services and reduce the subscription cost.

v). The research productivity of beneficiary institutions is expected to improve with increased access to international databases and full-text resources.

vi). The Consortium is expected to trigger remarkable increase in sharing of both print and electronic resources amongst participating library through J-GATE Custom Contents for Consortia (JCCC).

vii). The Consortium has been opened-up for all other universities / educational institutions through its “Associate Membership Programme”. Private universities and other institutions can join the Consortium and get the benefit of not only highly discounted rates of subscription but also the favourable terms and conditions.
viii). Members of the Consortium have the benefit of cap on the annual increase in the rates of subscription. While the usual increase in price of e-resources vary from 15 to 20%, the consortium enjoys the cap on increase in price ranging from 5% to 8%.

ix). The Consortium is offered better terms of agreement for use, archival access and preservation of subscribed electronic resources, which would not have been possible for any single institutions.

x). Since the subscribed resources is accessible online in electronic format, the beneficiary institutions have less pressure on space requirement for storing and managing print-based library resources. Moreover, all problems associated with print media such as their wear and tear, location, shelving, binding, organizing, etc. are not an issue for electronic resources.

5. E- Resources

The Consortium subscribes to electronic resources covering all major subject discipline being taught in universities. It includes wide variety of materials e.g. e-journals, bibliographic databases, reviews published by scholarly societies, university presses, institutional and commercial publishers. The Consortium subscribes to 29 full-text e-resources and 5 bibliographic databases from 24 publishers and aggregators. The member institutions are provided differential access to these resources based on their needs and activity profile as per the recommendation of the National Steering Committee.

The resources subscribed by the Consortium can broadly be divided into the following Two categories:

i) Full-text E- Resources

Full-text electronic resources contain complete articles along with their bibliographic details. The consortium subscribes to full-text e-resources from scholarly societies, university presses, commercial publishers and aggregators including American Chemical Society, American Institute of Physics, Oxford University Press, Cambridge University Press, Cell Press, Springer Link, Jstor, Project Muse, etc. All full-text resources subscribed by the Consortium contain electronic journals.

ii) Bibliographic Databases

Bibliographic databases contain references to articles published in journals, conference proceedings or chapters in books. Most bibliographic databases contain abstracts of the articles along with links to their full-text. A list of full-text resources and bibliographic databases subscribed under the Consortium.

5.1. Resources Selection
The print collection base available in university libraries and their requirements was surveyed with an aim to identify and determine e-resources to be subscribed under the UGC-INFLONET Digital Library Consortium. In order to understand the collection base in universities, meetings of librarians were held in different parts of the country and their views and feedbacks were obtained. Based on the feedbacks received from librarians, e-resources of various publishers were identified and evaluated before negotiating licensing arrangements. Keeping in view the diversity of academic programmes offered by various universities, every attempt was made to subscribe to e-resources that are multidisciplinary in nature with wide scope and coverage.

E-resources were evaluated:

- Qualitative and Quantitative contents.
- Coverage.
- Their availability on different platforms and their comparative advantages /disadvantages.
- Rates applicable for these resources to individual institutions as well as to other consortia.

The E-resources proposed for consortia-based subscription were selected based on the following major criteria.

i). Resources from scholarly societies, university presses and not-for-profit projects were preferred over commercial publishers.

ii). Well-established multi-disciplinary resources with broad coverage were preferred over highly specialized sources targeted for specialists.

iii). E-resources already on subscription in the beneficiary universities were preferred over those which are not being used in any of them.

iv). Resources that are ‘electronic-only’ were preferred over those that are print-based.

v). Resources that are very important but highly cost-intensive were preferred over those which are less important or less-used but low cost.

vi). Resources where electronic versions are made available free on subscription to their print versions were avoided as far as possible; and

vii). Selections were made on usage / suitability of e-resources to universities.

5.2. E-resources Subscription

Once the E-resources proposed for subscription are identified, proposals are invited from the publishers of e-resources / their authorized representatives. E-publishers / their representatives are invited for formal negotiations on their products and services. In the formative years of the Consortium, the National Steering Committee negotiated the lowest rates of subscription and favourable terms of agreement.
Negotiation for subscription to e-resources will now be done by a Negotiation Committee that will be constituted by the Governing Body of the INFLIBNET Centre as per the purchase rules of the Centre.

