CHAPTER–9
Conclusion, Findings and Suggestions
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CONCLUSION, FINDINGS, AND SUGGESTIONS

9.1 CONCLUSIONS: A ‘scientist needs information at every step of research work, from time that the germ of an idea sprouts in his mind to the time of its completion’ (Hemant and Prem, 2004). Science and technology have made it possible for to provide a higher standard of living through significant contributions in specific fields of national development. However, problems are faced with in the area of communication of scientific information. The most important problem is the choice of the right kind of information and the right technique for communication. Information services should be designed to provide the right information to the right person at the right time. This implies need for identification of different cadres of users, their information requirement, the different areas of work in which they are involved, where efficiency can be improved by supplying information.

The information seeking behaviour of the scientist are generally on topics of what is happening currently in the area of their concern; and who else are working in the field; introductory background information, while undertaking in a new field; the extent of prior work done in the new field; they want to get specific pieces of information and data needed at different stages of their Research and Development.

The TICs located in the laboratory are required to provide services to support activities of research and consultancy to the users of TICs. The users of TICs, are scientists involved in the Research and
Development activity and others who are contributing to the research. The major requirement of scientists are literature relevant to the programmes of the laboratory, both for the preparation of Research and Development proposals and for the use of the scientist as reading materials; information to drawing up project proposals, literature relevant to the research projects. The information requirements of the scientist would be by and large related to the contents of the Research and Development programmes. Current awareness service, Selective Dissemination of Information, Reference and literature search services are the common features of all the TICs.

The TIC services assume greater importance in the Research and Development, because of very nature of Research and Development activities and the vast size of the scientific and technical literature. The information explosion in the field of science and technology created the problems of

- difficulty in keeping touch with the new literature

- difficulty in retrieving relevant information from a larger value of literature

- difficulty in acquiring all the relevant documents.

Scientists, try to keep in touch with the new literature by browsing through the new publications. However, they may not have time to cover even a smaller fraction of the literature by all themselves. Hence, TICs role are laudable in providing services,
compiling current awareness bulletins and documentation lists, and making available online information services.

Apart from the general acquaintance with the goal of the organization, the essential step in assessing the information requirements is to obtain fairly good account of the various research projects under taken by the laboratory and the tasks of individual scientists associated with each project. This will not only facilitate the acquisition of documents relevant to the projects, but also helpful in satisfying the needs of scientists involved in the project.

Librarianship is essentially salesmanship. A satisfied customer is its best advertiser. If a potential user feels that he would not get from the library all that he needs, he hesitates to visit it and it gives an enormous impression that there is no demand for library service. ‘A library would work effectively and efficiently provided, there is a pressure of demand from the users and they insist on getting prompt service’ (Kalia, 2000)\(^{(a)}\).

The collection of TICs aim at providing latest information to the researchers/scientists working in the laboratory. They focus on collecting information rather than books. Some basic on various aspects may be required on all the areas of activities of the laboratory. Reference books providing up to date information, handbooks, monographs, technical reports are providing latest information in the activities of the laboratory.

The collection development in the TICs are mainly subject oriented. The subjects on which the laboratory carrying Research and
Development is reflected in the core collection, i.e. basic scientific and technical publications in the relevant areas of research, selective collection of literature will cover both basic books and detailed literature. The collection of books, journals, standards, technical reports, microforms, and CD-ROMs will constitute an important segment of collection.

Scientific and technical information can be viewed from the two different inter related aspects.

How new information is communicated to the scientific and technical community and

How the individual searches the information from the mass of published materials

These two are important to the average scientist or technologist for even if he does not generate new information, certainly use it; and both functions will undoubtedly be further affected by the introduction of new technology.

TICs are stimulate initiative and enhance quality of research; TIC introduce developing skill in using information technology and foster research and information seeking skills.

