AUTOMATED CIRCULATION SYSTEM USING VISUAL BASIC 6.0

The paper discusses the salient features of an automated circulation system, designed and developed to suit the requirements of a medium sized library using the programming language Visual Basic.

VISUAL BASIC

Visual Basic is an ideal programming language for developing sophisticated professional applications for Microsoft Windows. It makes use of Graphical User Interface (GUI) for creating robust and powerful applications. The graphical user interface as the name suggests, uses illustrations in text, which enable users to interact with an application. This feature makes it easier to comprehend things in a quicker and easier way.

Coding in GUI environment is quite a transition from traditional linear programming methods where the user is guided through a linear path of execution and is limited to a small set of operations. In a GUI environment, the number of options open to the user are much greater, allowing more freedom to both the user and the developer. Features such as easier comprehension, user-friendliness, faster application development and many other aspects such as introduction of Internet features make Visual Basic an interesting tool to work with.

Visual Basic was developed from the BASIC programming language. In 1970s, Microsoft got it started by developing ROM-based interpreted BASIC for the early microprocessor based computers. In 1982, Microsoft Quick Basic revolutionized Basic and legitonized as a serious development language for MS-DOS environment. Later on, Microsoft Corporation created the enhanced version of BASIC called Visual Basic for windows.

The proposed automated circulation system is developed in Visual Basic 6.0 version and for database Oracle 7.3 is used as back end. The system is designed and developed to suit the requirements of a medium sized library.

MINIMUM REQUIREMENTS

The following are required to operate the package:
- Pentium Computer
- Microsoft Windows 95 or Windows NT
- Oracle 7.3 (as back end)
- Atleast 16MB RAM
- Visual Basic 6.0 version
- Mouse

OBJECTIVES

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

a) Information about the members who borrow from the collection which includes identity number, member name, parent name, designation, date of birth, address for communication, joining date, closing date, number of cards, etc.

b) Bibliographic information about collection

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being borrowed includes book number, book title, author, publisher, subject, section, price, date, etc.

c) Information about document transaction which includes identity number (member), transact number, book number, title, issue date, return date, renewal date, fine, number of renewals, etc.

DIFFERENT TYPES OF FILES

In order to meet the above objectives, three files have been created in Oracle 7.3. This is as back end. They are:

(i) Books

(ii) Members

(iii) Transact

The database of books is created to store details of all the documents available in the library. The member file stores the various details of members. Lastly, the transact file is a very important database that stores records for all transaction details.

CIRCULATION PROCESS

The circulation process involves the book form, members form and transaction form.

Books Form

The books form is designed to maintain the database of books and serials (Fig. 1). The following functions are assigned to this option.

- Addition of new arrivals of books and serials databases
- Deletion of records of weeded out books
- Modification of records in case of changes with regard to any item in this form, and
- Fetching of records by book number and authors to answer queries on availability of books

Add New Record

In books form click on the add new record push button and add the new arrivals of books and serials to these databases which are available for loan.

Fetch

This button is designed to answer queries on availability of books. Click on fetch button, it shows input box as below:

<table>
<thead>
<tr>
<th>Input book number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enter any book number</td>
</tr>
</tbody>
</table>

If the given book number is in the list of books, it shows the message 'Query is successfully completed'. If not found 'Book Number not found' message will be shown.

Like book number, author, title, queries also appears on the screen.

Modify

The modify button allows the change of the fields of the books form.

Delete

The delete button is restricted to authorised persons who can operate it by typing the required password and their name. Click on delete button deletes all such records of the books in the database which the management decides to weed out.

Apart from these add new record, fetch, delete, modify buttons, navigation buttons are also available in this form. The navigation buttons will help to see the records like first, previous, next and last.
The members form is designed to register membership, delete membership etc. It performs the following functions:

a) Registration of members by clicking on add new button,
b) Cancellation of membership with delete button,
c) To change any fields in this form by using modify button, and
d) Searching of records on identity number to answer queries on membership details.

Identity number of members is automatically generated in this form. This automatic generation of member number relieves the burden of checking the number assigned to the last member registered.

