# Design and Development of a Model for Resource Sharing in a Network Environment: a case study of DRDO Union Catalogue of Books

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**Abstract:**  The purpose of this working paper is to describe the model of Union databases of information resources  in a networked environment. This model is based on the case study of DRDO Union Catalogue of Books designed and developed by DESIDOC for  DRDO libraries located across India. Initiatives are taken to provide a central platform to host the metadata of various information resources and make it accessible to entire DRDO community across the country. This paper discusses in detail about the design and development of DRDO Union Catalogue of Books and also talks about methodology adapted, its maintenance procedures and finally how it will be made available to the end user using DRDO INTRANET platform. The article describes the workflow of maintaining Union databases and the steps involved are discussed. Main emphasis is given to ensure that the searching of database is user friendly and the user is able to go automatically to the document supply system with a single click of the mouse button. This model is highly effective for the big R&D organizations where labs/establishment of the organizations are spread over the big geographical area and resources are unique in each of these unit.

**Keywords:** Union Catalogue, DRDO, Resource sharing, DESIDOC, Intranet

## 1.  Introduction:

DRDO is a premier organization of India working in the field of Defence R&D. More than 50 Labs/Estts of DRDO are dedicated to various S&T disciplines.  Most of the DRDO Labs/Estts have a very rich collection of S &T literature which are available in the form of books, reports, patents, standards, conference proceedings, reference collections etc. These resources are very useful for the Scientists and Researchers of DRDO for fulfilling their information needs in the area of their R&D activity. To maximize the use of acquired resources there was an urgent requirement to develop a Web based Union catalogue of book  resources which would enlist the bibliographic details of all the books of DRDO member libraries and make them accessible online through INTRANET. DESIDOC being a premier R&D organization Under DRDO acts as a central resource for providing S&T information to DRDO R&D community, has taken an initiative to design and develop a Union Catalogue of books of DRDO member libraries held on charge.

The DRDO Union Catalogue of Books, contains records from multiple sources and formats being converted into a single format. Put simply this union catalogue contains bibliographic description for , books available in DRDO member libraries. It integrates a group of individual catalogues and provides locations. It serves as a document supply mechanism for different types of material owned by the participating member libraries that is the key to resource sharing among member libraries. At the same time it functions as a central pool of data, which can be used for collection development and document supply.

## 2. Objective:

The objective of this project as stated above is to develop Union Catalogue of Books of DRDO member libraries held on charge.

## 3. Purpose:

➢ It will enable a user to know about the availability of a particular book in a DRDO member library along with its location.
➢ Will facilitate the resource sharing amongst DRDO member libraries through inter-library lending.
➢ Further it will help to avoid undesired duplicate procurement of books.

## 4. Methodology:

The first step to develop Union Catalogue is the collection of bibliographic information in an appropriate format consisting of various mandatory and optional bibliographic data elements or metadata of the book. The records were received in any of the following formats practiced by the particular member library of DRDO Labs/Estts.

- CCF /MARC format
- Photocopy of Accession Register.
- Print out list of holdings if any Library automation Software is used.
- Softcopy of any DBMS Used for creating records.

The collection of records of books data has been a herculean task. However with our sincere efforts we have been able to collect data from 47 labs as shown in the table.

The detailed breakup of data is also shown in the following table:

| S.No. | Software Used | No.of Labs. | No. Of Records |
|-------|---------------|-------------|----------------|
| 1 | SLIM 21 | 1 | 7896 |
| 2 | Libsys | 8 | 1,50,000 |
| 3 | Delas | 7 | 1,14780 |
| 4 | Libsuite | 3 | 4454 |
| 5 | Total IT Solution | 1 | 1308 |
| 6 | E-Granthalaya | 1 | 6086 |
| 7 | Suchika | 3 | 13516 |
| 8 | Librarian | 1 | 693 |
| 9 | KIMD | 1 | 63,437 |
| 10 | In-House Built | 3 | 3582 |
| 11 | Pdf,Excel,Word,Text | 13 | 70,000 |
| 12 | Acc Register | 5 | 77,745 |
| | **Total No.of Records** | **47** | **5.13,497** |

## 5. Analysis of Data :

As Most of the member libraries of DRDO Labs/Estts are using different Library Management Software as depicted in the above table, it was very difficult to extract the data, more over due lack of consistency in rendering the bibliographical description and standard

cataloguing rules , it was very difficult to bring all the records to a common format .Some of the common problems which we have been facing are :-

- Heterogeneous composition of records i.e. the database contains all types of records.
- Most of the Labs. are maintaining common register for books, journals etc.
- Missing accession numbers.
- Typographical errors in most of the records.
- Lack of indexing.

