

Information Seeking Behaviour among DRDO Scientists in Defence Research Laboratories: A Study

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Abstract - The purpose of the study is to examine the factors of information seeking behaviour among DRDO scientists in Defence research laboratories. This study adopted the questionnaire method for collecting primary data from the scientists. Hundred scientists have participated in the study. The finding of the study suggests that the attitude and perceived usefulness of the technical based information significantly influences the behavioural intention of the scientists on using the online and internet resources for the research purposes. The study revealed that the perceived usefulness of the online resources is significantly influenced by the perceived ease of using information. The results of this study will be useful for library professionals to enhance the online resources within the laboratories for its effective and efficient use for research purposes by the scientists.

Keywords: Information Seeking Behaviour, Online Resources, Information Communication Technology, Research

I. INTRODUCTION

The information seeking process is subject to change in the context of the digital world. Information seeking is said to be information behaviour of human beings with respect to access the information through channels. The information seeking is said to be of two types via an active information for online users and passive information for offline users. In general, information seeking is a potential process to satisfy the needs and acquiring information users. It is a micro level behaviour used by the researchers towards collection of information from various locations. It explains the relationship between seekers and the systems. Information seeking could be done via internet and artificial intelligence. The searching technique has 5 stages viz cognitive, affective, actions, strategies, and information search progress.

The information searching progress involves the multiple techniques to get ease of information seekers. First actions required the task regarding specific components, topic selection, and outcomes of results, keywords, predicting outcomes, and collection of information. According to theory of Choo *et al.*, (2000)^[4] manifestoes, information seeking behavior in terms of modes and moves, where modes were based on Eli's model combining : starting, chaining, browsing, differentiating, monitoring, extracting

and where moves were based on whether individuals need specific information and whether individuals have plans.

II. REVIEW OF LITERATURE

Senthil, *et al.*, (2018)^[1] signifies the DRDO e-journal consortium in Defence science and technology. Their study analyzed the information seekers on DRDO scientists and to confine the period during 2009-2016. The study covers the consortium subject coverage, publishers wise, growth of publication of the particular subject and usage statistics by the labs. They found the consortium has sufficient source to the scientific community that gets more information in their research progress.

Sapa *et al.*, (2014)^[2] analyses the information seeking behaviour of mathematicians: scientists and students. Their study analyzed the factors of acquiring information from the internet and online resources among the scientists. The study covers the formulate queries, keyword searching, ability of searching technique to the scientists and students. The results revealed the significant difference between two groups of mathematicians.

Hemminger *et al.*, (2007)^[3] discusses about the information seeking behaviour among the scientists. A census survey was conducted among academic science researchers at the University of North Carolina. Their study highlights the searching ability and information seeking behaviour of scientists. The study found significant changes in information seeking behaviour among the scientists. The result of the study revealed the strong correlation between the science researcher's demographic variables and their information seeking behaviour.

III. DEFENCE RESEARCH AND DEVELOPMENT ORGANIZATION

Defence Research and Development Organization (DRDO) works under Ministry of Defence. It works towards enhancing self-reliance in Defence systems and undertakes design & development leading to the production of world-class weapon systems and equipment in accordance with the expressed needs and the qualitative requirements laid down by the Indian armed Forces. DRDO is working in various areas of military technology which includes Aeronautics,

Armaments, Combat vehicles, Electronics, Instrumentation engineering systems, Missiles, Materials, Naval systems, Advanced computing, Simulation and Life sciences. DRDO while striving to meet the cutting edge weapons technology requirements provide ample spinoff benefits to the society at large thereby contributing to the nation building. The present study provides an analytical overview of DRDO e-journals consortium and provides subject wise and lab-wise availability of e-journals. In addition, it also analyses the budgetary details and use of different e-journals available in DRDO e-journals consortium.

IV. OBJECTIVES OF THE STUDY

The following objectives are framed for the purpose of present study.

