

## Resource Sharing Using Information Communication Technology with Knowledge Centre, ADE : A Case Study

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*The primary objective of libraries is to organize and provide access to information to its users. Most common users of a library are scientists, academicians, technical personnel, students. It is important to disseminate the research information arrived /available to the Users in addition to archived data. It is also very important that users must be aware of the various services provided by libraries. Library managers are required to send clear messages to the users that the business of library is to provide required information in the shortest possible time. In this era of information technology, attracting people to library is very difficult. Library Heads and staff should become proactive in providing and propagating the services and facilities available at the Library. Based on the interaction with many users, and analyzing their experiences, it is found that minimization of reaction time in providing the required information to the users is essential. In this paper, services and the initiatives taken by Library known as "Knowledge Centre (KC)" of Aeronautical Development Establishment (ADE) to bring awareness about the services provided by KC are presented. Information and Communication Technology (ICT) is effectively utilized by the Knowledge Centre to achieve the objective of making available information required by Scientists in time to help them to devote more time in project activities rather spending time in searching for information.*

**Keywords:** Digital Repository, E-journal, Consortium, Information Technology, Awareness, Training

### 1. Introduction

Library is an important organ of Academic Institutions, Research and Development Organizations, Industries etc. Library is a source for information both archived and current topics. Earlier, libraries used to acquire books, journals, reports of interest to the organizations based on demands from the users. Technical processing of acquisitions was carried for holding stock in the library. Circulation activities were carried out in a methodical manner. This method was more mechanical rather than skill oriented. Students and teachers used to visit library and spend sufficient time in the library in search of the topics of their interest. The users of library were in the habit of reading and making notes. Due to the advent of information technology, Xerox facilities, internet and intranet, the attraction of libraries started diminishing. Users are interested in browsing internet and websites for information rather than visiting libraries. Information technology and library software started entering the library for meeting quick requirements of the user community. The primary objective of libraries, is to organize and provide access to informa-

tion, is still the same and did not change, but the methods that were used started changing dramatically due to the influence of the technology and opening new vista of opportunities and challenges in the library management. A librarian who is aware of computer technology, communication technology, information technology can face the new and future challenges. Joseph Jestin KJ and B. Parameswari [1] concludes in their paper that an ideal librarian is one who is competitive and assertive, who is cooperative and has willingness to compromise and enthusiastic to learn new technology without being biased for any one system. Challenges to the librarians are such that they need to keep attracting the users looking in to the influence of the Internet to the users as the users are now less prone to visit the library. Thus, the librarians have got a numerous responsibility for creating IT based library services such as on-line database, Web OPAC, digital repository, e-journals and other services. In this paper various services initiated and efforts made by the Knowledge Centre to bring awareness and dissemination of information to the scientists of ADE are presented.

## 2. Knowledge Centre -ADE

The ADE Library with its parent organization was established in the year 1959. The library started functioning with about 300 books in the beginning under the name "Technical Information Centre". It became a full pledged Library with Library Professionals in about a year. ADE library started growing as per fifth law of Library Science stated by Dr. S.R. Ranganathan i.e. "The Library is a growing Organism". From August 1986, ADE library is housed in new building with the unique name called "Knowledge Centre (KC)".

KC caters to the information requirements of about 1574 Scientists, Engineers and Technical personnel of ADE and sister establishments. In addition under the intra library understanding, the centre also provides information required by libraries of NAL, LRDE, GTRE, DARE, DEBEL, CAIR, etc. It also utilizes facilities available at British Library, JRD Tata Memorial Library, Indian Institute of Science for providing information quickly to its users. Since ADE is dealing with aeronautical system, the KC collections are centered towards aeronautical sciences. The KC is having good collections of books, journals, bound volumes and technical reports. The repository of this collection consists of:

Technical books	-	25058 including 1500 Hindi books and 240 Kannada books
Bound volumes	-	14808
Journal articles	-	30163
Technical report	-	6360
CD-ROMs	-	1000
Inter library loan cards	-	58
No. of journals subscribed	-	185

The centre offers Online and CD-ROM based literature search services including access to e-journals and Web Online Public Access Catalogue (Web OPAC). The Centre is equipped with necessary infrastructure and trained manpower. KC has significantly computerized its in-house function like Cataloguing (Database), Circulation, Query, Serial Control (Journal), Setup and House Keeping activities using web enabled software LIBSUIE Windows Version 6.0. The Centre has implemented Barcode technology and automated Annual Stock Verification. Database for indexed journal articles in thrust areas has been developed and disseminating its Current Awareness Services (CAS) on a monthly basis through organization LAN to all the users. KC has introduced Smart photo ID card system for circulation functions. The Smart photo ID card will have details of member along with photograph, signature, and barcode of user ID number. The moment the card is brought in front of the barcode reader/ scanner the activities of user like borrowing and returning of publications will be displayed on the monitor. The card will be returned to the member immediately after completing the circulation functions.

### 3. Library Catalogue/ Online Public Access Catalogue/Web-OPAC

A **library catalogue** is a system of all bibliographic items available in a library. A bibliographic item can be any information entity (e.g., books, computer files, graphics, cartographic materials, etc.) that is considered as a library material (e.g., a single novel in an anthology), or a group of library materials (e.g. a trilogy), or linked from the catalog (e.g. a webpage) as far as it is relevant to the catalog and to the users of the library. The card catalogue, a familiar system to the library users for generations is now effectively replaced by the Online Public Access Catalog (OPAC). Many libraries are still keeping "card catalog" alive along with OPAC. But, it is a secondary source and seldom updated. Many libraries, those who are using card catalogue earmarks sign in the card for its identification of updation. Some libraries have eliminated their card catalog in favor of the OPAC for the purpose of saving space and maintenance of catalogue cabinet.

The OPAC available and accessible on the Web to the user community is called Web OPAC. OPACs were introduced in the USA in the late 1970s [2]. In Indian libraries OPACs were introduced in early 1980s. An OPAC provides the users online access to the library catalogue allowing them to search and retrieve records. It also shows borrower status checking, online reservation etc. Potter [3] described online catalogues as a revolutionary tool. OPAC system provides as many access points as the data elements depending on the software used. Some of the attributes for searching through OPAC are title, author, subject, keyword, accession number, ISBN etc. Truncated attributes can also be used. There are two types of searches through OPAC, first one is quick search and second is Boolean search. Quick search for a document is performed using the above described attributes. The logical operators like AND, OR, NOT are used in the Boolean search besides truncation option. In addition OPAC provides information about new arrivals, subject list etc. Types of online OPACs, their use and some of issues important to their development was studied and discussed by Raitt [7].

KC of ADE had card catalogues for information retrieval which were manually handwritten by library staff. Main card containing all the details of the publication like Classification Number, Book Number, Author, Title, Year of publication, Publisher details, Pagination, Accession Number, Subject Card, Author card were also maintained.

At present all the in-house activities of KC are automated using LIBSUITE 6.0 version software package. Gradually card catalogue is replaced and utilization of OPAC became more popular. Most of the scientists are using the Web OPAC as search tool for retrieving documents. It is very easy to handle and most of users using Web OPAC are satisfied with the System. However many users are not getting in to the complex search provided by the Web OPAC. About 30 searches are being made in a day using Web OPAC at KC.

#### **4. Library Services**

The importance of reader's services in a library needs no emphasis because it is the readers for whom a library is established and it is for the services provided readers visit the library. A library is a collection of publications kept for use. Librarianship then is a connecting link between a user and a publication. Hence the very life of a library is the personal service given to the user [4]. Information technology denotes various activities connected to location, acquisition, storage, processing and communication of information. Library automation implies the utilization of software and hardware for its various functions. Trained personnel from the People-Ware are operating system.

