

## Information Needs of Library Users of Selective Metallurgical Institutions in Jharkhand

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### ABSTRACT

This paper highlights on the R&D information needs of scientists, engineers, managers and researchers in the field of metallurgy working in selective metallurgical institutions in Jharkhand, India. The study revealed that the R&D groups of these organisations used a variety of formal and informal information sources effectively in meeting their research information needs. Apart from literature search, the teams attend meetings, discussions, seminars, workshops and conferences as the major informal sources of acquiring knowledge, sharing experiences with their colleagues and experts and to establish professional contacts for exchange of knowledge. Government-funded organisations have a provision of regular budget to support their knowledge resources whereas public funded organisations are mostly project-based funding and fluctuates from time to time as also in the case of privately funded, which are mostly need-based. Similar is the case for document procurement services and knowledge sharing in all the three kinds of metallurgical organisations.

**Keywords:** Information seeking behaviour, information needs, R&D organisations

### 1. INTRODUCTION

Jharkhand is well known for its rich mineral resources. The State is the sole producer of cooking coal (32 % of India's annual production), iron, copper (25 % of India's annual production), uranium, mica, bauxite, pyrite etc. Jharkhand is equipped with a good number of educational and technical institutions like, 12 Polytechnic institutes and ITIs as well as institutions of repute such as Xavier Labour Relations Institute (XLRI), Xavier Institute of Social Service (XISS), Indian School of Mines (ISM), National Institutes of Technology (NIT), Birsa Institute of Technology (BIT) Sindri, Birla Institute of Technology (BIT) Mesra, Indo Danish Tool Room (IDTR), Central Mine Planning and Design Institute (CMPDI), RVS College of Engineering and Technology, Mahatma Gandhi Memorial Medical College and many more<sup>1</sup>. There are also number of government-, public- and private-funded R&D organisations/industries working in the area of iron and steel, coal and economic minerals in Jharkhand. Most of the industries have their R&D centre along with library and information centres where all the knowledge resources are kept for its utilisation. The productivity of an organisation depends upon the available resources at their disposal

and their judicious management. However, a very little is known about the extent of their utilisation through the published data.

An user is the key person in any scientific information system and he needs precise and specific information concerning his field of activity. On the other hand library budgets are insufficient in real terms due to ever escalation in cost of publications resulting in reduced acquisitions of publications. Thereby, the extent of inter-library loan (ILL) and enrollment of institutional membership is gaining the ground. However, all these aspects depend significantly on organisational policies and inter-personal relations. Therefore, the modern concept like e-enabled resource sharing, consortium, web-based online public access catalogue (OPAC) are emerging and becoming popular among the library professionals. The library professionals are required to be technically sound to handle all the modern tools and techniques for better understanding and also while providing effective services to their specialised users.

However, no work is reported on how information and knowledge-bases are to be provided to R&D groups, with special reference to metallurgical and

materials science in Jharkhand, to support their researcher for better productivity. Therefore, the present study encompasses the R&D information need of selective metallurgical organisations and to explore the information seeking behaviour among three types (i.e., govt.-, public- and private-organisation) of library users working in R&D institutions and industries located in Jharkhand, namely, CSIR-National Metallurgical Laboratory (NML), CSIR-Central Institute of Mining & Fuel Research (CIMFR) (Government-funded); Steel Authority of India Ltd. (SAIL), and MECON Ltd. (Public-funded); and Tata steel Ltd. and Usha Martin Ltd. (Private-funded).

## 2. LITERATURE REVIEW

Studies have been carried out to document the research needs of the users in R&D organisations and industrial library & information centres. Some earlier work has been done in Singapore, Australia, USA and UK also in India (Bhavnagar, Bangalore, Jamshedpur, Lucknow, Bhubaneswar and Delhi). The studies are based on user-interaction with libraries in general. Engineers and scientists are fundamentally different in terms of how they approach their jobs, the type and amount of supervision they require, the type of recognition they desire, and their personality traits<sup>2</sup>. Garvey & Griffith<sup>3</sup> stated that the type of information desired by scientists varies from stage to stage of their scientific research. The information produced by them is published in the form of conference paper, research articles, and as R&D reports. The scientists and researchers mostly use the information systems at their disposal to carry out their investigations<sup>4</sup>. The information seeking behaviour is mainly concerned with who needs what kind of information, for what reasons, and how their needs can be identified and satisfied<sup>5</sup>.

