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## **ELECTRONIC INFORMATION SEEKING BEHAVIOR OF SCIENTISTS AND RESEARCH SCHOLARS OF CSMCRI BHAVNAGAR**

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### **Abstract**

Electronic resources are having an edge over its print counterpart. Because of the browsing, searching, multi-access capability, 24x7 access, remote accessibility, etc. It is gaining popularity among the scientific and research community through out the world. In India, CSIR consortium is providing access to more 4500 scholarly journals and databases to the scientists and researchers working in CSIR laboratories all over the country. Information seeking behavior in electronic environment need to be understood to render more qualitative services to user community. The paper discusses the electronic information seeking behavior of the scientists and research scholars of the Central Salt and Marine Chemical Research Institute, Bhavnagar, Gujarat

**Keywords:** User Study/ Information Seeking Behaviors/ Electronic Resources Access/ Electronic Resources-Use

### **1. Introduction**

Information and Communication Technology has dynamically affected the information seeking behavior of the user community. Basically the emergence of internet technology has made it possible for the remote access of databases. Now- a- days, access is considered more important than ownership. In the changing scenario, library and information centers have to focus towards the user community in understanding their changing information needs and information seeking behavior.

Through the consortium initiative in India, Library and Information Centers have access to a good number of electronic journals and databases. Due to the addition of new resources to the library collection, it is important to asses the problems faced by the end users. The CSIR Consortium initiative provided access to a huge number of scholarly e-journals and databases in various disciplines relating to marine sciences.

Several studies have been conducted through out the world to know the electronic information seeking behavior. G. Marchionini (1995) [4] has studied the changing information seeking behavior in electronic environment. Linda Guyotte Stewart (1995) [7] has interviewed chemists at Cornell University to study the acceptance of electronic journals. It is very important to study the information seeking behavior of users in specific subject areas specially in the changing environment.

## **2. Methodology Followed**

Questionnaire method has been used to collect data. Both e-mail and print based questionnaire have been circulated among the scientists and research scholars of Central Salt and Marine Chemical Research Institute. 122 questionnaires have been received and analyzed for the present study.

## **3. Information Seeking Behavior in Electronic Environment**

Again several studies have been conducted to understand the Information Seeking Behavior of Scientific and research community. Different authors have conducted studies relating to the information seeking behavior both in print and electronic based library environment. A study conducted by C. M. Brown, (1999) [1] to understand the information seeking behavior of scientists in the electronic information age covering scientists from several subject areas like astronomers, chemists, mathematicians, and physicists. Another study from W. Charles, H. T. Nancy, and A. E. Barbara [2] show significance of electronic resources and its usage among the medical science professionals. According to a study by Gleeson (2001) [3] scientist at the National Institute of Environmental Health considered electronic Journals as important resources for their routine purposes. The present study is significant because it covers the scientists working in areas relating to marine chemicals and studies their changing approach towards the electronic resources after the access to CSIR consortium resources.

## **4. Information Seeking Behavior of Scientists and Research Scholars at CSMCRI**

Central Salt and Marine Chemicals Research Institute is one of the leading laboratories of CSIR established in 1954. The institute has around 350 staff on its roll and sizable number of project assistants and research scholars pursuing their doctoral programme. The primary objective of the institute is to be highly creative and result oriented laboratory that synergizes internal and external capabilities to constantly improve upon and popularize the knowledge and innovations required for utilization of coastal and wasteland resources and seize new opportunities to expand and utility of the competency base. The thrust areas in R&D activities revolve around the following areas: Inorganic Chemicals, Catalysis, Membrane Science and Separation Technology, Bio-salinity, Application of non-conventional energy sources and Environmental monitoring.

The CSMCRI Library is considered to be a premier one having a rich collection of books, periodicals, reference materials, etc. in the areas of R & D being carried out in the

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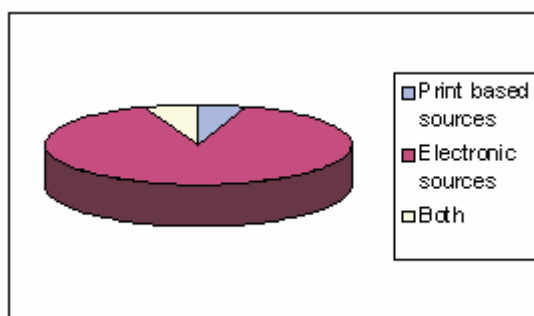
Institute. Besides catering to the information needs of R & D staff of the institute, the Library also extends facilities to the Visiting Research Scholars, University Staff, R&D Staff of the Industries, Government Officials and others.

