AUTOMATED CIRCULATION SYSTEM USING CLIPPER

The paper discusses the salient features of an automated circulation system, designed and developed to suit the requirements of a medium sized academic library using the software CLIPPER, a DBMS compiler. All the procedures designed to perform various functions are menu-driven and have the provision of on-line help.

In this package documents are broadly classified under books and serials. And membership is categorized into four types each having a distinct borrowing capacity, as shown below:

<table>
<thead>
<tr>
<th>User Type</th>
<th>Book Capacity</th>
<th>Serial Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>'T' (Teachers)</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>'R' (Research Scholars)</td>
<td>10</td>
<td>03</td>
</tr>
<tr>
<td>'S' (Students)</td>
<td>04</td>
<td>01</td>
</tr>
<tr>
<td>'N' (Non-Teaching)</td>
<td>02</td>
<td>01</td>
</tr>
</tbody>
</table>

As far as fines are concerned, it is uniform to all four types of users.

SOFTWARE

Clipper is a DBMS compiler and is published by Nantucket Inc. This developed package is based on summer '87 version. The features of clipper are:

- CLIPPER development environments are self-contained.
- The provision of Arrays which are memory based data tables that can be created and used to speed up programs.
- The facility of providing context sensitive helps.
- The user-defined functions which can be called as if they are built in.
- The facility to open 255 files.

MINIMUM REQUIREMENTS

The following are required to operate the package:

a) An IBM PC or a true compatible.
b) MS-DOS version 2.0 or higher
c) At least 640 KB of RAM
d) dBASE III Plus (optional)

OBJECTIVES

A computerised circulation system requires a database comprising of the documents, members and daily transactions record. The information generated is basically of three types.

1. Information about the members who borrow the collection which includes member's name, identification number, department, occupation, address for communication, date of registration, capacity to borrow books and serials etc.

2. Bibliographic information about collection to be borrowed includes Acc. No., Call No., Author, Title, Place, Publisher, Year etc.

3. Information about document transaction which includes date of issue, due date, membership no, member name, etc.
DIFFERENT TYPES OF FILES

In order to meet the above objectives, seven files have been created. They are:

01. Books. dbf
02. Serial. dbf
03. Members. dbf
04. Bootran. dbf
05. Seritran. dbf
06. Control. dbf
07. Reserve. dbf

The database of books and serials are created to store details of the above documents by inventory system. The member file stores all the details of members. Bootran and Seritran databases, the most important files store records for all the transaction details. Reservation details are stored in the reserve file. The control file is created to generate numbers for the numeric part of membership number automatically.

Circulation Process

The software can be loaded in the hard disk by typing `load` which will create a directory named `clip on` that drives and loads the package into it. The software can be executed by typing `RAM`. The main menu has four options (fig 1), which are discussed below:

![Fig. 1: Main menu](image)

1. Circulation

   The circulation option is designed to perform the following functions.

   a) recording the issue and return of books and serials to members.

   b) generation of reminders to borrowers with overdue books and serials.

   c) calculation of fines for overdue books andserials.

   d) issuing of no-dues certificate to non-members/members whose membership is cancelled.

   e) acceptance of reservation for books/serials.

   f) displaying the list of books and serials by their titles borrowed by a particular member and along with their borrowing status.

On selecting this option, a sub-menu of five options appear on the screen (fig 1.1)
1.1 Charge

The charge option again has a sub menu of books and serials. If books is selected, the charging sheet is displayed on the screen prompting for member no. When it is entered, the system will display the member name and borrowing status. If borrowing capacity is not exhausted, the accession number can be entered to record the issue of the item, otherwise a message will appear on the screen.

**Sorry !!! your quota is over**

<table>
<thead>
<tr>
<th>CIRCULATION</th>
<th>MEMBERS</th>
<th>DOCUMENT</th>
<th>STATISTICS</th>
<th>QUIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHARGING</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DISCHARGING</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BROWSING</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REMINDERS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RESERVE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Fig. 1.1: Circulation menu**

1.2 Discharge

The screen output for discharging books is shown in fig.1.3 It has also two options viz. books and serials.

While recording the return of books, the procedure verifies the due date. If it is greater than due date, the amount of fine to be paid by the members is displayed and the print out of receipt can be taken. The number of days for fine calculation excludes holidays and sundays as well.