The relationship between scientists' information-seeking behaviors and their personal/environmental factors has been studied by Niu & Hemminger<sup>6</sup>. Most of the information scientists collect procedural information for a design or development of the project. Periodicals are highly used to the sources of information gathering<sup>7</sup>. The scientists preferred using primary sources of information, particularly journal and review articles<sup>8</sup>. Most of the researchers visit to their library weekly, to collect reading materials and using the OPAC as a preferred tool for searching the required materials<sup>9</sup>. The subscribed electronic resources are highly preferred to the R&D users of the specialised library as evident by the resultant productivity in terms of qualitative research publications compare to earlier trends<sup>10</sup>. There is a growing use of e-journals over print journals, however, which is the preferable over the other is a debatable issue<sup>11</sup>. The impact of internet and the availability of high-speed networks has enabled the library users to have access and also keep track of the

global happenings in their respective field of work<sup>12</sup>. However, there are almost no reports about the functioning types of specialised libraries in Jharkhand although their performances excel over many other similar organisations across the country.

## 3. OBJECTIVES

The present work focuses on the studies relating to the understanding of six metallurgical R&D Libraries & Information Centres (RDLICs), namely, (1) CSIR-NML, (2) CSIR-CIMFR, (3) SAIL-RDCIS, (4) MECON, (5) TATA Steel and (6) Usha Martin, and their user's information seeking behaviour.

In all these R&D LICs, the following objectives were undertaken to facilitate and organise the information resources & services to support the respective managerial, research and technical groups:

- (a) To examine the infrastructure available in RDLIC for meeting the ever growing demands of users
- (b) To ascertain the purposes of their visit and use of information resources
- (c) To study the frequency of their visits to RDLICs
- (d) To examine RDLICs user views regarding the availability of print and online resources and to find out the extent of use of these resources
- (e) To explore the information needs of the RDLIC users and to have the feedback, and
- (f) Preferences in publishing their research output (by the R&D users) and to find out the most commonly used search engines.

## 4. METHODOLOGY

The survey method and questionnaire tool has been used for data collection. A well structured questionnaire was designed for collection of data and methodology following the two studies adopted after Das<sup>13</sup> and Ramesh<sup>14</sup>. Both e-mail and print-based questionnaire (1371 numbers) containing various aspects of information seeking behaviour were circulated to the users of RDLICs. Out of total 1371 questionnaires distributed to scientists, engineers, managers, researchers, etc., 1101 were received with an overall response rate of 80.31 %. The data were analysed using MS-Excel 2007 software and suitable graphical representations were made to depict the findings. In addition to questionnaire, an interview schedule and on spot study were also undertaken mainly to collect data about the use of internet, open access, social networking, institutional repositories, online services, and CD-ROM services offered by these government-, public- and private-funded libraries and information centres under reference for their data analysis and interpretations.

**5. DATA ANALYSIS**

**5.1 Sector-wise Distribution of Responses**

A detailed survey was undertaken in all the metallurgical RDLICs and collected the data from the library users who visit regularly contributing to organisational output. The highest (90 %) responses received from CSIR-NML, whereas Usha Martin had the lowest representation (62.75 %). The responses received in all other the cases, namely, CSIR-CIMFR, SAIL-RDCIS, MECON and Tata Steel were 89.30%, 79.94 %, 70.34 % and 79.53 %, respectively. The average core user respondents of government-funded RDLICs under the study (CSIR-NML & CSIR-CIMFR) was 89.79 %. The average core user respondent of public supported RDLICs (SAIL-RDCIS & MECON) was 75.14 %. The average core respondent of Private-funded (Tata Steel & Usha Martin) was 71.14 % Therefore, the responses received depict the promptness and user-library service beneficiaries orientation as exhibited among the organisations under study in decreasing order: CSIR-NML > CSIR-CIMFR > SAIL-RDCIS > TATA Steel > MECON > Usha Martin.

