CHAPTER –6

Information and Defence Research
6.1 **Basic Need of Information**: Information is an essential resource in the process of scientific discovery, and ‘scientists are continually working to gather information from the literature, databases, web resources and colleagues. In turn, they evaluate, collect, manage, consult, integrate and apply that information to move research forward. But its importance is evident in the number of scientific researchers and information scientists striving to find better ways to mobilize and work with the ever growing body of information resources’ (Palmer et al., 2007). Today, every ‘country is eager to be on the bandwagon of research and development. A rat race is in full swing for gaining superiority in scientific and social research which has become a key factor for progress, prosperity and defence. The immediate byproduct of this unprecedented fillip to research has been too much of information. It has been estimate that one half of the present body of knowledge has been generated in the last 30 years. Patrons now expect and demand from their libraries more responsive and comprehensive services and filtered quality information tailored to their exact requirements’ (Alvi, 1997). Information forms an integral part of any Research and Development programme. It becomes all the more significant when required for strategic areas such as Defence Research and Development which are directly linked with the National security. An efficient information system is vital for the scientists to check duplication in research effort and keep up the schedules for completion of the projects by effective utilization of the information provided by the system at each stage of the project work.
Information is equally important for decision making, planning and control. For purchasing new weapons and equipment, it is only by studying cost effectiveness of various systems vis-à-vis operational effectiveness, that the choice can be made.

The, acute problem of increasing amount of literature was being first felt by scientists, technologists, and TICs. The need was that information service, should be provided by one who was a member of the research team. Researcher expected to keep in touch with research going on in the laboratory. There are many factors which are influencing to justify the growing awareness of the need for information support. A coordination of many factors has resulted in the growing need for and importance of information i.e., Growth of literature, forms of publications etc.

The scientists have been finding it difficult to cope up with literature. It is becoming more and more difficult for them to keep themselves up to date and well informed in the field of their specifications. A scientist might be in a better position if his field of interest is too narrow or totally new or unless very little has been published in that area. Now it is the responsibility of TIC and its worker to organize resources of information more efficiently and disseminate it more rapidly to reduce the time spent in searching and using.

6.2 **Importance of Information**: Information is ‘an intangible resource is used by decision makers, planners and managers as a power to manage other tangible resources i.e. man, material and money. Access to relevant information has always been important to those who influence their world consistently and successfully. Today the whole world is divided into two conceptual categories-Information rich and information poor nations. Only information rich are considered powerful and leaders of the society. Information is a vital
resource which acts as a driving force for technological as well as societal development of any nation. A nation which is rich in information is rich in socio-economic spheres. Scientific and technological information made the greatest impact in the post-industrial society and contributed a great deal for research and development’ (Sumati, 1999). Information is a vital ‘national resource, just as essential to a nation’s socio-economic development, well being and security as other national resources, such as water and minerals. Beyond the boundaries of a country it provides an important basis for international relations, peace, prosperity and overall global development, the wealth of intellectual, scholarly and research resources in libraries and information systems of a country is therefore one of its greatest strengths’ (Sen, 2002). Researcher uses ‘scientific information to develop research agendas, stay-up-to date with developments in their own and related research fields, work collaboratively within the campus and with colleagues throughout the world, and thus critically analyze the work of others to contribute to their research and academic activities. As the information explosion continues, scientists and researchers expect the library system to serve them from the world of resources in order to accomplish their work with the readily accessible reliable and comprehensive information’ (Uma, 2005). Research paper search engines, such as ‘Cite Seer and Cora, give researchers tremendous power and convenience in their research. They are also becoming increasingly used for recruiting and hiring decisions. Thus the information quality of such systems is of significant importance. This quality critically depends on an information extraction component that extracts meta-data, such as title, author, institution, etc., from paper headers and references, because these meta data are further used in many components applications such as field based search, author analysis, and citation
analysis’ (Peng and McCallum, 2006). Servicing the ‘Right Information to the Right user at the Right time is the goal of every Information center. The successful achievement of this goal largely depends on the tools and techniques used for the purpose. During the last few decades, there has been enormous rise in the flow of information on the one hand and greater demands for information due to accelerated Research and Development activities on the other’ (Amitabha, 1997).