## 6. Designing UCB Software:

Since the Union Catalogue serves various specific functions different from a normal Library management software, it was decided to develop it through outside software firm . Finally the job of development of the software was given to M/s Real Time Technical Solutions based in Bangalore which strictly adhered to software requirement specifications (SRS) provided by DESIDOC team. Some of the major points of SRS are:-

- Provide admin/super admin rights for data security.
- Provide real time synchronization with databases located in member libraries.
- Downloading of searched records according to MARC 21 standards ..
- Enabling range selection for merging of records.
- Facilitating Editing of records.
- Facilitating retro-conversion of records from participating member libraries.
- Checking duplicate records while merging.
- Searching in all important fields (title, author, place, publisher, ISBN, year and key words) etc
- Generating an ILL request.
- Displaying of location of searched records.
- Efficiency in the search term with user friendly help messages.
- Provision for advanced search.
- Navigation of records with various display formats.
- All the databases are on one server.
- The records statistics .
- Export records in MARC/CCF format.
- Help message.
- Custom connectors .
- Access to unlimited users via DRDO intranet.

The firm has developed a software with following features:

Software-Exalead
Plateform-Linux
Frontend-Java
Backend-Mysql

### 6.1.     Infrastructure

As the job involves inputting a huge volume of inputting bibliographic information, maintenance of backup, fast processing, validation etc. The following infrastructure facility has been provided.

### Hardware

**Client:-**

1. Computers        -        3 High end computers
2. Back up Media    -        2 Minimum 1TB storage capacity

**Sever:** A state of the art server with latest configuration has been provided by DESIDOC,s Networking Division for hosting UCB software.

## 7.  Workflow to Build Union Database:

DESIDOC is managing a central hub for maintaining Union Catalogue and in many ways a centralized catalogue is less likely to produce duplicate records. If duplicate records do occur during the searching this would not affect the success of the retrieval programme. However, in reality, users tend to examine only those records appearing in the first one or two pages of the results screen. Thus the problem is that duplication adds "noise" and reduces the number of relevant items as output.

The creation of the Union catalogue comprises of the following steps, these are:

- Because of different software being used and because of the unavailability of proper guidelines with the software packages, the rendering of bibliographic information with items in their respective fields such as author, publisher, series, edition etc. lack consistency . Therefore, the records are imported in UCB software through inbuilt connectors (Figure 1) , these records are   stored in the temporary database of the software (Figure 2). Where ever the records are received as accession registers , manual retro-conversion is carried out using the cataloguing module integrated with the UCB software. The temp OPAC module provides facility to edit the records wherever necessary.
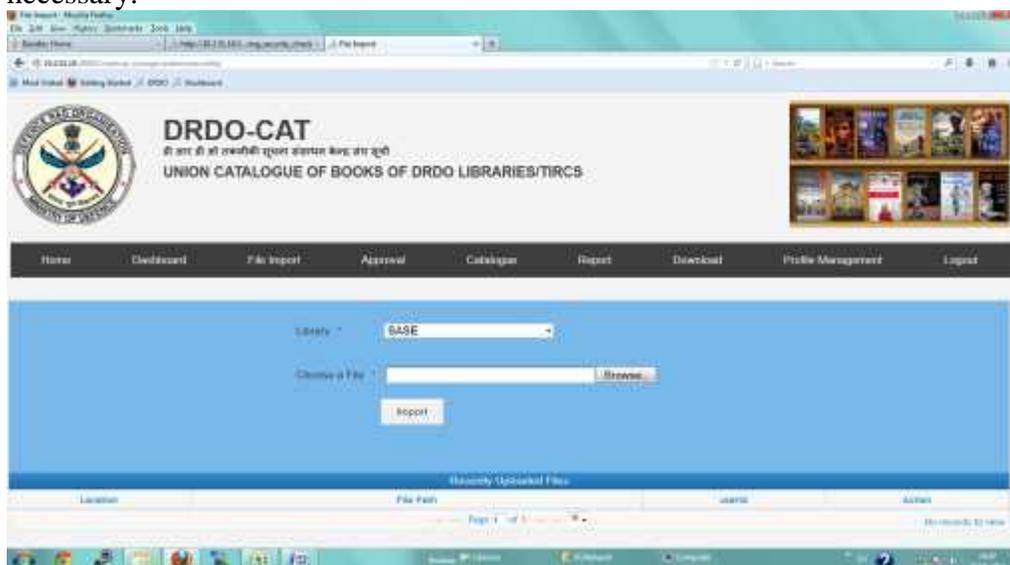
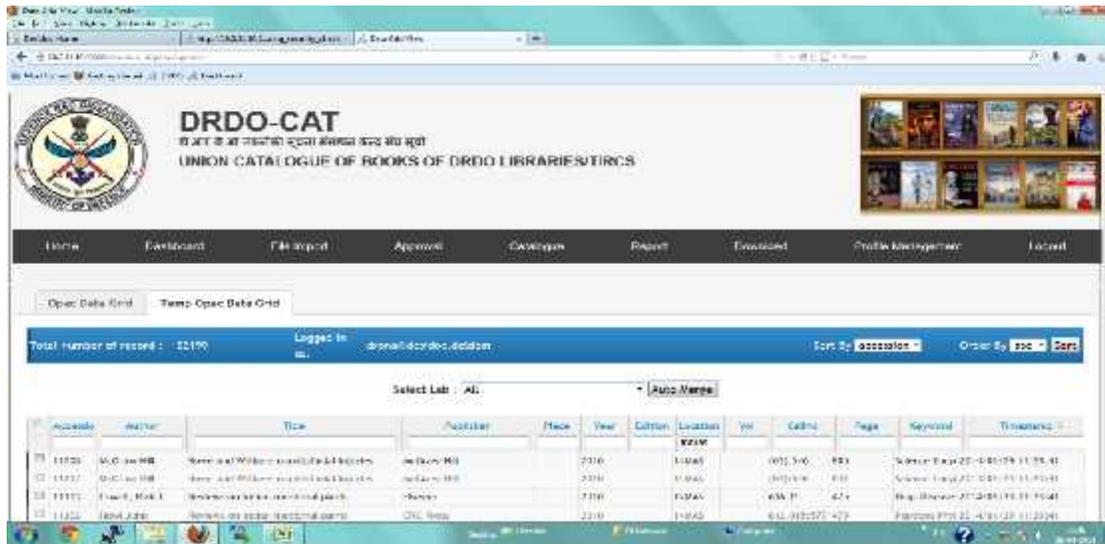*Figure 1: Importing records in Temp UCB Database*



*Figure 2: Records in Temp UCB Database Grid*

- After the manual modification of received records the records are approved for merging with the main database. The merging of the records can be both automatic as well as manual . If manual merging is required the records can be selected In range of 10,100,or 500. The software takes care of duplicate records before merging with the main database in order to avoid redundancy Figure 3.
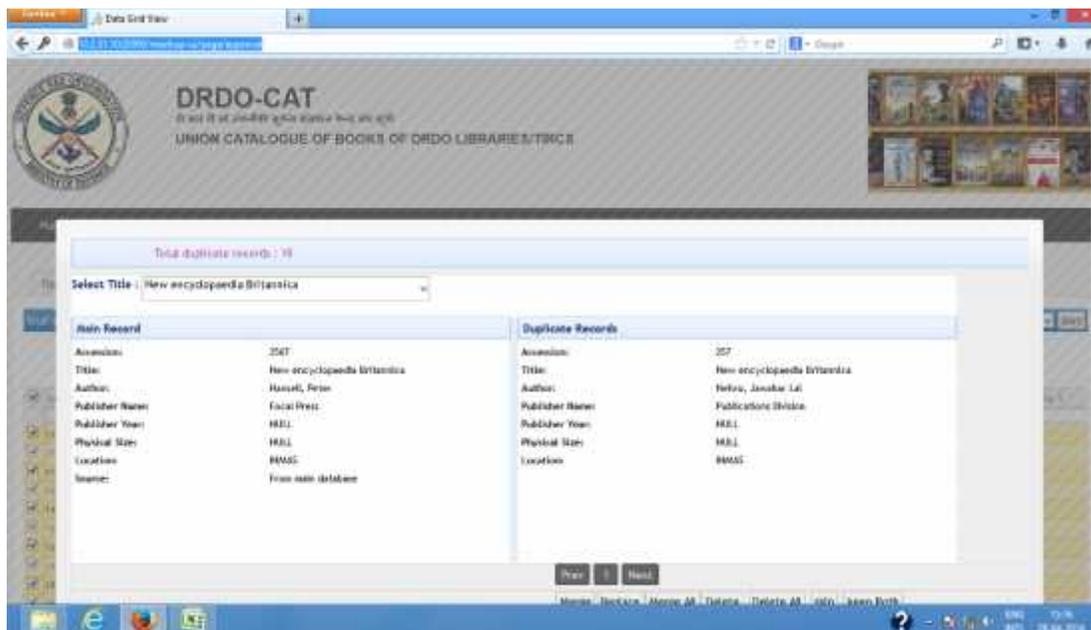