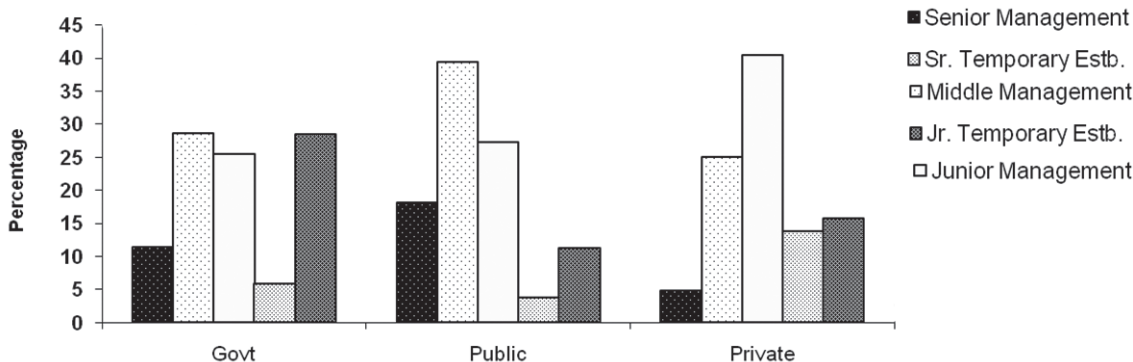
**5.2 Designation-wise Distribution**

In the present study, all the ranks of the organisations under study were grouped, depending upon the hierarchical commonalty into five levels: (i) Senior management, (ii) Middle management, (iii) Junior management, (iv) Senior temporary staff, and (v) Junior temporary staff. A close

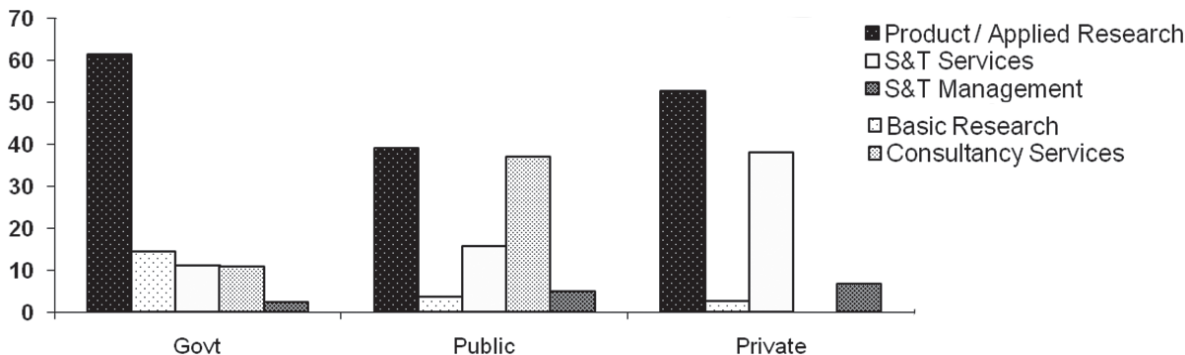
analysis of the study shows that middle and junior management (62.67%) are the major users of library information in all the organisations. However, junior temporary staffs (28.59%) are the major users in the government-funded R&D laboratories compared to those in public (11.25%) and private (14.44%) organisations. A graphical representation of designation-wise distribution of respondents of all the three sectors is shown in Fig. 1.

**5.3 Nature of Activity Involved**

It is ascertained from the study that the respondents of private, public and government-funded organisations are mainly engaged in five categories of activities within each sector, namely, applied research/product development, basic research, technical services, consultancy services and S&T management. The respondents engaged in such works are always in need of information for their day-to-day activities. From all these data, half (50%) of respondents were engaged in applied type of research and development except in MECON having least involvement. However, majority of respondents from MECON were involved in Consultancy services compared to others. Consultancy agenda were not found in Tata Steel's RD&SS division and also in Usha Martin. It is also revealed from the Fig. 2 that the maximum number of respondents from private-funded organisation (34-41 %) was involved in scientific & technical services compared to those in government (9-13 %) and in public-funded (12-20 %).