**Search**

The search button is designed to search identity number whenever any identity number is to be checked or to know details of that particular number. On giving a specific number, it displays the details of the particular identity number of member.

By clicking on this search button, it shows an input box like below:

![Enter Identity Number]

**Add New Record**

This button is used for adding new members. Before adding a new member, the member database is checked to ensure if a person is already a member.
If a given identity number is available in the records, it displays the other details of that member. If given number is not found, it gives a message “Record is not found”.

**Modify**

Modify button is used to change the records or to edit the records in whatever way it is required.

**Delete**

This button is designed to cancel membership or to delete the particular member details from the list. By clicking on this button, it shows confirmation message box.

![Member creation form](image)

Fig. 2: Member creation form
AUTOMATED CIRCULATION SYSTEM USING VISUAL BASIC 6.0

Transaction Form (Circulation Form)

As seen in Fig. 3, this form is designed to perform the following functions:

a) recording the issue and return of books and serials to members,  
b) renewal details,  
c) calculation of fines for overdue books,  
d) displaying the list of books by their title borrowed by a particular member and with their transact number, transact status, and  
e) close the membership

Issue

Issues are also referred to as charge. By clicking on this button, it shows a box like.

Give Id number of member and click OK button. If member status is open the message box will appear like below:

<table>
<thead>
<tr>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record is found. Issue a book!</td>
</tr>
</tbody>
</table>

If the member status is close, the message box will appear like this,

<table>
<thead>
<tr>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record is found. But no cards to issue a book</td>
</tr>
</tbody>
</table>

Fig. 3 : Transaction form
If given Id-number of member is not in the list "Record not found" message will be displayed.

In this form, by using the issue button the book-no will also be checked. To click on this button the input box will appears like this,

Enter book-number

OK

If given book-no. is found in the books list, the message 'Book is found' will appear. Availability of copies will be displayed on the screen. If copy of that particular book-no. is not found, "Book is found, but no copies are there to issue a book" message will be displayed. If given book-no. is not found in the list, "Book is not found" message will appear on the screen.

Return

The other term used for return of books is discharging books.

While recording the return of books, the procedure verifies the due date (i.e., return date-issue date).

If it is greater than due date, the amount of fine to be paid by the members will be displayed.

By clicking on the return button, it shows input box,

Enter transaction No.

OK

Then given transaction no. is found in the list, the message "Are you sure to return the book?" will appear on the screen. If affirmative reply, "Thank you for returning the book in time" message will appear.

In case a book is returned by the member after the due date, it checks and displays message as "You didn't return the book in time, so please pay the fine". If all these operations are successfully carried out for return of the book by the member, then "Book is successfully returned" message will appear on the screen.

Renewal

The members can renew the books, if they desire so. For that, a renewal button is designed in this form. One member can renew the book three times from the due date.

If a member tries to renew a book much before due date, the message appears like below.

"It's too early to renew a book"

If renewal of the book is after a long time from the due date has passed, "It's too late to renew, return it" message will on the screen. If book is returned on the exact due date and the member wants to renew it, confirmation message box with "Are you sure to renew your book?" message appears.

If member has already renewed three times, and wants to renew again, the warning message "You can't renew your book, return it" will appear on the screen.

Close

If membership is over for a particular member, then close option for that particular membership is available to delete the membership from the record. This can be done in this form by using the 'close' button. Before closing check Id number of the particular member and details of that member.
Then confirmation message box with "May I close your membership" message displays. After confirmation from message box by click on 'Yes' button,

<table>
<thead>
<tr>
<th>Confirmation</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;May I close your membership&quot;</td>
</tr>
<tr>
<td>Yes</td>
</tr>
</tbody>
</table>

next message box appears like below

<table>
<thead>
<tr>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Member is deleted</td>
</tr>
<tr>
<td>OK</td>
</tr>
</tbody>
</table>

To check whether a particular membership is closed or not, again click on close button, input box will appear like this.