*Figure 3 :Duplicate Comparison of Records*

## 8. Merging with Central Server:

The final record is added to the union catalogue. This phase deals with the user interface to the database.  Here provision is also made to edit the records if any mistake or error can be found in the output. This phase is specifically dealing with searching of the records. Figure 4  illustrates the work flow:
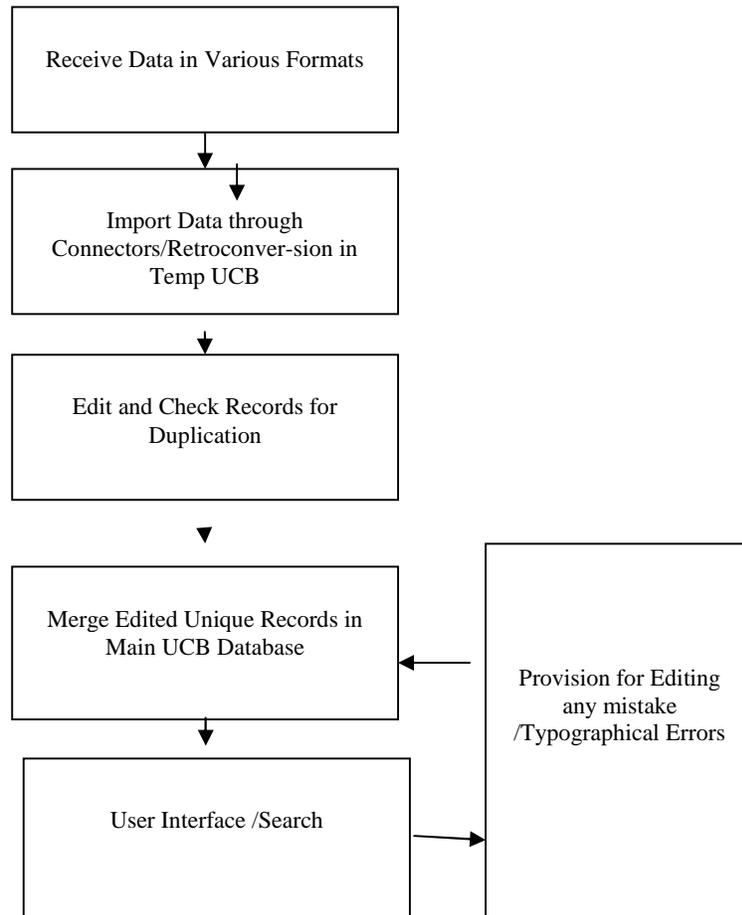
Receive Data in Various Formats