CSMCRI is a member of CSIR e-journal consortium. CSIR e-journal Consortium is a network project implemented by National Institute of Science Communication and Information Resources (NISCAIR). CSMCRI is having an access to 4500 scholarly e-journals and databases covering following publishers: Elsevier, Springer, ACS, RSC, Blackwell, OUP, Cambridge, and John Wiley.

The subscribed electronic resources are highly beneficial to the users of the Library. But it is important to understand the changing behavior of scientists and research scholars in electronic environment.

**4.1 Primary Sources of Gathering Information**

Type of resource	Number of Resources	Percentage
Print based sources	6	4.92 %
Electronic sources	109	89.34 %
Both	7	5.74 %



*Primary Sources of Gathering Information*

Electronic sources are the primary source for gathering information. 89.34% of the total respondents are gathering electronic sources as compared to 4.92% are using only print based sources. 5.74 % of the respondents are using both types information sources for gathering information.

#### 4.2 Type of E-resources Referred

Sl. No	Type of Electronic Resources	Respondents	Percentage
1	E-Journals	100	62.89 %
2	CD-ROM Database	10	6.29 %
3	Online Database	47	29.56 %
4	Any Other	2	1.26 %

*Table-2 Type of E-resources*

62.89% of the total respondents preferred electronic journals where as 29.56% respondents shown their likeness for online databases. It is clear from the above table that the most electronic resources are preferred among the scientist of CSMCRI.

#### 4.3 Convenience in Gathering Information

Sl. No	Convenience in gathering information	Respondents	Percentage
1	Easier	109	89.34%
2	As earlier	12	9.83%
3	More difficult	1	0.81%
4	Much more difficult	-	-

*Table-3 Convenience in Gathering Information*

109 respondents (89.34%) indicated that electronic resources have made information gathering easier, where as 12(9.83%) respondents have indicated there is no change in information gathering. Very negligible number of respondent have indicated that electronic resources have made more difficult for their information gathering.

#### 4.4 Purpose of Gathering Electronic Information

Sl. No	Purpose of Gathering Information	Respondents	Percentage
1	Updating knowledge	102	41.13%
2	Writing paper & Presenting paper	57	22.98%
3	Guiding researches	56	22.58%
4	Preparing answer to Specific question	28	11.29%
5	Any other	5	2.02%

*Table-4 Purpose of Gathering Electronic Information*

102(41.13%) respondents indicated the primary purpose of gathering information is updating knowledge, where as 57(22.98%) respondents indicate that the purpose of

gathering electronic information is to write papers and present papers. 56(22.58%) respondents are gathering information to guide researchers, where as 28(11.29%) respondents are gathering electronic information for preparing answer to specific question. Only five respondents are gathering information for some other purposes.

#### 4.5 Archival Access to E-journals

Scientists and research scholars are also getting the benefit of archival access of publications through the CSIR consortium.78.76% i.e. 89 scientists and research scholars are accessing the archives of various publications where as 19.47% scientists and research scholars are not accessing the archive of e-journals.

#### 4.6 Availability of E-Resources

77.05% i.e. 94 scientists and research scholars are highly satisfied with the subscription of e-resources by the library in their research areas, where as 22.95% i.e. 28 respondents are not satisfy with the e-resources subscribed by their library.

#### 4.7 Feature of E-Resources

Electronic resources are having several useful features.

Sl. No	Features	Respondents	Percentage
1	Searching	85	54.49%
2	Browsing	22	14.10%
3	Hyper linking	39	25.00%
4	Alerting	10	6.41%

Table-5 Feature of E-Resources

Among the four important features of electronic resources, searching is more useful feature for the scientists and research scholars. 85 (54.49%) scientists and research scholars' indicated that searching is a very useful feature. Article Alert (6.41%) is an important feature for scientists and research scholars followed by hyper linking (25%) and browsing (14.10%). Alerting feature is not popular among the potential users of the Library.