1. To identify the various types of information resources preferred by DRDO scientists.
2. To analyze the DRDO scientists' preferred information channels towards information seeking.
3. To examine the scientists' information needs and requirements in Defence Research and Development Organization
4. To analyze the DRDO scientists' level of utilization of online databases and electronic software in meeting their information needs
5. To analyze the DRDO scientists' problems using information and communication technology in their information seeking process

V. METHODOLOGY

To study the information needs and requirements of DRDO scientists, a stratified random sampling technique was adapted for the study and employed questionnaires as a tool for data collection. The collected data was analyzed and tabulated to statistical software package with appropriate tools. The information seeking behaviour was analyzed on the basis of level of utilization of online databases, electronic software, electronic resources, purposes of seeking information and problems in information seekers. The population of the study consists of 100 scientists from DRDO laboratories in Bangalore.

TABLE V PURPOSE OF VISIT

Purpose of Visit	Always	Most of the Time	Often	Rarely	Never
To refer Books	Yes				
To refer Journals		Yes			
To refer Thesis & Dissertations			Yes		
To refer Patents				Yes	
To refer Reports/ Proceedings etc.	Yes				
To refer Institutional Publications			Yes		
To use E-Books	Yes				
To use E-Journals	Yes				
To use E-Databases	Yes				
To use Internet	Yes				

VI. STUDY RESULTS AND DISCUSSIONS

A. Demographic Details

TABLE I RESPONSE RATE

Questionnaires Distributed	Questionnaire Received	Response Rate
100	100	100%

TABLE II GENDER

Gender wise Distribution of Respondents	Number	%
Male	69	69
Female	31	31
Total	100	100

TABLE III DESIGNATION

Designation wise Distribution of Respondents	Number	%
Scientist H	1	1
Scientist G	1	1
Scientist F	4	4
Scientist E	15	15
Scientist D	19	19
Scientist C	27	27
Scientist B	33	33
Total	100	100

B. Library Usage

TABLE IV VISIT TO LIBRARY

Visit to Library	Number	%
Yes	57	57
No	43	43
Total	100	100

TABLE VI SOURCES PREFERRED

Preferred Information Sources	Always	Most of the Time	Often	Rarely	Never
E-Journals	Yes				
Library Web Portal		Yes			
Institutional Repositories		Yes			
E-Resources	Yes				
E-Books	Yes				
E-Databases		Yes			
Conference Proceedings			Yes		

TABLE VII INFORMATION GATHERING ON DEFINITE TOPIC

Information Gathering Skills	Total
Searching the Shelves	36
Asking the Librarian	19
Discussion with Colleagues	10
Bibliography	15
Library OPAC	20
Total	100

TABLE IX LEVEL OF IMPORTANCE OF E-JOURNALS

Level of Importance	Total
Very Essential	16
Essential	63
Moderately Essential	19
Not Interested knowing them	2
No use at all	0
Total	100

TABLE VIII USEFULNESS OF E-RESOURCES

Use of E-Resources	Total
Yes	85
No	15
Total	100

The primary analysis was carried out by the researcher. Sixty nine respondents were males out of hundred respondents. Remaining thirty one respondents were females. The result shows the variation between male and female respondents. The majority of scientists belonged to male category.

The below table indicates the search engines frequently used by the scientists. It was noted that forty six percentage out of the total hundred respondents regularly use the Google search engine, thirty three percentage of them frequently use the Yahoo and Lycos search engines and twenty one percentage scientists use opera mini and media finder, twenty five percentage of scientist use Alta Vista, and micro fox. The results revealed that the Google search engine was very familiar among the scientists and other search engines were less preferred by the scientists.