Import Data through Connectors/Retroconver-sion in Temp UCB

Edit and Check Records for Duplication

Merge Edited Unique Records in Main UCB Database

Provision for Editing any mistake /Typographical Errors

User Interface /Search

*Figure 4: Creation of Union Catalogue for books at DESIDOC – workflow chart*

### 8.1.    Searching For Records:

Searching is the process of retrieving bibliographic records from a database. As shown in Figure 1, database can be searched from the chosen site. All the databases are linked from the main web page. Bibliographic information about an item is entered in a search statement at an appropriate place and sent to the system. The system matches this information in the union catalogue and displays the search results, which are given at Figure 5.
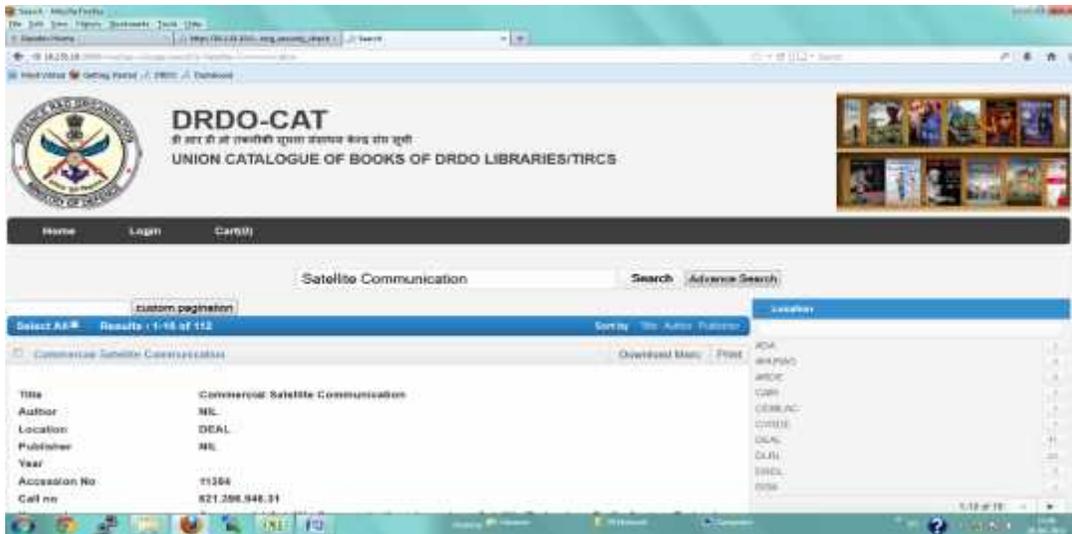
*Figure 5 :Display of Records*

The system will list the results with default display fields and link the title to location information (Figure 6). On clicking the title, the system will display the detailed information about the title and its availability. Clicking on the location information, will display detailed information of the contact person with a full address.
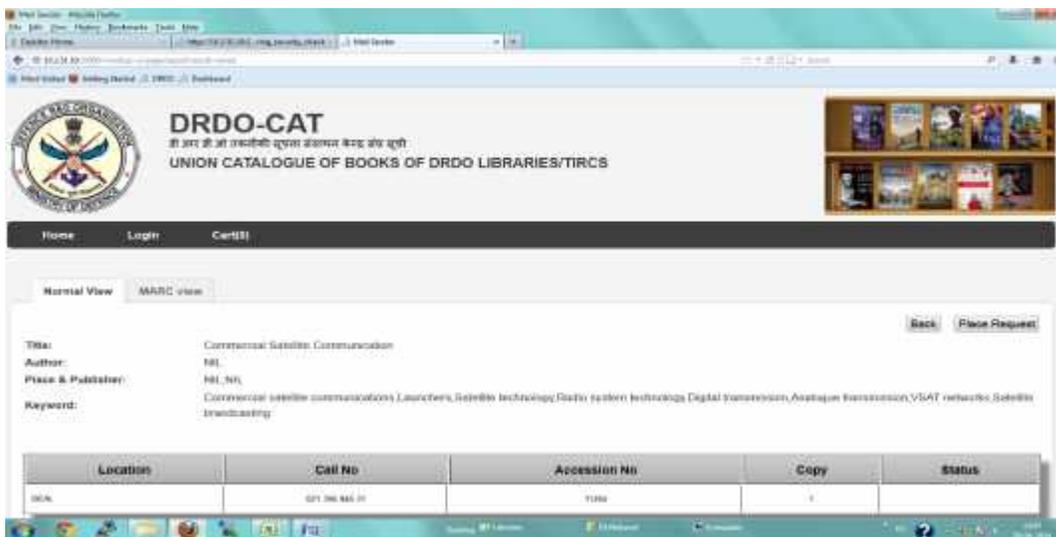


