

**A Project Report
On**

**DATABASE DESIGN AND APPLICATION
DEVELOPMENT USING VISUAL BASIC AND MS
ACCESS FOR ADMINISTRATION OF A LIBRARY**

by

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STUDENT NO. DF0131016**

Session: 2001-2002

**Institute of Information & Communication Technology(IICT),
Bangladesh University of Engineering & Technology(BUET),
Dhaka-1000, Bangladesh.**

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A PROJECT REPORT SUBMITTED BY

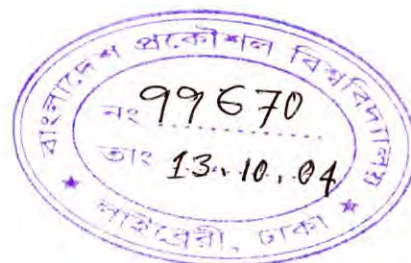
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For The Partial Fulfillment of

**POST GRADUATE DIPLOMA
IN
INFORMATION AND COMMUNICATION TECHNOLOGY**

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Session: 2001-2002

**Institute of Information & Communication Technology(IICT),
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CERTIFICATE

This project titled "Database Design and Application Development using Visual Basic and MS Access for Administration of a Library ", submitted by Shib Prasad Acharjee, Roll No: DF0131016, session: 2001-2002, has been accepted as satisfactory in partial fulfillment of the requirements for the PG. Diploma (ICT) in the Institute of Information & Communication Technology, BUET.

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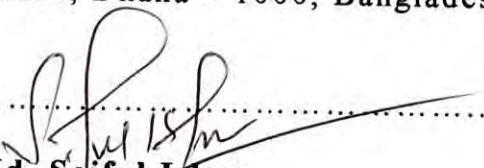
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I declare that the project entitled "DATABASE DESIGN AND APPLICATION DEVELOPMENT USING VISUAL BASIC AND MS ACCESS FOR ADMINISTRATION OF A LIBRARY" is a piece of original research work. This work has not been presented anywhere before for the award of any other degree or diploma or publication.

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(Shib Prasad Acharjee)

ABSTRACT

A library needs to handle a lot of information which is related to books, authors, members etc. It is a tough task to handle all these things manually but can be done easily with the help of modern Information Technology. As of late computers are being used in many libraries in Bangladesh to handle these things. So some dedicated software which can maintain a large scale database are required for this purpose. This project is an application software that can be used to maintain and operate any medium and large scale database of a library very efficiently and effectively. This software helps an administrator to handle everything of a library very sophisticatedly. The tools which are created here are very highly helpful for the documentation of the resources of a library. The users can easily use these tools to keep any type of information related to library management. This project also has a very useful, powerful and dedicated report generating tool which provides reports on books, members etc. With the help of these tools we can know daily, monthly or even yearly transaction of the books, the books a member borrows, details book information, details member information, the name of the authors of any book, fines for returning books lately etc.

ACKNOWLEDGEMENT

It is a matter of immense pleasure to have the opportunity to present this report titled "DATABASE DESIGN AND APPLICATION DEVELOPMENT USING VISUAL BASIC AND MS ACCESS FOR ADMINISTRATION OF A LIBRARY" for the partial fulfillment of the requirements of PG. Diploma (ICT) under the Institute of Information and Communication Technology (IICT), Bangladesh University of Engineering and Technology (BUET).

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Chapter One

Introduction

Chapter One

Introduction



1.1 Conception of Library Management System

A library is a huge collection of books, magazines and other documents. It is very difficult to handle a library manually. It needs many people and other things. But now it is the age of modern science and technology and many of the libraries are computerized. So it needs a system that can be used to maintain and operate any medium and large scale libraries very efficiently and effectively through information management. It helps a lot to handle a library. In our country libraries are going to be computerized day by day and we need some sophisticated software for this purpose. It has to serve us with various purposes. Students can check out a book for four weeks, and faculty for three months. Library staff may keep a book for an entire year. Any checkable library resource may be renewed as long as no other patron has requested it. Faculty and library staff can place a book on reserve for the period of one semester, or they may bring in foreign resources such as books, papers, disks, magazines etc. that do not belong to the library. Library must also manage a large selection of weekly, monthly, and quarterly magazines, which may not be checked out but are available as reference materials. These magazines are annually bound into volumes or recorded as microfiche. Additional activities of the library staff include re-shelving books, renewing magazine subscriptions, and ordering new library resources. It also needs to keep information about up-to-date resources of the library. A database, an up-to-date report generating tool and other information tools have to be facilitated within the library management system.

1.2 Objectives

The objective of this project is to computerize the management system of a library. Every library needs to issue books, collect them and upgrade information about the resources of the library. MS Access is used to build up a database, Seagate Crystal Report is used to

generate up-to-date reports of the books, members of the library etc. and Visual Basic is used to develop the system. In this project user friendly interfaces are developed which provides easy, fast and interactive way to communicate with the information of the library. The objective of this project is to analyse and design a library management system, to provide a secured and sophisticated system to handle a large scale library and to eliminate manual system.

1.3 Outline of the System

Methodology is the working process. It is the process where the way or paths are described for the completion of the work. The methodology for developing the software was divided into the following components, which are given below:

1.3.1 Collect Information for the design

Information is very important for any job. Collection of information for a particular job is essential to develop the whole project. Various important information about the project was collected like collection of data for daily transaction of books.

1.3.2 Design the Project planning with project Management Software

Project Management (PM) is a task that develops during the project for planning and scheduling the project. The system was designed in PM for planning and scheduling all the working days in a Gantt chart. Thus the time interval for a particular work could be estimated.