**Figure 1. Designation-wise distribution.**



**Figure 2. Activity-wise distribution.**

#### 5.4 ICT Infrastructure Availability

The level of ICT infrastructure available and functioning of the six metallurgical RDLICs under study is shown in Table 1. Users were asked to indicate the impact of ICT on their information seeking area. The use of IT in the present library environment has been able to improve the overall library management activities and able to enhance the library services, both qualitatively as well as quantitatively. Virtually all users were aware of its impact and found it beneficial to their assignments as per the data received. Study on R&D publication growth, its impact and core research areas with reference to CSIR-NML revealed that the R&D contributions made by scientist had a global impact in the field of metallurgical engineering<sup>15</sup>.

#### 5.5 Purpose of Visit to Library & Information Centre

The users visit to their library with certain purpose in mind. The respondents were asked to state their purpose of library visit. The responses received for the purpose of information seeking and visiting their library were tabulated and presented in Table 2. A set of ten parameters were chalked

out from the filled-in responses for which the users visit library and information centres.

The respondents were asked to rate these responses on four-point scale, namely, Always = 3, Frequently = 2, Rarely = 1, and Never = 0. The purpose of users visit to the library gives input to develop a need-based collection to the librarian and also develop other services and facilities to serve the users in a better way. It is evident from the table that the overall responses showed that majority of respondents frequently consult their library and information centre to fulfill their ongoing projects' information needs for research/development/design with a weighted mean (WM) of 2.21 ranking first and to keep themselves up-to-date through scanning latest arrivals/periodicals in the related fields (WM=2.13), thus ranking second requirement. Further, most of the scientist, engineers, managers and research scholars found to prefer subject specific information through use of current periodicals to keep them update in the knowledge of their field of interest. It is noted that there is a significant use of library, mainly for research purposes and it is quite natural that respondents have given top priority for this purpose.

**Table 1. Level of ICT infrastructure and activity**

Status	Government		Public		Private	
	NML	CIMFR	RDCIS	MECON	TATA	UML
Dedicated server	Yes	Yes	Yes	Yes	Yes	Yes
High speed LAN/Leaseline	Yes	Yes	Yes	Yes	Yes	Yes
Library software used	Aurum	Libsys	Libsys	Libsys	Libsys	No
Automation	Yes	Yes	Yes	Yes	Yes	No
Web OPAC	Yes	Yes	Yes	Yes	Yes	No

**Table 2. Purpose of visit in library & information centre**

Purposes for library visit	Government		Public		Private		Overall weighted mean
	NML	CIMFR	RDCIS	MECON	TATA	UML	
	(Weighted mean)						
To borrow/return documents	2.02	2.28	1.91	1.88	2.01	0.44	1.97
To collect subject specific information	2.26	2.20	1.82	1.82	2.05	0.82	1.98
For updating the latest developments in the related fields	1.94	2.18	2.25	2.16	2.18	1.53	2.13
For research, development & design (ongoing projects)	2.17	2.33	2.06	2.33	2.27	1.60	2.21
For writing a research paper for publication/ presentation	2.30	2.32	1.22	0.89	1.35	0.53	1.57
For guiding a team & sharing information with team members	1.88	1.86	1.89	1.26	1.89	1.50	1.74
Newspaper reading	1.00	1.03	1.13	1.08	0.71	0.60	1.00
For search CD-ROMs databases	1.64	1.74	1.42	1.48	1.14	1.44	1.49
Using internet and search online databases	1.79	2.07	1.48	1.52	1.71	0.56	1.67
For spending leisure time	0.67	0.72	0.80	0.86	0.81	0.19	0.76

\*Four-point score value: Always = 3, Frequently = 2, Rarely = 1 and Never = 0

## 5.6 Use of IT-based Information Materials

On the basis of the overall analysis, it was found that all level of respondents from metallurgical organisations clearly preferred using internet for e-mail services with a weighted mean of 2.97 to fulfill their information needs (Table 3), followed by online bibliographic database (2.57), e-journal (2.30), online catalogue (2.24) and standard/patent (2.15), thus ranking first to fifth in the order of preferences. On the other hand, the overall responses showed that there were the least demand of the following electronic information sources like– e-books (1.68), CD-ROMs databases (1.65), electronic bulletin board (1.07) and online thesis/dissertation (0.78) in some of the RDLICs under the study. The study also revealed that most of the problem solving and decision making was cleared through the use of the IT-based information sources and services. The respondents from the metallurgical organisations are using e-mail as a cheaper source for online document delivery system and a better preference than the postal service in terms of speedy delivery. Therefore, the IT-based information resources have changed the information seeking and dissemination patterns among the users.