#### 4.8 Formats of E-Resources

Sl. No	File Formats	Respondents	Percentage
1	HTML	13	10.08%
2	PDF	114	88.37%
3	Post Script	2	1.55%
4	Any other	-	-

Table-6 Format of E-Resources

Electronic resources are available in various file formats. But in e-journal publications papers are available mostly in PDF or HTML formats. 114 (88.37%) respondents are preferred papers in PDF formats, where as 13 respondents preferred HTML file formats.

#### 4.9 Place for accessing E-Resources

Sl. No	Place	Respondents	Percentage
1	Library	13	9.77%
2	Computer center	16	12.03%
3	Workplace	100	75.19%
4	Any other	4	3.01%

*Tabl-7 Place for accessing E-Resources*

Most of the scientist and research scholars preferred workplace for accessing electronic resources. 100(75.19%) respondents prefer workplace to access e-resources where as 16 scientist/research scholars preferred computer centre for accessing electronic resources. Again 13(9.77%) scientists/research scholars are going to library for accessing electronic resources. It is because library is having some computers for the users. But 4(3.01%) of the scientists/research scholars are using other places like home, café for accessing e-resources.

#### 4.10 Common Interface for Searching E-resources

Common interface like search engines and portals are generally used by 55.56% i.e. 65 scientists and research scholars, but 44.44% i.e. 52 scientists and research scholars are not using any common interface for searching their required electronic information.

#### 4.11 Downloading of Electronic Information

Sl. No	No. of articles downloaded per week	Respondents	Percentage
1	10- 20	59	50.00%
2	20-30	30	25.42%
3	30-50	20	16.95%
4	More than 50	9	7.63%

*Table-8 No. of articles downloaded per week*

50% of the respondents are downloading 10 to 20 articles per week, 30(25.42%) respondents are downloading 20 to 30 articles per week, where as 20(16.95%) respondents are downloading 30 to 50 articles per week but the number of respondents who are downloading more than 50 articles per week is only 9(7.63%).

#### 4.11 Download Speed of E-Journals

80 scientists and research scholars are satisfied with the downloading speed of electronic journal, but 40 respondents are not satisfied with this speed of downloading.

#### 4.12 Preferred Electronic Publications

Sl. No.	Name of the publisher	Number of user
1	American Chemical Society	58
2	Royal Society of Chemistry	43
3	Elsevier Science	87
4	Springer link	32
5	Willey	35
6	Blackwell	21
7	Other	96

*Table-9 Preferred Electronic Publications*

Among the electronic Publishers both society and commercial publishers, Elsevier Science is most preferred publisher among the Commercial where as American Chemical Society Publication is preferred most among the Society Publication.

#### 4.13 Personal/Individual Subscription to E-Resources

Most of the respondents have replied that they are not availing any personal subscriptions but 25% i.e. 30 respondents have stated that they are availing personnel subscription for electronic resources. This may cover free access to members of various Professional bodies.

#### 4.14 Access to Freely Available Internet Resources

Freely available electronic resources on the internet are highly useful for 67.21% i.e. 82 scientists and research scholars, where as 1 scientist or research scholar felt that the freely available electronic resources are not useful.

#### 4.15 Effect on the Scholarly Activities

In answer to a question that which activity is most influenced by the emergence of internet, 54.48% i.e. 73 respondents have replied that the most influenced activity is scholarly communication 44.78% i.e. 60 respondents indicated that the most influenced activity is collaborative research and according to 1 respondent, other activities are influenced by the emergence of internet.

#### 4.16 Electronic Dissemination and Information Gathering Habit

Electronic dissemination of information has affected the information gathering habits of the 75 scientists and research scholars substantially, 39 scientists and research scholars believe that their information gathering habits has been affected moderately where as only 3 scientists or research scholars stated that the electronic dissemination of information has not affected their information gathering habit at all.

#### 4.17 Library Staff Support

80(66.67%) respondents seek help of library staff for their information gathering activities where as 40(33.33%) respondents have not felt any need of library staff for their information gathering activities.

#### 4.18 User Education Programme

Orientation programme for effective searching of electronic resources has been taken by 83(68.03%) scientists or research scholars, where as 39(31.93%) scientists and research scholars have not availed any orientation programme .