<table>
<thead>
<tr>
<th>Enter transaction no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OK</td>
</tr>
</tbody>
</table>

Give that member’s Id. no. related transaction no. in the box and the message “Record not found” displays on the screen. Then another message “Membership is closed successfully” is also displayed.

**Book Lost**

If any member has lost a book, collect cost of that book as fine from that member. For this select “Book lost” button. First check when that book was issued to the member, and when it was lost. For this, the following message box will come on the screen,

<table>
<thead>
<tr>
<th>Confirm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are you sure that book is lost?</td>
</tr>
<tr>
<td>Yes</td>
</tr>
</tbody>
</table>

**Card Lost**

This command button will give information about member cards. The member has lost the card, or his/her all cards are issued, or his/her account closed etc, information can be searched by using the ‘card-lost’ button.

**Exit**

After transaction is over exit from that form by using the ‘exit’ button.

**BOOK-DETAIL FORM**

The book detail form (Fig. 4) gives the details of available books in the library, sorted according to book number, book title, book author, subject and publisher. Members can select any desired way from sorted points. For example, if he wants information about the subject (electronics), he selects 'subject' option, click on that option, and gets sorted list according to subject.

**ADVANTAGES**

This VISUAL BASIC based circulation system has the following advantages:

i) Member’s queries on the availability of books can be answered quickly.

ii) ‘Book details’ form will give the sorted list of books by several options like book number, author, title, subject etc.

iii) Certain operations like, registration (add new record), cancellation of membership, weeding out of books by deletion, charging (issuing) and discharging (returns) have restricted access in order to prevent any malpractices.
iv) Which book is lost, and whose cards are lost and fine calculation etc. information can be known quickly from the transaction form.

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

The output of almost all functions is given in the appendices in order to understand the process properly.

Fig. 4: Book details form
AUTOMATED CIRCULATION SYSTEM USING VISUAL BASIC 6.0

REFERENCES


2. SASIKALA (C), RAMA PAINAIK (K) and SOMASEKHARA RAO (K). Automated circulation system using Clipper. Annals of library science and documentation. 45, 2; 1998: 57-65.


5. PERRY (Grey) and HETTIHEWA (Sanjava). SAMS teach yourself Visual Basic 6 in 24 hours. 1998. Techmedia; New Delhi.

Table : Transact

<table>
<thead>
<tr>
<th>Name</th>
<th>Null?</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID_NO</td>
<td></td>
<td>NUMBER(6)</td>
</tr>
<tr>
<td>B_NO</td>
<td></td>
<td>VARCHAR2(10)</td>
</tr>
<tr>
<td>B_TITLE</td>
<td></td>
<td>VARCHAR2(100)</td>
</tr>
<tr>
<td>I_DATE</td>
<td></td>
<td>VARCHAR2(10)</td>
</tr>
<tr>
<td>RET_DATE</td>
<td></td>
<td>VARCHAR2(10)</td>
</tr>
<tr>
<td>RENU_DATE</td>
<td></td>
<td>VARCHAR2(10)</td>
</tr>
<tr>
<td>NO_RENU</td>
<td></td>
<td>NUMBER(2)</td>
</tr>
<tr>
<td>FINE</td>
<td></td>
<td>NUMBER(6,2)</td>
</tr>
<tr>
<td>TRANS_STATUS</td>
<td></td>
<td>VARCHAR2(10)</td>
</tr>
<tr>
<td>TRANS_NO</td>
<td></td>
<td>NUMBER(10)</td>
</tr>
</tbody>
</table>