## 5.7 Use of Informal Sources

The respondents were asked as to why they attend conferences, workshops and meetings. This was examined to find out any significant difference among the government, public and private-funded organisation. The overall result obtained are presented in Table 4 which shows that a large number of respondents with a highest weighted mean of 2.55 from all the three spheres have indicated that such programme are very beneficial as one can gain knowledge from listening to presentations and discussions. Further, one can also develop professional contacts and relationships through this forum. The second preference of respondents was group discussion with weighted mean of 2.07, followed by training orientation (1.83). The scientific and technical communities of these organisations attend seminars, conferences and workshops to update their knowledge and to gain more by discussion with the colleagues participated in the programme. Some of the respondents underwent for training to learn more to perform better in their field. The maximum respondents from R&D like– Tata Steel, NML, CIMFR and RDCIS take the benefits of presenting their research output among their subjects specialist and also taking the research materials of their colleagues in the form of conference proceedings,

**Table 3. Use of IT-based information materials**

Sources of IT-based information	Government		Public		Private		Overall weighted mean
	NML	CIMFR	RDCIS	MECON	TATA	UML	
	(Weighted mean)						
CD-ROMs databases	1.66	2.16	2.46	0.70	1.31	0.53	1.65
Internet /intranet /e-mail servers	2.99	2.98	2.96	2.93	3.00	2.91	2.97
Online Public Catalogue Access (OPAC)	2.79	2.71	2.25	1.51	2.26	0.63	2.24
Online bibliographic databases	2.73	2.75	2.53	2.40	2.63	1.47	2.57
E-journals	2.68	2.70	2.40	1.37	2.64	1.16	2.30
Standards/patents online	2.29	2.26	2.08	1.94	2.21	2.41	2.15
E-books	2.14	1.66	0.58	2.02	2.51	0.50	1.68
Electronic bulletin board	1.43	1.17	0.88	0.65	1.44	0.38	1.07
Online thesis/dissertation	1.07	1.59	0.31	0.21	1.01	0.03	0.78

\*Four-point score value: Always = 3, Frequently = 2, Rarely = 1 and Never = 0

**Table 4. Use of informal sources of information**

Informal sources of information	Government		Public		Private		Overall weighted mean
	NML	CIMFR	RDCIS	MECON	TATA	UML	
	(Weighted mean)						
Attending seminar, conference & workshop	2.72	2.69	2.41	2.31	2.75	2.20	2.55
Training & orientation	2.16	2.23	1.75	1.54	1.53	1.34	1.83
Group discussion	1.94	1.98	2.31	1.91	2.33	1.38	2.07

\*Four-point score value: Always = 3, Frequently = 2, Rarely = 1 and Never = 0

lecture notes and softcopy of the presentation delivered in the meeting.

### 5.8 Extent of Use of Information Services & Facilities

Information centre is a service-oriented institute. It fulfills information needs of the users and contributes for the enhancement of their knowledge. A question was asked to know the usefulness and effectiveness of information services and facilities render to their users. The users of government, public and private-funded rated their responses on a four-point scale, namely, always, frequently, rarely, and never used. The weighted mean of their responses was calculated and shown in Table 5. As per this study is concerned, online bibliographic databases was one of the most useful tools and had a weighted mean of 2.70, followed by reprography services (2.66), then reference/information services with the weighted mean of 2.27. The in-house library catalogue (OPAC) with a mean score value of 2.16 at their desktop to search / locate the document of their requisite, followed by the print document services (2.09) offered the library. Further, it is noted that Newspaper clipping services (1.86), CD-ROM databases and products (1.52), audio-visual and multimedia collection (1.05) were rarely used services, so there is less demand of these information

services. Further, sector-wise library analysis of data shows that reprography services is also one of the highly demanded services and facilities of these sectors for xeroxing the required document and articles except Usha Martin Ltd., their technical library is very small in size and collection.