It is well known that there has been steady increase in cost of journals. Therefore, Library professionals have initiated several measures by way of Co-operative Acquisitions (CA), Inter-Library Loans (ILL) and Document Delivery (DD) for print media. Rapid increase in information, escalating costs, enabling technology has made the necessity of co-operation among libraries. As a result creation of digital repository and e-journal consortium are developed. In the following paragraphs various services provided by KC are explained with brief background for each of them.

##### **4.1 Inter-Library Loan Service (Resource Sharing)**

Activities involved in Research and Development Organization can not be restricted to just one area. For example - aeronautical establishment deals with areas like simulation, modeling, computational fluid dynamics etc. Books on subjects like differential equations, numerical solutions are also required. Some scientists require reports from NASA, RAND, etc. Hence it may not be possible for a library to acquire all the documents demanded by the users due to either budgetary constraints or non-availability of the documents for purchase. Therefore, sharing of information among the libraries is very important. If the

documents requested by the user are available in other libraries, then request for loaning that document for some specified period can be made. Experience of the authors indicates that our local libraries including that of NAL are very co-operative and we get required documents immediately. Concept of such sharing resources among libraries is known as Inter-Library Loan (ILL) Service. In addition, local libraries issue a few borrowers cards in the name of other organizations and scientists utilize these cards for borrowing publications and vice-versa. KC has issued borrowers cards to sister organizations in Bangalore including that of NAL and IISc Libraries. KC is also an institutional member of British Library, Bangalore.

Success of such service is due to:

1. Harmonious and friendly relationship between the personnel of libraries.
2. Immediately supplying information as per the requirements of other libraries.
3. Explaining causes for delay in supply of information.
4. Effectively communicating and send information through personal e-mail.

Main advantages of such understanding between the libraries are:

1. Scientists will get the documents within the right time.
2. Sharing of documents will reduce budgetary burden.
3. Rare or valuable documents will not be available for out right purchase.
4. Library personnel can develop mutual understanding and come to know each other.
5. Reciprocation of such facilities will be advantages to both the organizations.

Information and communication technology in the form of e-mails is effectively used to make ILL service useful for the members of KC. The time taken to get an available document from other libraries is just 4 to 5 hours.

#### **4.2 Current Awareness Service (CAS)**

Information in the field of science and technology is growing exponentially day-by-day. It is almost impossible for any scientist to scan through the literature in their field. To overcome this problem, KC is providing a proactive service called CAS. It is one of the important services provided by libraries of R & D establishments. CAS is a designed to aid research workers in keeping themselves abreast of the current developments taking place in their subjects of interest. It is also one of the several ways to create awareness among scientists about the current developments in their field.

As a part of CAS, KC is publishing a booklet known as "AERONAUTICAL LITERATURE INFORMS" every month. The booklet will contain the details of about 100 research papers published in the latest issues of Journals subscribed by KC. These research papers are searched and collected by designated Officers and Staff of KC from the latest issues of 185 Journals received during the month. Research papers are selected based on reasonable relevance to the activities of ADE. The metadata about each of the paper is listed in the booklet. In addition four to five key words are also given for easy accessing of the article from the KC database. Research papers are listed under appropriate subject heading. The softcopy of the booklet is placed in the pub data of KC.

The main objectives of this service are:

1. To save the time of Scientists, who will be busy in their project activities?
2. To give the information required by researcher in their field as quickly as possible.
3. To help those who want change in their field of research.

#### **4.3 CD/DVD-ROM Search Service**

The Compact Disc Read-Only Memory (CD-ROM) is high density optical disc in which large volume of data can be recorded. At present most of the bibliographic and full-text databases are available in CD-ROM only. Some publishers supply CD/DVD-ROMs along with the books/ journals. Based on the users request also, KC places orders for purchase of CD-ROMs. As soon as the CD-ROMs are acquired, the information is entered in library database using LIBSUITE 6.0 software. Users can search CD-ROMs for the topic of their interest.