The primary focus of this study is on the role of the TICs towards defence research. Once, recognized that information is an asset for evaluation, this would bring better services. It contains the detailed empirical findings of the study analysis of the data collected on various TICs of DRDO and on account how they are contributing towards defence research.
9.2 **FINDINGS OF THE STUDY**: 

Present study leads to the following findings:

Information retrieval is the key activity in any scientific and technical library. The efficiency and effectiveness of library services depend on the management of the resources i.e. the judicious collection of documents in all forms including published and unpublished sources, and access to world wide sources of information. It is also effected by the utilisation of modern methods and techniques of information storage and retrieval.

Scientists greatly depend on communication with fellow specialists. Research workers almost always rely on the work of others working within the same field. Scientists not actively involved in research also frequently search for information to up-date professional information in order to perform best. They should also be in a position to acquaint themselves with innovations in their field.

There is an increasing awareness among the users on value and need for information for their professional as well as personal activities. It is impossible to achieve the self sufficiency as the universe of knowledge is dynamically growing and such a growth is reflected in its publications. Therefore, resource sharing appears to be inevitable aspect for TIC and its information services. TICs are striving their level best to achieve cooperation among themselves to facilitate early flow of information from one TIC to another.
Table -46

Approaches for information by DRDO, TIC users:

<table>
<thead>
<tr>
<th>Current Approach</th>
<th>Information about current progress in working areas of the users</th>
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<tbody>
<tr>
<td>Everyday Approach</td>
<td>Information about daily work and requirement field of the users</td>
</tr>
<tr>
<td>Exhaustive Approach</td>
<td>Involving in a thorough investigation of all the relevant information on a particular subject.</td>
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Most of the scientists using Technical information center for referring the journal articles. Sources of current information other than the journals, are the scientists attending for CEP courses, colloquiums, seminars etc.

TICs captures, stores and indexes the research work available for access and re-use through the organization. TICs are providing timely information to their clientele. Most of the user’s of TIC are agreed that, without support from the TICs, the success of defence research doesn’t exist.

The services i.e. CAS, SDI are well utilized by the user’s. The in-house publications of TICs are providing first hand information to the user community. The stalks of TICs are well organized and well maintained. The technical reports i.e. NTIS, AGARD, NASA, are providing good information to the scientists. Major amount of budget spent on subscription of Indian and Foreign Journals/Magazines, hence, making available the primary resources of information. TICs are capable of providing micro to macro level of information.
TICs are well maintained by library professionals, staff and officers of TIC are ready to help their user’s in finding the required information.

TICs had the highest satisfaction rating and the lowest dissatisfaction. Over all the role of Technical Information Centres are extraordinary towards defence research. They are playing important role in the contribution towards Defence Research.

The finding was that most of the users are satisfied and appreciated the services of TICs and agreed that TICs are playing active and key role in defence research. It has become evident that TICs are working closely with the scientist community in providing needed information in support of R & D activities of the laboratory. The TICs are playing key role in the promotion of Defence research.

9.3 **SUGGESTIONS**

Keeping in view of the ever increasing user demands and technology, solutions in the area of the following measures are essential to support defence research.

9.3.1 **Long Term Measures**: The long term measures requires, time and other infrastructure for implementation.

The TICs of DRDO are to be networked with the existing network called DRONA, which already providing the information on activities of the laboratory and other management matters, if the resources and services of the TICs are also included, it will be more useful to not only users of particular TIC but also it serves to other
laboratory users. The information technology has brought together TICs and has resulted in the concept of TICs without walls, meaning thereby that the resources of all TICs in a network are available to the whole user community. Therefore, networking of TICs is essential for each TIC to function as a true information center.

■ DRDO TICs are building their databases through a variety of software packages developed in their laboratories. Databases in different language software’s leads heterogeneity of data and it creates problems in networking. Therefore, it is desirable that a common software is to be selected looking into all future implications and a copy of this software to be distributed to all the DRDO TICs with interface programme to convert their database into designated DRDO TIC software.

■ Internet facility to be provided to all the research community, removing the restrictions

■ TICs should be assertive in ensuring that their contributions are recognized and take credit for the success of research.