TABLE X FREQUENCY OF USING SEARCH ENGINES

Search engines	H	G	F	E	D	C	B
Google	46.00%	12.00%	6.00%	3.00%	9.00%	11.00%	3.00%
Yahoo and Lycos	33.00%	16.00%	12.00%	19.00%	7.00%	3.00%	10.00%
Opera mini and Media finder	11.00%	21.00%	9.00%	29.00%	5.00%	20.00%	5.00%
AltaVista	25.00%	15.00%	11.00%	11.00%	33.00%	3.00%	2.00%
Micro Fox	10.00%	25.00%	30.00%	18.00%	33.00%	7.00%	7.00%

In this context chi-square test is applied for further discussion. Hence there is a significant difference between the scientists and their usage frequency and purpose of using the online and internet resources. The researcher classified the frequency group closely related to the purpose. The reason behind was that the factors influence the frequency level of the scientists. The chi-square p value is $p = 10.69$ ($.005 < 0.05$) at the 5 percent

level significance. It was found that there is an association between the purpose of using and frequency of accessing.

TABLE XI CHI-SQUARE

Particulars	Value	Df	Sig
Chi-square	10.069	7	0.05

TABLE XII GENDER WISE RATING ON PROBLEMS IN USING INFORMATION SEEKING

S.No	Particulars	Male	Female	Mean
1	Inadequate knowledge about application of some web technologies	1.85	2.53	2.19
2	Inadequate support from IT department	1.85	2.53	2.19
3	Lack of co-operation among technical staff	2.13	3.01	2.57
4	Inadequate interest among users	2.57	3.45	3.01
5	Website copyright issues	2.94	3.82	3.38
6	Need of user authentication	3.91	4.19	4.05
7	Slow loading of some websites	2.04	2.92	2.48
8	Inadequate number of computer terminals	3.69	4.17	3.93
9	Slow internet connectivity	2.79	3.67	3.23
10	Need for skill upgradation	1.74	2.22	1.98
11	High cost software	3.50	4.18	3.84
12	Updating WebPages frequently	2.48	3.36	2.92
13	Content based book service	3.03	3.91	3.47
14	Inadequate facility to upload content by users	3.96	4.24	4.10
15	Non-availability of all previous volumes of journals	1.65	2.53	2.09
16	Inadequate higher bandwidth and wireless connectivity	1.84	2.72	2.28
17	Inadequate hyperlinks to web based information services	3.27	4.15	3.71
18	Lack of digital knowledge upgrading programmes	2.25	3.13	2.69
19	Complete administrative procedure prevents effective use of web based information service	3.15	4.03	3.59
20	Average	1.90	2.78	2.34

The results table shows the impediments of accessing online and internet resources by the scientists' gender wise. The female respondents rank the first position in their overall rated problems in using ICT in information seeking as per their mean score of 3.42 securing on a five point likert scale. The male respondents hold the next position in their overall rated problems. Hence, there is a significant difference between female scientists and male scientists in their problems in using online and internet resources by the information seekers.

VII. FINDINGS OF THE STUDY

1. The results revealed that the gender wise analysis of access to the online and internet resources by the male scientists have spent more time in comparison to female scientists.
2. The DRDO scientists' frequent usage of Google search engine is the first preference with forty six percentages, Yahoo & Lycos are second preference and other search engines are least preferences.
3. The findings revealed that the scientists' information needs, rated by the indicators are access to research tools, infrastructures, financial constraints and guidelines for transfer of technology.
4. The results indicated the major difficulty in information seeking by the scientists is content uploaded, copyright issues, and internet bandwidth connectivity.

VIII. CONCLUSION

With the advent of information communication technology, it is easier to retrieve information across the world. Information seeking is continued progress of any research. This study was undertaken in an attempt to reduce the burden of scientists in information seeking from the online and internet resources. Assuredly, the online resources have been embraced by the scientists' community which fulfills their information needs. As a result, scientists emphasize on the online information for research as an appropriate technique to the information seekers. The study found that the information seeking techniques in the electronic environment significantly influences the behavioural intention of the scientists for their research purpose.

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