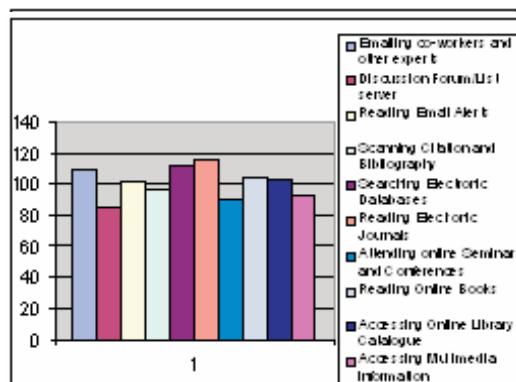
#### 4.19 Electronic Information Seeking Behavior

Sl. No.	Type of e-Information Seeking Behavior	No.of Respondents
1	Emailing co-workers and other experts	109
2	Discussion Forum/List server	85
3	Reading Email Alerts	101
4	Scanning Citation and Bibliography	96
5	Searching Electronic Databases	112
6	Reading Electronic Journals	115
7	Attending online Seminar and Conferences	90
8	Reading Online Books	104
9	Accessing Online Library Catalogue	103
10	Accessing Multimedia information	93

*Table:10 Type of e-Information Seeking Behavior*

The electronic information seeking behavior among the scientist and research scholars are quite interesting. Reading e-Journals is a very important information seeking behavior where as participating and discussing is the least important information seeking behavior among the scientists and research scholars.





*Electronic Information Seeking Behavior*

### 5. Observations

It can be observed from the above study that electronic sources are the primary sources of accessing information. But electronic journals are most preferred resources among the electronic resources. Updating knowledge is the primary purpose of gathering information. It can be observed most of the users are happy with the library subscription of electronic resources. For several publications archival access is also available.

In the preliminary survey, it can be observed that searching is a useful feature in electronic resources where as browsing, hyper linking are other feature useful. For downloading articles PDF file format is most preferred. Search Engine and Portals are Common Interface for searching electronic resources for most of the scientists and research scholars. 10-20 full text articles are downloaded per week by maximum number of scientists and research scholars. Relating to the speed of downloading, most of the scientists are satisfied.

About the resources it has been observed that American Chemical Society Publication is highly preferred society publications, where as Elsevier Science among other commercial publishers. Beside the subscribed resources, free Internet resources are useful for most of the scientists and research scholars.

It is observed that scholarly communication and Collaborative research activities of scientist and research scholars are most effected activities by the emergence of internet.

Regarding the electronic information seeking behavior, it has been observed that workplace is most preferred place to access E-Resources and majority of the scientists and research scholars are realizing that information-gathering habits have been substantially affected by electronic resources. Again it can be observed among the scientists and research scholar's that reading electronic Journals and searching online

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databases are very important information seeking activity among the scientists and research scholars.

Role of Library staff cannot be ruled during the process of information seeking behavior. Majority of scientists and research scholars are seeking help of its Library Staff for accessing the electronic resources. Again it has been observed that User Orientation programme is useful for effective use of electronic resources.

## **6. Conclusion**

In the above paper, several general questions were asked relating to the use and access of electronic journals and databases. This paper came out with several important points relating to the access, use and preference in publication, archival access, habits in seeking electronic information etc. which will help the Library and Information science Professionals for better management of electronic resources.

The subscription rates of electronic journals are quite costly and increasing annually, so cancellation of the resources is also important. So, users need to be asked about their immediate requirement in frequent basis. Effective utilization of electronic resources can be possible by conducting user studies.

## **7. Acknowledgement**

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## **References**

1. Brown, CM. Information seeking behavior of scientists in the electronic information age: Astronomers, chemists, mathematicians, and physicists. *Journal of the American Society for Information Science*. 1999.;(10): 929-943.
  2. Charles W, Nancy H. T., and Barbara A. E. Information-seeking behavior and use of information resources by clinical research coordinators *Medical Library Association*. 2006 January; 94(1): 48-54.
  3. Gleeson, A.C. Information-Seeking Behavior of Scientists and their Adaptation to Electronic Journals. University of North Carolina dissertation. 2001.
  4. Marchionini, G. Information Seekers and Electronic Environments. In *Information Seeking in Electronic Environments*. Cambridge, MA: Cambridge University Press. 1995; pp. 11-26.
  5. Marchonini, G. "Information Seeking in Electronic Environments" New York, Cambridge University Press, 1995.
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7. Stewart, Linda Guyotte. User Acceptance of Electronic Journals: Interviews With Chemists at Cornell University. *College & Research Libraries* 57 (July 1996): 339-349
8. <http://www.csmcri.org> (Search on Dt. 01.01.2007)

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