### 5.9 Preferences in Use of Web Search Engines

With the increasing cost of the print publications majority of information seekers are opting for e-resources through Internet. The scientific and technical communities are looking for free access of downloading of articles. Searching for the right information is a skill for saving their time while using web-based services. The finding revealed that Google, MSN, and AltaVista are the most popular and widely used search engines among Internet users (Fig. 3). It was found that 69.39 % of the users search for information using search engine from all spheres. Google is ranked the most favourite search engine, followed by specific publishers' websites (25.07 %) by accessing it directly through the site's URL. This indicates that respondents are more familiar and comfortable with the web-based search facility and find it more reliable. It is also noted that 22 % of respondents from Usha Martin depend upon other online sources, namely, open access databases and gateway.

Table 5. Use of information services & facilities offered

Services & facilities	Government		Public		Private		Overall weighted mean
	NML	CIMFR	RDCIS	MECON	TATA	UML	
Print Document services	1.83	2.48	2.14	1.70	2.45	1.50	2.09
Reference/information services	2.37	2.45	2.17	1.90	2.50	2.44	2.27
Reprography services	2.28	2.73	2.80	2.87	2.74	1.47	2.66
Newspaper clipping services	1.45	2.02	1.90	1.85	2.19	1.41	1.86
CD-ROM databases and products	2.40	1.59	1.06	1.01	1.84	1.06	1.52
Online bibliographic databases	2.86	2.75	2.68	2.60	2.80	1.78	2.70
OPAC	2.73	2.35	2.19	1.44	2.47	0.60	2.16
Audio-visual and multimedia collection	0.94	1.18	0.81	0.89	1.63	0.66	1.05

\*Four-point score value: Always = 3, Frequently = 2, Rarely = 1 and Never = 0

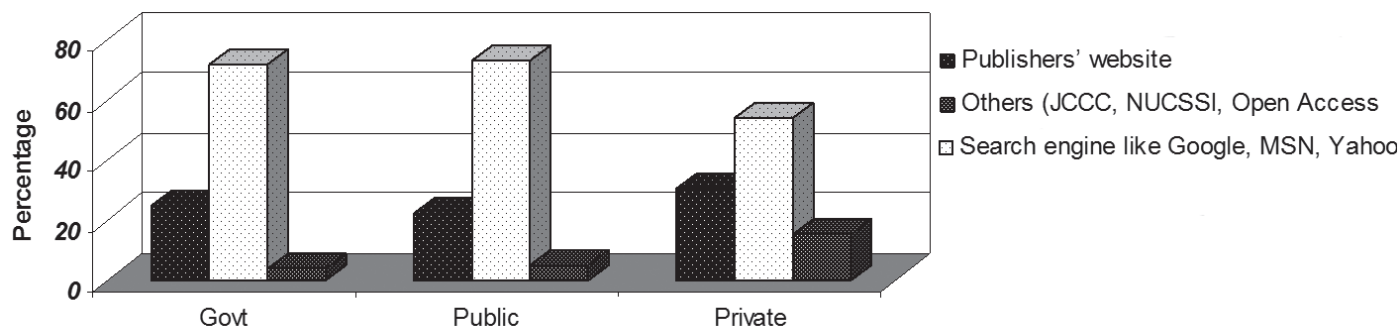


Figure 3. Preferences in use of web search engines.

### 5.10 Choice of Reading Materials

For last few decades, digital conversions of information materials for print have been ever increasing. Majority of respondents' choices were to accumulate all the required information in one place and then take out a print for reading them from the newly created file while searching on a topic which was evidenced from Fig. 4. A good number of respondents (56.77 %) preferred to take the print out of the searched information materials and stored them for ready reference and future guidance to their project team members. However, 22.80 % of respondents prefer to download the articles in their computer hard disk either for backup or sending to their colleagues on demand. About 18.98 % of the respondents would like to read the information materials on the computer screen itself. As observed from the figure that there was least representation of respondent (1.45 %) who used other method (taking screenshot of the figures, photographs, and writing on CD/DVD, etc.) for retrieving reading materials. It was observed that the government-funded organisations have a provision for