While the National Steering Committee takes policy decision regarding inclusion of member institutions, e-resources, etc., the Negotiation Committee is responsible for negotiating rates of subscription to e-resources with different publishers for all universities. Once resources and members universities are finalized, the INFLIBNET Centre places order for subscription to e-resources to the publishers as per the purchase rules of the Centre. The INFLIBNET is also responsible for signing License agreement on behalf of the number of universities covered under the programme. INFLIBNET supports the administrative management of Consortium from its headquarter at Ahmedabad. Director, INFLIBNET Centre is Chief Coordinator of the Consortium.

5.3. Terms and Conditions of Subscription and Major Items of Negotiation

The “Terms and Conditions of Subscription to E-resources” and “Major Points of Negotiations” that are considered while negotiating rates of subscription with the publishers.

5.4. E-resources: Methodology

Methodology adopted for selection of existing e-resource is described above. Member universities may send their suggestions for adding new resources to the Director, INFLIBNET Centre or to the Chairman, National Steering Committee. Proposals for new resources are discussed in the meetings of the National Steering Committee of the Consortium. If resource proposed for subscription qualifies the criteria of selection mention above, the resource is selected for further processing. Trial access for the resource is arranged from the publisher and its usage during the trial period is assessed. On successful completion of trial, negotiations are carried out with their publishers for providing differential access to selected e-resource. The subscription prices negotiated by the Negotiation Committee are placed before the National Steering Committee in their meetings for approval. Once the rates of subscription are approved, by the National Steering Committee, additional allocation is sought from the UGC. New resources are added once additional allocation is received from the UGC.

5.5. Allocation of Resources to the Universities

The National Steering Committee allocates resources to the universities based on following criteria:

- Availability of ICT infrastructure in universities
- Number of students enrolled at UG, PG and doctoral level
- Number and nature of academic programmes offered at PG and doctoral level
Universities were inducted into the programme in three phases. In the first phase that began in 2004, access to all e-resources from 18 publishers (subscribed in 2004) was provided to 50 universities who had Internet connectivity under the UGC-Infonet Connectivity program of the UGC. In the second phase, 50 more universities were added to the programme as soon as these universities got connectivity under the UGC-Infonet Connectivity program of the UGC. 50 universities covered in Phase II have access to 14 e-resources. In the third phase, 93 more universities and Inter-University Centres were added to the programme in the year 2014. The Phase III universities have access to only few resources based on their requirements. So far 193 out of 249 universities that come under the purview of the UGC, have been provided differential access to e-resources subscribed by the Consortium. All Inter-university Centres and the UGC Headquarters also have complementary access to selected e-resources. The following parameters were used for allocating resources to different universities.

5.6. Eligibility

All universities covered under Section 12B of the UGC Act, 1956 are eligible to get access to e-resources through the Consortium. Initially, 50 universities with potential for excellence in research were covered under the scheme. Subsequently, the service was extended to 50 additional universities. The facility has been extended to 193 universities till May 2014.

5.7. License Agreements

All electronic resources available through the Consortium are governed by license agreements. The terms and conditions for using these resources are spelled out in license agreements that are signed with each publisher by the Consortium on behalf of its member universities. The licenses for electronic resources impose two types of restrictions on its usage, namely i) who can use these resources; and ii) how the resources can be used. The first restriction defines authorized users for e-resources, which generally includes students, faculty, staff and onsite visitors of a subscribing institution. The second restriction deals with how these resources can be used. It is the responsibility of individual users to ensure that e-resources are used for personal, educational and research purposes only. Most of the agreements entered into by the Consortium and publishers specify items that users are prohibited to do. Some of them are as follows:

- Systematic or programmatic downloading, retention, and printing are prohibited. For example, a user cannot download entire issue of a journal or print out several copies of the same article.
- Electronic distribution of content is also restricted although the specific restrictions vary from publisher to publisher. It may be permissible to forward an article to another
colleague in the same institution by e-mail; however, transmitting an article to someone outside of the institution, or to a large group of recipients, a mailing list, or an electronic bulletin board, is not allowed.