During charging and discharging process, there is little scope for manipulating the dates of issue and return.

<table>
<thead>
<tr>
<th>CHARGING SHEET</th>
</tr>
</thead>
<tbody>
<tr>
<td>USERNO</td>
</tr>
<tr>
<td>ACC. NO.</td>
</tr>
<tr>
<td>AUTHOR</td>
</tr>
<tr>
<td>TITLE</td>
</tr>
<tr>
<td>DATE OF ISSUE</td>
</tr>
<tr>
<td>BCARD</td>
</tr>
<tr>
<td>DISCIPLINE</td>
</tr>
</tbody>
</table>

**Fig. 1.2: Charging sheet**
1.3 Reserve

This option takes care of reservation of books and serials by members. The reservation form will seek the membership number and accession number of the item. The other details viz. Membername, Call No., Title and date of reservation are automatically displayed on the screen. Before making reservations for a book, the reserve file will be verified to know the reservations already made for the same item with the help of serial number, to assign the order of priority. The reservation form is shown in fig. 1.4.

![Discharging Sheet](image)

**Fig. 1.3:** Discharging sheet

1.5. Browse

The Browse programme facilitates the browsing of books and serials issued to members by their titles and displays their borrowing status. When a member no. is entered, the displayed screen is as at fig 1.5. It has two options, books and serials.

![Reservation Sheet](image)

**Fig. 1.4:** Reservation sheet
2. Members

The members menu (fig.2) is designed to grant membership, cancel membership and issue no-dues certificate. In other words, it performs the following functions:

a) Registration of members
b) Cancellation of membership
v) Issuing no-dues certificate

This menu has three options viz. Regist, Browse, Cancel.

2.1 Regist

Before adding a new member, the member database is checked to ensure if that person is already a member. Each member is prefixed with an alphabet and a number which is automatically generated by the control file. This automatic generation of member number relieves the burden of checking the number assigned to the last member registered. The alphabetic part of member number is also for identifying the category. In order to prevent the unauthorized use of this option a password has to be typed along with the person's name who is authorized to use it.
The alphabetic part of member number has to be only of four types T - Teaching Staff, R - Research Scholars, S - Students, N - Non-Teaching. The program is designed not to accept any other alphabet other than the above four.

2.2 Browse

The browse option is designed to browse various details of the members. All the fields of the record are displayed on the screen on entering the member number.

2.3. Cancel

This option is designed to cancel membership. This programme requires a password and user's name to operate. A hard copy of no-dues certificates can be taken if required through this option.

3. Documents

The document option is designed to maintain the database of books and serials by inventory system. The following functions are assigned to this option.

a) Addition of new arrivals of books and serials databases.

b) Deletion of records of weeded out books.

c) Browsing of records by author, title and call number to answer queries on availability of books and serials.
d) Editing of records in case of change with regard to call no.

The document has a sub-menu of books and serials, each of these two have again been assigned four options viz. Add, Browse, Edit and Delete.

3.1. Add

The Add program will add the new arrivals of books and serials to these databases which are available for loan.

3.2. Browse

The browsing program is designed to answer queries on availability of books and serials. The provision of arrays in CLIPPER facilitates the designing of on-line help with all three access points. When the access point author is selected, the invoking of the function key (F1) displays the list of authors (alphabetically) on the screen along with the title of the books, out of which, the desired ones can be selected by pressing the return key. The other details are automatically displayed on the screen including its availability. The browsing program of serials has also three access points namely serial no., title and subject.

<table>
<thead>
<tr>
<th>ADD MENU FOR BOOKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC. NO.</td>
</tr>
<tr>
<td>AUTHOR</td>
</tr>
<tr>
<td>TITLE</td>
</tr>
<tr>
<td>PLACE</td>
</tr>
<tr>
<td>PUBLISHER</td>
</tr>
<tr>
<td>YEAR</td>
</tr>
<tr>
<td>DISCIPLINE</td>
</tr>
</tbody>
</table>

Fig. 3.2 : Add menu

3.3. Edit

The edit option allows the change of fields viz. call no. of the book, if there are any changes.

3.4. Delete

The delete option is also restricted to authorized persons who can operate it by typing and the required password and their name. This program will delete all such records of the books in the database, which the management decides to weed out. In case of serials, the volume of issues which are sent for binding are deleted in the serials database.