*Figure 6 :Display of records with location information*

## 8.2. Save or Download

The system has a provision to save files in various formats.These saved records can be loaded onto a local system, which is known as copy cataloguing. Records from individual libraries can also be downloaded (Figure 7)



*Figure 7 :Saving of Records from Labs*

## 8.3. Request For Document Supply

The union catalogue search enables the user to send a document supply request via INTRANET. Thus to improve user satisfaction and library services, libraries can create a webbased document supply service; which can be sent direct to the end user. After performing the search, users can find the location and send an email for a document supply request to the librarian ( Figures 8 and 9).
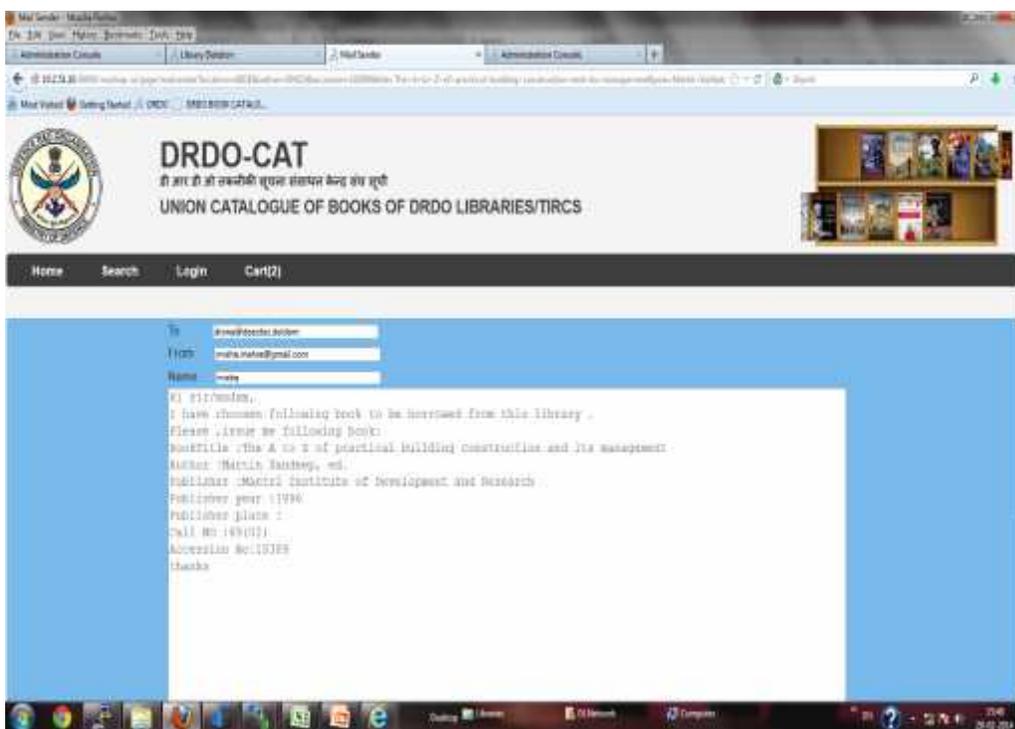


*Figure 8 :Request for ILL*

*Figure 9 :Request for ILL(sending e-mails)*

## 9. Status Of The Project

Till date 47 member libraries of DRDO Labs./Estts are participating and more than four lac records are available in the central server of DESIDOC.

## 10. Conclusion:

Union catalogue is an important tool for resource sharing and knowledge management in any R&D organisation as research is interdisciplinary in nature. Its significance becomes more crucial when the R&D organisation is very big and consists of large number of laboratories/establishments/units which are scattered geographically across the country like DRDO and research and development activities are diversified and spread over a big spectrum of subject disciplines. In this scenario each laboratory can build up the core collection of its core areas of work/projects however for related subject disciplines they can approach their sister laboratories/units to share the resources to fulfil their information needs. The development of a Union catalogue in this environment is a crucial requirement which demands high level collaboration from member libraries. The present model is a logical solution which provides a central platform to share the information resources with remote users. The logical function of any union catalogue is resource sharing and document supply and it is high time that member libraries make use of such central databases in order to initiate such services. To achieve organisational as well as individual goals member libraries are required to share their data in real time and adhere to the guidelines and data sharing policies of the organisation. This model may serve as bench mark for other similar R&D organisations to network their information resources and make them available on a central platform for remote access.

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