- Faculty in a university can print out a copy of an article from an electronic journal and include it in their course pack. However, multiple copies should not be made for circulation. Copyright laws protect published material in any format so that it cannot be copied except in accordance with fair use. Providing access to material for educational purposes falls within the realm of fair use.
- Subscribed e-resource should be used for educational and research purposes and not for commercial purposes.
- Providing electronic links to the licensed resources on the course web pages is permitted but it is not permissible to post a PDF of an article on a website. However, a researcher can post a pre-print of an article written by him.
- As with any kind of scholarly communication, a researcher can use phrases or quotes from other articles and cite the source of information. However, a researcher is prohibited from using large chunk of information.

5.8. Violation of License Agreements

Publishers track the use of their electronic resources in terms of number of downloads made by subscribing institution. Misuse, if any, is notified to the subscribing institution with details of kinds of violations and institution is expected to take action. The publisher also suspends the access to e-resource pending suitable action by subscribing institution. The access is stopped not only for journals where license agreement was violated but for all journals by the same publisher. Moreover, the access is suspended not only for the individual violator but for the entire institution.

6. E-Resources Accessing

All electronic resources that are being subscribed through the Consortium are made accessible from the publisher’s Website. The INLIBNET Centre maintains a website especially for the Consortium for the benefit of its member universities. The Web site provides details of e-resources, its URL, member universities and resources subscribed for each one of them. The access to electronic resources is IP-enabled for the member universities. As such a user does not require “Login ID and Password” to access resources available to his / her university, instead, the resources are accessible to them anywhere on their Campus network. Most universities provide links to such resources through their website.

The Consortium also maintains a website (http://www.inflibnet.ac.in/econ/) with a list of Frequently Asked Questions (FAQ) and their Answers. Users are encouraged to use the Consortium websites for correct URLs. While, the IP addresses provide by the ERNET India (current Internet Service Provider) to the universities under the UGC-INFONET Programme are already registered with the publishers for access to e-resources, universities may obtain
additional bandwidth from any other Internet Service Provider (ISP). However, IP addresses associated with the additional bandwidth should be communicated to the Consortium as well as to the publishers for getting access to e-resource on additional IPs. The INLIBNET Centre maintains a web site especially for the Consortium for the benefit of its member institutions. The Web site provides details of e-resources, member institutions and resources subscribed by each one of them. The Consortium acts as a bridge between members, publishers and funding agencies.

### Conditions of Use and Licensing Restrictions for Electronic Resources

The Consortium subscribes to thousands of electronic journals and bibliographic databases for use by authorized users in member institutions. The terms and conditions for using these resources are spelled out in electronic resource license agreements with each publisher. It is the responsibility of individual users to ensure that the use of electronic resources does not breach the terms and conditions specified in the license agreements. Licenses vary from publisher to publisher; however, the general principles are as follows:

<table>
<thead>
<tr>
<th>Permitted</th>
<th>Not Permitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>i). Viewing, downloading, copying, printing and saving a copy of search results</td>
<td>i). Use of robots or intelligent agents to do systematic, bulk or automatic downloading is not permitted</td>
</tr>
<tr>
<td>ii). Viewing, downloading, copying, printing and saving individual articles</td>
<td>ii). Systematic downloading or printing of entire journal issues or volumes, or large portions of other e-resources is not permitted</td>
</tr>
<tr>
<td>iii). Using e-resources for scholarly, educational or scientific research, teaching, private study and clinical purposes</td>
<td>iii). Using e-resources for commercial gain is not permitted (i.e. reselling, redistributing or republishing licensed content)</td>
</tr>
<tr>
<td>iv). Sending a copy of an article to another authorized user (i.e. current faculty, students or staff)</td>
<td>iv). Transmitting, disseminating or otherwise making online content available to unauthorized users (i.e. sending to mailing lists or electronic bulletin boards) is not permitted</td>
</tr>
<tr>
<td>v). Posting the URL to the publisher's version of the article on a class website</td>
<td>v). Posting the publisher's version or PDF of an article to an open class website is not permitted</td>
</tr>
</tbody>
</table>

### 7. Universities Member

The membership of the Consortium, as on now, is restricted to universities that are covered under 12 B of the UGC Act. However, it is proposed to extend access to e-resources to colleges as well as to Associate Members.
7.1. Core Members: Universities

All universities covered under 12 B of UGC Act are eligible to avail this service. These universities are considered as core members of the Consortium. All expenses on subscription to e-resources for these universities are borne by the UGC. There is a great deal of variation amongst these universities in terms of number of students enrolled and their levels (UG, PG, Doctoral), number and nature of academic programmes offered, research orientation, teaching orientation and availability of ICT infrastructure. Considering the diversity of resources required and ICT infrastructure available in these universities, 193 universities currently covered under the programme are grouped.