were publishing their research output in peer-reviewed periodicals/journals having in the category of *SCI* and high impact factor and presenting their papers in the International conferences/seminars organised by the reputed professional bodies. The overall results showed that 69.52 % of the scientific & technical respondents preferred for publishing in international publications, followed by 24.09 % in Indian publications and the rest (6.39%) indicated no such specific preference. It is also revealed from the study that majority of the respondents (80%) from government-funded R&D laboratories gave the reasons for publishing in foreign journals, as better coverage in online bibliographic databases, like *CSA*, *Web of Science*, *Scopus*, etc., and the timely publication are some of the other factors which influences the scientific community and preferred science citation index journals having impact factor. It is also noted that the scientists and researchers prefer to publish their research findings in publication of high repute to adorn their resume, to stand out among colleagues/peers and gain better recognition.

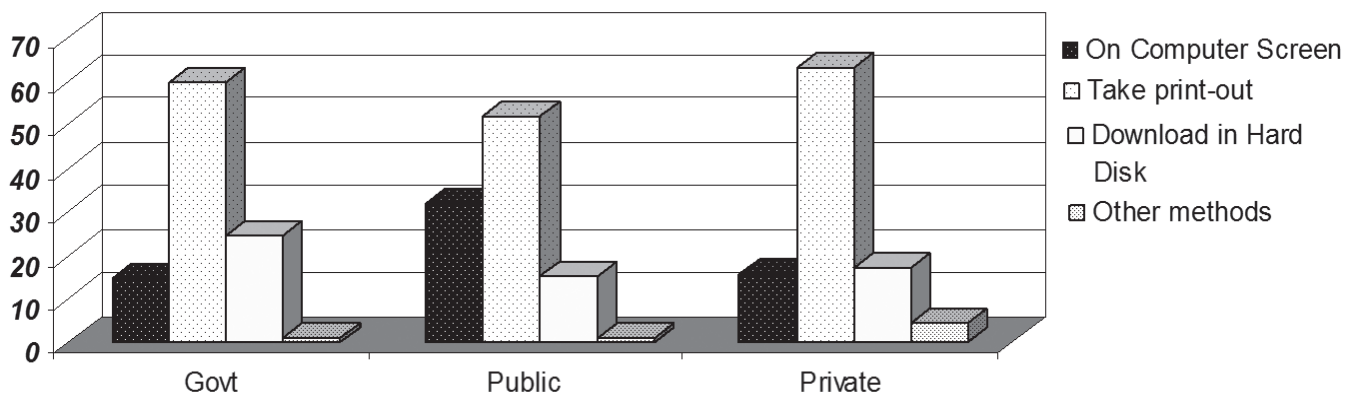


Figure 4. Choice of reading materials.

a regular budget and national network for acquiring document and online databases to fulfill need of their scientific communities. In private sector, it is need-based and having extreme fluctuation from year to year budgets whereas in public sector, it is a mix and project-based. Government R&D laboratories (CSIR-NML & CSIR-CIMFR) has a focus on the futuristic demand of technology with high science. But private and public-funded industries focus more on recent cost effective technology which can be implemented immediately. The respondents from all Groups opinion that the information which they gathered through S&T journals have high value in their ongoing projects but they stress for the timely and accurate delivery by the service providers.

### 5.11 Preferences for Publishing Research Output

It is observed that majority of the scientific community from these R&D institutions and industries

## 6. CONCLUSIONS

The findings of the present study may be useful tool for understanding of the issues in metallurgical Library and Information Centres (LICs) users and their required document management. Several important points relating to the access, use and preference in publication, archival of rare document, access habits in information seeking, etc., with respect to six metallurgical organisations under study revealed adoption of a need-based strategy with respect to the users of the type of organisations. It has been found that the government-funded LICs have a provision of better facilities and professionals and function more of a participating users like any organisational beneficiaries whereas in public-funded organisation the library personnel serve them as technical service provider only whereas in private it is getting more deteriorating as the fund flow is immediate need-, and person-based and thus sporadic

type. Therefore, the findings of the study will help the library & information professionals for better management of print/e-resources of recent times and with different types of specialised library & information centres.

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