Table : Member

<table>
<thead>
<tr>
<th>NAME</th>
<th>NULL?</th>
<th>TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDNO</td>
<td></td>
<td>NUMBER(6)</td>
</tr>
<tr>
<td>MNAME</td>
<td></td>
<td>VARCHAR2(50)</td>
</tr>
<tr>
<td>FNAME</td>
<td></td>
<td>VARCHAR2(50)</td>
</tr>
<tr>
<td>DESIG</td>
<td></td>
<td>VARCHAR2(20)</td>
</tr>
<tr>
<td>BDATE</td>
<td></td>
<td>VARCHAR2(10)</td>
</tr>
<tr>
<td>ADDR</td>
<td></td>
<td>VARCHAR2(75)</td>
</tr>
<tr>
<td>JDATE</td>
<td></td>
<td>VARCHAR2(10)</td>
</tr>
<tr>
<td>CDATE</td>
<td></td>
<td>VARCHAR2(10)</td>
</tr>
<tr>
<td>CARDS</td>
<td></td>
<td>NUMBER(2)</td>
</tr>
<tr>
<td>RCARDS</td>
<td></td>
<td>NUMBER(2)</td>
</tr>
<tr>
<td>STATUS</td>
<td></td>
<td>VARCHAR2(5)</td>
</tr>
</tbody>
</table>
Table: Books

<table>
<thead>
<tr>
<th>Name</th>
<th>Null?</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOOK_NO</td>
<td></td>
<td>VARCHAR2(10)</td>
</tr>
<tr>
<td>BTITLE</td>
<td></td>
<td>VARCHAR2(50)</td>
</tr>
<tr>
<td>BAUTHOR</td>
<td></td>
<td>VARCHAR2(50)</td>
</tr>
<tr>
<td>PUB</td>
<td></td>
<td>VARCHAR2(25)</td>
</tr>
<tr>
<td>SUBJECT</td>
<td></td>
<td>VARCHAR2(50)</td>
</tr>
<tr>
<td>SECTION</td>
<td></td>
<td>VARCHAR2(20)</td>
</tr>
<tr>
<td>PRICE</td>
<td></td>
<td>NUMBER(6,2)</td>
</tr>
<tr>
<td>PDATE</td>
<td></td>
<td>VARCHAR2(10)</td>
</tr>
<tr>
<td>LDATE</td>
<td></td>
<td>VARCHAR2(10)</td>
</tr>
<tr>
<td>COPIES</td>
<td></td>
<td>NUMBER(3)</td>
</tr>
<tr>
<td>RCOPIES</td>
<td></td>
<td>NUMBER(3)</td>
</tr>
</tbody>
</table>
AUTOMATED CIRCULATION SYSTEM

Program structure
FLOW/CHART FOR BOOK ENTRY PROGRAM

Start

Accept Book_No

Read details from Book Database

Copies = n copies

Display Book_No, Btitle, Bauthor

Stop

Start

Read Book_No

Check Book_No

False

Stop

True

Display details from Book database

Exit
FLOWCHART FOR MEMBERSHIP FORM

Start

Read data from member database

Check IDNO

False
Stop

True

Display details from Member database

Exit
Flowchart for Transaction

Start

Accept Trans_No.

Transact No. = Trans_No. + 1

If Current date > due date

Yes

Calculate Fine A

Delete from Trans file

No

Exit

Flowchart for Fine calculations

A = fine

Due_days = current date - due date

If Book lost

Yes

Fine = cost of Book

Exit

No

If due_days > 30

Yes

Fine = 5.00

No

Fine = 10 x days

Trans_status = issue

Exit
FLOW CHART OF BOOK ENTRY FORM

Start

Read Ch

Ch = 1 → Add New Record

Ch = 2 → Modify

Ch = 3 → Fetch

Ch = 4 → Delete

Exit
FLOW CHART OF MEMBER CREATION FORM

Start

Read Ch

Ch = 1
Add New Record

Ch = 2
Modify

Ch = 3
Search

Ch = 4
Delete

Exit
FLOW CHART OF TRANSACTION FORM

Start

Read Ch

Ch= 1

Ch= 2

Ch= 3

Ch= 4

Ch= 5

Ch= 6

Ch= 7

Issue

Renewal

Return

Close

Book lost

Card lost

Search

Exit
FLOW CHART OF BOOK DETAIL FORM

Start

Read Ch

Ch= 1

Ch= 2

Ch= 3

Ch= 4

Ch= 5

Ch= 6

Book No. | Author | Title | Subject | Section | Publisher

Exit