4. Statistics

Statistics of various operations are necessary for decision making. For instance, the data on the number of books available in all the disciplines will reflect the strengths and weakness in the collection. The reservation statistics will help in knowing the demand for a particular item, so that more copies of such items can be procured to meet the demand.

This menu has five options.

4.1. Books

This menu has again two options.

4.1.1. Bookstat

This option will show the total number of books available in the library on a particular or given date.
4.1.2. Bookdstat

The number of books available in a particular discipline on a given date will be displayed on selecting this option.

4.2. Serials

This has two options.

4.2.1. Seristat

This option will show the total number of serials subscribed by the library in all disciplines on a given date.

4.2.2. Seridstat

The number of serials subscribed in a particular discipline on a given date will be shown by this option.

4.3. Current Status

It has two options.

4.3.1. Charstat

The charstart option will reveal the total number of books issued on a particular day.

4.3.2. Chadstat

This option will show the number of books issued on a particular discipline on a given date. Similarly the number of serials issued on a particular date, as well as the number of serials issued in a particular discipline can also be displayed on the screen by Charstat and Chadstat options.

4.4. Memstat

The memberstat option will display the number of members in each category.

4.5. Resestat

The resestat displays the list of all such items on the screen which are reserved by three or more than three members on any item. These statistics will indicate the items which are in demand.

5. Quit

After the day’s transaction, on selecting the quit option the program allows to take backup, restore, reindex and copying of all database files on a floppy disk in event of any malfunction or system’s failure.
ADVANTAGES

This CLIPPER based circulation system has the following advantages:

(i) Member's query on the availability of books can be answered quickly.

(ii) Browsing of books and serials by multiple access points through on-line helps facilitate the members in identifying the books on their topic of interest available in the library.

(iii) Certain operations like, registration, cancellation of membership, weeding out of books by deletion, charging and discharging have restricted access in order to prevent any malpractices.

(iv) The inventory system of maintaining the database of books and serials helps the members in identifying the documents available in the collection of library on their topic of interest.

(v) The statistical data on issues can help in analysing the adequacy of collection subjectwise.

(vi) The statistical data in reservation of books and serials may help in procuring more copies of such items.

(vii) The data on number of books available in each discipline may facilitate in knowing the adequacy of collection in each discipline and formulating a judicious acquisition policy in the library.

(viii) Above all, effective utilization of staff is possible by analysing the statistics of work load.

The output of almost all functions are given in the appendix in order to understand the package properly.

REFERENCES


2. PALANIYANDY (M V) and RAVICHANDRA RAO (I K): Automated circulation control system. Library Science with a slant to Documentation. 29, 4; 1992.


5. GOWRI (R) and YADUMANI: Automation of Library circulation in computer application to libraries, IR & Networking. Ed. by S. Parthasarathy.

FLOW CHART SHOWING DEVELOPMENT CYCLE IN CLIPPER
FLOW CHART OF MAIN MENU

START

READ CH

CH = 1

MENU 1

CH = 2

CH = 3

MENU 2

CH = 4

N

MENU 3

MENU 4

STOP

(C) SASIKALA, (K) RAMA PATNAIK and (K) SOMASEKHIRA RAO
FLOW CHART OF CIRCULATION MENU
FLOW CHART OF SUBMENU OF (BOOKS)
DOCUMENT MENU
FLOW CHART OF SUBMENU OF (SERIALS) DOCUMENT MENU
FLOW CHART OF STATISTICS MENU
AUTOMATED CIRCULATION SYSTEM USING CLIPPER

FLOW CHART OF CHARGING PROGRAM
DISCHARGE

ACCEPT ACC. NO.

READ 'DETAILS' FROM TRANFILE

CURRENT DATE > DUE DATE

YES

CALCULATE FINE

DELETE FROM TRAN FILE

EXIT

FINES

DAYS = CURRENT - DUE DATE

DATE > 60

YES

FINE = COST OF BOOK

NO

DAY'S > 30

YES

FINE = 10.00

NO

FINE = 10 X days

EXIT

CHART OF DISCHARGING PROGRAM

FLOW CHART SHOWING CALCULATION OF FINES
AUTOMATED CIRCULATION SYSTEM USING CLIPPER

FLOW CHART OF RESERVATION PROGRAM