**E-Resources in UGC-INFONET Digital Library Consortium**

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Electronic Resources</th>
<th>URL</th>
<th>No. of Jrnls.</th>
<th>No. of Univ.</th>
</tr>
</thead>
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<td>1.</td>
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<td>117</td>
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<tr>
<td>2.</td>
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<tr>
<td>3.</td>
<td>American Institute of Physics Archive</td>
<td><a href="http://journals.aip.org/digital_archive.html">http://journals.aip.org/digital_archive.html</a></td>
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<td>APS</td>
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<td>124</td>
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<tr>
<td>5.</td>
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<td>33</td>
<td>135</td>
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<td>6.</td>
<td>CUP-STM</td>
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<td>10.</td>
<td>Institute of Physics</td>
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<td>17.</td>
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<td>64</td>
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<td>Project Muse</td>
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<td>20</td>
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<td>22.</td>
<td>ScienceDirect (10 Subject Collection)</td>
<td><a href="http://www.sciencedirect.com">http://www.sciencedirect.com</a></td>
<td>1036</td>
<td>77</td>
</tr>
</tbody>
</table>
List of E-Resources Subscribed for 2014

8. INFLIBNET Role

The INFLIBNET Centre acts as a nodal agency for implementation, monitoring and execution of the entire programme through the committees mentioned above. It coordinates all activities concerned with negotiation, renewal of subscription of e-resources and subsequent trouble shooting on behalf of the Consortium. The Centre also promotes cooperation amongst member universities and facilitates better terms of references for use and preservation of subscribed electronic resources.

INFLIBNET is responsible for:

- Coordinating meetings of its Committees.
- Constitution of Negotiation Committee through its Governing Board.
- Negotiating rates of subscription and its terms and conditions.
- Ensures IP-based access of subscribed e-resources to beneficiary universities.
- Attend to the problems faced by universities and liaison with publishers to resolve such Problems.
- Develop tutorials and promotion materials, impart training and technical support to member universities.
- Propagate the Consortium amongst other institutions so as to extend its benefits to other institutions by enrolling Associate Members.
- Evaluate subscribed e-resources and monitor its usage regularly.
- Signs license agreement for access to various electronic resources on behalf of Members.
- Maintain and update website of the Consortium.
• Organize awareness programme to promote e-resources.
• Improve cooperation and communication amongst member universities;
• Measure impact of access to e-resources on research output in beneficiary Universities.
• Present periodic report to the UGC on extent of usage of e-resources, economics of the consortium and its impact on research output.

9. UGC Role

The UGC-INFONET Digital Library Consortium is fully funded by the University Grants Commission. The UGC is responsible for constituting the National Steering Committee of the Consortium. The UGC is also responsible for making policies, monitoring the progress, coordinating with other Consortium in the country and to ensure gradual decrease in subscription of print resources in the beneficiary institutions. The UGC also monitors usage of e-resources and its impact on research output in beneficiary universities.

CONCLUSION:

The UGC INFONET Digital Library Consortium is to provide access to qualitative electronic resources including full-text and bibliographic databases to academic institutions at a lower rates of subscription. The consortium headquarter is assigned to function as a resource center with an aim to cater to the needs of its members for resources accessible to them in electronic media or are available in print media. With subscribed resources accessible online in electronic format, the member libraries would have less pressure on space requirement for storing and managing print based Library resources. Library Consortium is the best way of a common infrastructure and it has become very important in the last two decades with the emergence of e-publishing. Libraries have realized or have to realize that working together can accomplish far more than they can do individually. The age of library consortia is at the doorsteps to prove cooperation locally, regionally, nationally and internationally.

REFERENCES:

1. http://www.inflibnet.ac.in/.
2. Indest Consortium website