6.3 **Need for Information Support:**

The full use of our scientific resources is essential if we want to win the war. This was an appeal made by 25 leading scientists in Britain at the end of the first year of the Second World War. Since then, the relationship between science and defence has been intensifying steadily.

Information is a vital resource for research and development. For carrying out research in a subject area, information on the work being done, or that has already been done elsewhere is very important to avoid repletion of R & D work to the extent possible. ‘A good deal of savings in resources and efforts can be achieved if such information is made available to scientists at the right time, in the right form’ (DESIDOC, 1990). The pile of information is increasing to such an extent that very often the search for information is like searching for a needle in a haystack. Therefore, one can well imagine the fate of scientists. Common basic function of all research libraries is to provide the resources and services to meet the research requirements of their users in the form in which they are needed and at the time when they required. In light of this purpose, the research library has a special responsibility to keep its clientele up to date and intellectually stimulated to providing pertinent literature, not only in areas of
immediate concern, but also in areas of emerging and developing importance within the scope of a particular library mission’ (Sharma, 1996).

Information ‘need is a condition in which certain information contributes to the achievement of genuine or legitimate information purpose’ (Derr, 1983). Today information is ‘considered to be the most potential ingredient in the field of Research and Development. There must not be any kind of barrier which may stand between the information and the user. And there must not be any restriction in consulting the recent developments in the field of general information regarding the entire knowledge spectra’ (Abhijit, 2002). Information retrieval systems have traditionally been the domain of librarians and information professionals. These, ‘systems have been used almost exclusively by such experts for several reasons, for example, the number of online search services available, cost and the complexity of use requiring command language searching. It was the role of the librarian to establish the user’s information needs and then use their expertise to satisfy those needs’ (Zabed et al., 2004).

Information is an important aspect for organizations. The TICs are providers of information and as vehicles for learning, and changing policy matters and implementations have recognized that readers must not be left out in the emphasis upon new technology and information services/support, ‘scientists getting their research work with great efficiencies for the development of the dimensions of the defence technologies. Which is of national concern. Information is the basic feedback for the scientists, certainly they need more attention than the ordinary users of the conventional library’ (Hemant and Prem, 2004).
The rate of growth of primary resource literature on ‘Science and Technology was that previously becoming double in every fifteen years is now doubling in every ten years and the period is coming down more and more day by day’ Bonn (1982). ‘Scientific literature is being produced at a great speed and its access has become a very important management aspect’ (Shakeel and Ahrarul, 2004).

Scientific and Technical Information can be viewed from two different, although interrelated aspects, ‘how new information is communicated to the scientific and technical community and how the individual worker searches out the information he/she wants from the many of published material’ (Lambert and Lambert, 1986). Organisation of knowledge is as old as human civilization. ‘Knowledge is growing beyond the comprehension of single individual and realized the need for its organization to understand it better and was in search of better tools to organize the knowledge’ (Muttayya, 2004), given the rapid changes in the technology and the pace of new applications ‘it is important for an organization to keep abreast of what is happening in the information system field’ (Lucas, 1989). Librarians ‘sense of professional entitlement is palpable. After all librarianship is a fundamental, discipline, affecting every dimension of human affairs’ (Melody, 1986).

The growing value of scholarly, scientific, technical and other informational and instructional documents makes it increasingly important that ‘the basic content of each document be quickly and accurately identifiable both by readers of the primary literature and by users of secondary services’ (ISO:214, 1976).