■ TICs, by forging a part of Defence up-gradation and technological innovation, have to be involved in the R & D programme for ensuring R & D activities with necessary information resources and TICs with sufficient financial funds in accordance with the requests of R & D strategy.

■ To be a technological frontier in the training and development of human resources.
Cooperative acquisition of documents should be adopted and duplication in subscription of journals should be avoided. Instead number of journals subscribed can be increased.

It is observed that most of the TICs are under process of automation, those TICs who completed automation are in upper hand in terms of services. Hence, all the TICs must complete the process of automation.

Services are the output of the resources and manpower, existing in any TIC. All the TICs are providing services to their users with the resources available with in, and infrastructure facilities and with existing manpower. Hence, it is suggested that TIC staff be strengthened with more library professionals.

It is very important to improve the skills of the TIC professionals. For this, courses and workshops are to be conducted regularly.

TICs must try to fill the gap between information needs of users and the existence of information.

Translation services of the literature of foreign languages and reports to be provided.
9.3.2 **Short Term Measures:** The short term measures are which, on action can be initiated/required immediately.

- DESIDOC must function as a central agency in DRDO to collect scientific and technical information from various user groups in the defence establishment. It must also, play a coordination role in the information set up of DRDO.

- Preparation of computerized databases of serials and other holdings of all the TICs should be carried.

- TICs should be kept open for longer hours so as to enhance the use of the services.

- The Inter Library Loan service does not used properly by TIC users, because lack of knowledge about the service. Hence, it should be wide publicised.

- Lakhs of rupees spent on subscribing the journals/magazines, but the same are received after the few months/weeks of its publication, hence, the mere purpose of subscription defeated, arrangement should be made to receive the journals/magazines at an earliest.

The above suggestions are equally applicable to all those TICs which desire to have sound information management..
9.3.3 **SUGGESTIONS RECEIVED FROM HEAD, TECHNICAL INFORMATION CENTRES**

9.3.3.1 Head, TIC, Armament Research and Development Establishment, Pune, suggested that ‘All the TICs need to be networked for access to databases, and Online journals must be subscribed by joint subscriptions (consortia)’.

9.3.3.2 Head, TIC, Center for Explosives and Fire Research, Delhi, suggested that ‘TICs are one of the major inputs in to R & D program, hence, the value of TIC is maximum in our set-up, it should be maintained continuously.’

9.3.3.3 Head, TIC, Combat Vehicles Research and Development Establishment, Chennai, suggested that ‘E-Journals should be subscribed. Formation of Consortium should be encouraged and librarian should be trained and exposed to the new technologies. TIC should be equipped with innovative information handling facilities.’

9.3.3.4 Head, TIC, Defence Laboratory, Jodhpur suggested that ‘TICs of all the DRDO laboratories are networked under DRONA’.

9.3.3.5 Head, TIC, Defence Food Research Laboratory, Mysore, suggested that ‘Systematic management and procurement of recent, wanted books and circulation of relevant/important information both scientific and general to be maintained’.
9.3.3.6 Head, TIC, Defence Research Laboratory, Tezpur (Assam) suggested that ‘the present status of TIC may be upgraded to digital TIC’.

9.3.3.7 Head, TIC, Institute of Technology Management, Mussoorie, suggested that ‘DESIDOC should play a pivotal role in the development of TICs and DESIDOC should organize courses to update the knowledge of TIC staff’.

9.3.3.8 Head, TIRC, Research Centre Imarat, suggested that ‘zonal wise, TIC heads, meetings should be conducted for better cooperation and understanding’.

9.3.3.9 Head, TIRC, Terminal Ballistics Research Laboratory, suggested that ‘In order to manage the libraries and provide better services to the users, it is suggested that only persons with professional qualifications be appointed for TIRCs, and some TIRCs, particularly located in South India are progressing very fast in terms of manpower, infrastructure with the support from higher authorities, computers etc. There should be some common platform where library people could discuss their problems and gain from the experiences of fellow professionals, so that new technologies could be made available in all the TIRCs of DRDO’.