KCs objective is to provide information to its users as per the quote "The right publication to the right person at the right time". KC procures bibliographical databases, full text/CD-ROM databases, online databases and standards like IS, ASTM, MIL Standards, on regular intervals. All the procurements are made according to procedures given in [6]. The database is updated regularly for searching bibliographic information/articles of the latest/old periodicals, reports, conference proceedings etc..

At present KC is holding 1000 CDs/DVD-ROMs on topics like Aerospace database, Ei Compendix, INSPEC which covers electrical, electronics and computer journals, total quality management, AUVSI Proceedings. In addition there are 150 video cassettes containing topics like quality control, dynamics, simulation, mechanical engineering and general science and technology.

#### **4.4 ADE Digital Repository**

Institutional Repository is the digital archive of the research output of scientists. This knowledge base covers journal articles, conference papers, technical reports, presentation/ lectures, preprints, Thesis,

images etc. One can browse the documents by author, subject, date and document type. Both simple and advanced search facilities have been provided. Scientists can submit their publications on their own by registering to the repository.

The main objectives of Institutional Repository are:

1. To provide open access to Institutional research output by self archiving it.
2. To store and preserve other Institutional assets including unpublished or otherwise easily lost literature (those of technical reports)

ADE Digital repository is a databank created by KC. It is one of the services provided to user community of ADE. The research papers published in Journals, Various National and International Conference by Scientists/ Technical Officers of ADE are stored in this repository. The information can be obtained from ADE INTRANET address <http://10.2.27.3/>. At present KC has entered 166 research papers published by Scientists of ADE to Digital Repository. All the papers can also be accessed in full text form by the Scientists of any of the DRDO labs including DESIDOC directly through DRONA.

#### 4.5 Consortia of E-Journals

Co-operation, Co-ordination and Collaboration (3Cs) might have lead to the concept of Consortium. Enormous costs involved in subscribing journals, organizing, storing space for bound volumes have made libraries to look for cost effectiveness methods to acquire information. Sharing information among the libraries is one of cost optimization; it sometimes avoids payment to the same supplier by many libraries. With ICT concept of consortium is becoming one of the important method for saving cost of collection development in library. During 2008-09, KC has saved about 10 percent of the subscription made to journals. In addition consortium will also help in saving time and manpower. Consortium helps to access special collections which are available in member libraries. The success of consortium depends on co-operation and commitment from member libraries and publishers. Some of the advantages of e-journal are legal resource sharing, remote access, offer library patrons to search and download full-text articles, provide timely access, provide multi-user access, support different searching capabilities, save physical storage [5] besides cost effectiveness. Hence, we can define consortium as an institutional alliance for resource sharing, bringing the like-minded institutions with common areas, policies and collective agenda on one platform. It is also a strategic alliance with institutions that have common interests. Consortium facilitates sharing resources and improving access to information.

ADE is a member of DRDO E-journals Consortium. About 50 laboratories across the country are members of this consortium, with DESIDOC Delhi as the nodal agency. Number of journals available in E-

journal Consortium is about 4500. All these journals can be browsed for title, subject, and publisher on internet terminals available within the establishment, because consortium information can be accessed only by the permitted IP addresses. Required articles can be searched by quick search or advanced search. By clicking on search term will go to Quick search and displays title, author, author's email and address, source and key words. In advanced search logical operators like AND, OR, NOT can be collated with the keywords to get the articles. E-journal facility allows three options to get the article. First being the down loading of the full text, second being requesting article from member library where the article is available, visit your own library if the article is available in our library is the third option. The articles are received by the requesting users within 2 days after the request is made to member library.