Easy and timely availability of comprehensive information catered to the specific needs of the user is the blood of R & D activities. For the successful accomplishment of the highly specialized, multidisciplinary programme, the necessity of having an
advanced IT oriented infrastructure is indisputable. The need of access to current and relevant information transcends the boundaries of the Technical Information Centres. Though many computer assisted communication technologies are available, their provisioning requires a substantial commitment of resources in terms of staff expertise, computer hardware and software training, which may not be available in TICs. Recognising the criticality of the need to access current biomedical information, established the advanced informatics center for biotechnology under Microbiology 2000 programme of the DRDO.

The proposed facility is planned to establish with the technical and professional help from ‘librarians and information technologists and subject specialists from Life Sciences laboratories of DRDO’ (Chandra et al., 2000).

The financial, technological and organizational demands on TICs are huge. They include the transition to electronic publishing, the increasing value and cost of information, new models for publishing and disseminating research, resources changing patterns of behaviour, massive growth in the value of publicly funded research, and initiatives to foster innovation and technology.

6.4 **Trends of Information Retrieval:**

Relevance is the key abstract concept in information retrieval. For effective information retrieval the system needs to retrieve the documents based on the user’s notion of relevance.

In information retrieval there are ‘three kinds of relevance judgments. i.e. 1. User’s relevance judgment on a collection of actual documents. 2. Systems relevance judgment with document representations. The last one is the user’s relevance judgment with representations of documents which are judged relevant by the system.
Considering effectiveness of information retrieval in terms of relevance judgment, the effectiveness is the extent to which the system judges the documents relevant which are judged relevant by the user.

For effective information retrieval, three things need to be effective; document representation, problem representation, and the notion of relevance. Documents need to be represented for the system to make correct relevance judgments and for the user to make correct relevance judgments. The user’s problem needs to be represented for the system to make correct relevance judgments. Relevance is the key concept for information retrieval. A notion of relevance works in the process of information retrieval. ‘Information is a vital and viable source, which is generated by experience and communicated to the destinations of the receiver. Current, technological advancements have led to tremendous changes in the process of information generation, storage, retrieval and communication. To accomplish the task of these functional components of information, new techniques and devices are used for fast operation’ (Ranjana, 2002). The enormous growth of various online bibliographic databases on World Wide Web (www)/Internet has led the library professionals to learn the diverse data structures and various search interfaces of these databases for effective information retrieval. ‘Z39.50 is a protocol, which reduces the burden of library professionals by providing one search interface for multiple databases. It also makes inter-library loan totally electronic’ (Aruna, 2001).

As electronic information resources are rising and ‘digital library initiatives are getting wide acceptance, knowledge of metadata formats will help library professionals in adapting their skills in cataloguing, classification, subject heading, key wording, and indexing for better inventory and exhaustive usage of electronic information’ (Nair and Jeevan, 2004).
In near future, libraries will operate with such simplicity that staff will receive pre-sorted materials for shelving. Shelves will be instantly scanned for setting in some specific order. Library users will be able to check materials, in and out of the library all by themselves without a librarian processing them and would find what they want almost instantly without bothering for classification system or arrangement. All this will leave library staff with more time to give personal attention to the user that is most desired and to plan and launch new programmes to support research and development activities of the organization. ‘All this, can be activated by using a new emerging technology known as Radio frequency identification (RFID) technology’ (Mehta et al., 2004).

6.5 **User Services**: Major ‘source of information for the Indian Scientists are Journals (52.37%), followed by Books (43.94%). The remaining sources such as Reports, Theses, and Dissertations and Conference/Seminar/Symposium together account for 3.72% only. The latest literature is most useful for the scientists in the field’ (Kannappanavar, 2002).

The image of library will be in direct proportion to the quality of services which it offers. In today’s fast changing scenario the intense hunt for information will increase many fold in the near future. The users will increase and will demand quality in the services offered. A library which fails to respond to the ‘new challenges thrown up by the ravages of time will lost its name, fame and users. It will stand as mute testimony to the world that those who do not keep pace with time and quality have no place in today’s fast making computer world’ (Veeranjaneyulu, 2001).
CHAPTER –7

Technical Information Centres