Creating facilities like e-journal is one side of coin. The other side of coin is creating awareness and training to the users about facilities. It was found the utility of the consortium was only 20 to 25% of the strength of the organization due to lack of awareness about the e-journals. But, those who were aware do not know how to use e-journals. For bringing awareness about the e-journals under the consortium, the authors made presentations and demonstrated about the objectives, facilities and using of e-journal consortium. After interactions with the cross sections of young scientist, it was found that around 70% of the scientists are downloading the articles that increased the usage of e-journals tremendously (see next paragraph).

#### 4.5.1 Random Sample Survey of e-journal Consortia

To find opinion of users about e-journals consortium, random survey was conducted. A questionnaire was given to fifty scientists around the age of 40 years and asked them to answer the questions on the spot, without giving much time. It was found that 73% percent of scientists are downloading research papers from e-journals consortium only after KC conducted awareness program and demonstration about e-journals available under the consortium. Newly joined scientists constituting about 8% wanted KC to arrange demonstrations again. Still 19% of the scientists are either not aware or aware but not using the e-journals services.

The following comments made by some of the scientists on e-journals consortium, are worth mentioning:

1. Information is on finger tips.
2. Good demonstration and useful for beginners.
3. The resources are extensive and useful.
4. A very useful source of technical information.

5. The e-journals consortium is a handy tool for referring and downloading all the required literature.
6. Please arrange demonstrations about e-journals consortium at regular intervals.

#### 5. New Generation Digital Library

Integrating all the services provided by KC is essential to establish a new generation digital library for the benefit of ADE scientists. Resources, Technology and Services form the three essential factors for the development of such a library. It is essential to integrate Resources, Services and Information together to meet the diverse demands of users. The new generation digital library must penetrate into process of the information usage. It may establish the service mechanism which satisfies users need by linking, integrating and inserting resources and services and may provide knowledge service to meet the users' demands by analyzing, reorganizing, innovating, integrating and applying information. This kind of mechanism may be manifested for the essential requests of knowledge service closely [8]. The digital library may build harmonious atmosphere for knowledge service and may push for the realization of knowledge services and help in realization of projects in time.

#### 6. Conclusions

1. Web-OPAC module of LIBSUITE 6.0 is available at six terminals connected to KC intranet. Based on the data collected in regular intervals, it is observed that on average of 30 scientists per day are searching information on the topics of their interest.
2. It is very important to strengthen ILL services for resource sharing. ILL helps to get rare documents available at other libraries, which are otherwise not available for purchase/out of print. ILL reduces the budgetary requirements. ILL also helps in developing harmonious relationship between the personnel of different libraries.
3. CAS provided to the scientist by the KC is helpful in saving the time of the researchers. The time saved by the scientist is being used for the other projects. Suggestion to include two to three lines of abstract on the research papers in the CAS publication is under consideration.
4. Digital Repository of research papers helps to understand the research work being performed by other sister organization. It avoids duplication of research activities and also leads towards cooperation and understanding among organizations of common interest.
5. Work in Libraries necessitates Collaboration and Co-operation which helps in success of digitization initiatives. E-journal consortium is an example of such co-operation among the libraries of

DRDO organization. Digital collections of the member libraries can be effectively shared. This is a welcome step taken by the New Delhi office. The success of consortium depends on delivery methods, formats, pricing models, technological and legal implications. Successful consortium requires time to develop, high level trust among the members, willingness to contribute, sufficient funds with skilled Coordinator.

6. It is also observed that mere creation of digital collection and consortium will not serve the purpose, unless awareness and training programs are conducted to various levels of users. In this direction KC achieved significant success in utilizing the e-journals that has increased from 20% to 73%.
7. It can be concluded that user awareness of the library services to the members of the library is very important and must for the success of the service. It is also important to have regular feedback from the users for continuous improvement in the library services.
8. Every library should be developed in the line of digital library. The challenges are to choose the right technology and the will to implement it.
9. Finally, it is concluded that ICT is playing major role in library services and resource sharing of library resources among member libraries.

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