1.3.3 Analysis the system

Analysis the system means the system should be analysed. Thus it should be easy to design for future update.

1.3.4 Develop the use case diagram

The use case diagram was drawn. Rational Rose is the software that was used for the diagrams. Here the relationship among various class and attributes are shown with several diagrams.

1.3.5 Develop the Database in Microsoft Access (MS-Access)

The database was developed in MS-Access in some tables with there relationship. The total data or information are normalized and then tables are obtained.

1.3.6 Develop the project

The total project is then developed in Visual Basic programming with the connection of database in MS-Access.

1.3.7 Test the project

Testing is an important part of any project. It reduces the errors, problems and other mistakes in the programming. The testing of the project was not completely done.

1.3.8 Documentation and Use's Manual Creation

Documentation is the process of making the whole work in a document (like a file in a Microsoft Word). It helps the future system analyst or programmer to change or update the system. The documentation is not totally completed. The user manual is done in MS-Word.

1.3.9 Implement the project

Finally after checking, testing, reviewing and changing the project must be implemented for the final work.

Chapter Two

Concept of Database and its Application

Chapter Two

Concept of Database and its Application

2.1 Concept of Database

Database systems are designed to manage large bodies of information. Management of data involves both defining structures for storage of information and providing mechanisms for the manipulation of information. In addition, the database system must ensure the safety of the information stored, despite system crashes or attempts to unauthorized access. If data are to be shared among several users, the system must avoid possible anomalies results.

A database management system (DBMS) is a collection of interrelated data and a set of programs to access those data. The collection of data, usually referred to as the database, contains information relevant to an enterprise. The primary goal of a DBMS is to provide a way to store and retrieve database information that is both convenient and efficient.

2.2 Information Modeling

Whenever understanding of a real world phenomenon or interaction is desired the first step is to build a simple model representing the phenomenon and perform study and evaluation of the model rather than actual interaction. In building model the ambiguity and complexity in the real world is avoided totally or compensated with valid approximation. In fact a systematic study of any phenomenon whether economic, industrial or scientific is done through modelling. Information modelling pertains to development of model in information generation, storage, destruction, evaluation, manipulation, synthesis and utilizations. These models help in systematisation of information generation, flow, interpretation and synthesis of more information.

The first step of information modelling is to precisely choose only that part of reality, which is of interest. This is known as Entity. Entity defines other parameters. Entities are atomic i.e. they are indivisible. The parameters if as entity are known as attribute.

Attributes are quantum of information, which describe the entity entirely. Attributes themselves can be thought of entities, which make the first entity of a composite entity.

The key attribute is one, which distinguishes one occurrence of an entity from other. It is associated with all other attributes with a one-to-one relation.

The second step in information modelling is relationship among entities. It is most important in making sense of the entity and inter-entity relationship. The relationship is the information, which links two entities. The relationship can be of four categories such as One to One, One to Many, Many to One and Many to Many. In One to One relationship one instance of the first entity can correspond to only one instance of the second entity. In One to Many relationship one instance of the first entity can correspond to more than one instance of the second entity. In Many to One relationship more than one instance of the first entity can correspond to only one instance of the second entity. In Many to Many relationship more than one instance of the first entity can correspond to more than one instance of the second entity.

2.3 Normalization of Data

- a) **Eliminating Repeating Groups:** Make a separate table for each set of related attributes and give each table a primary key.
- b) **Eliminating Redundant Data:** If attribute depends on only part of a multi-valued key, remove it to a separate table.
- c) **Eliminate Columns not dependent on Key:** If attributes do not contribute to a description of the key, remove them to a separate table.
- d) **Isolate Independent Multiple Relationship:** No table may contain two or more 1:N or N:M relationships that are not directly related.
- e) **Isolate Semantically Related Multiple Relationship:** There may be practical constraints on information that justify separating logically related many-to-many relationships.

2.4 Concept of Data Modeling

For an information system to be useful, reliable, adaptable and economic, it must be based on first on sound data modelling and only secondarily on process analysis.

A data model is a model describing the data in an organization. It provides a framework for abstracting the essential qualities or characteristics of data. Data modelling is the process of abstraction and documentation using a data model.

Data modelling creates hierarchies of abstraction along two dimensions: aggression and generalization. Aggression identifies data items as arts of higher-level, more aggregate descriptor. Generalization creates categories into which a data item may be classified.

There are two major classes of data models - logical data models and physical data models. These two classes reflects the fact that efficient physical storage and retrieval of data must be designed around the physical characteristics if storage media and devices, but users of data should be able to describe, think about and use data without being concentrated about its physical storage.

2.5 Different Kinds of Data Model

The data modelling consists of three interrelated pieces of information, the data object, the attributes that describe the data object and the relationship that connect data objects to one another. A data object is a representation of almost any composite information that must be understood by software. Composite information means something that has a number of different properties or attributes.

Six different types of data models are given below:

1. Entity-Relationship Model (E-R Model)
2. Relational Model
3. Object-Oriented Data Model
4. Object-Relational Data Model
5. Hierarchical Data Model
6. Network Data Model

2.6 The Area Database Management System used

Now-a-days database management system is widely used in the real world. The database management system is used in banking, universities, human resources, telecommunications, credit and transactions, finance, manufacturing, customs, sales, defence, government sectors etc.

Chapter Three

Methodology and Database Design

Chapter Three

Methodology and Database Design

3.1 Definition

Methodology of a study portrait the way of study is being completed. An organized methodology is the guidelines for successful completion of a study. Following methodology is being used to complete this project.

3.2 Selection of the project

The library is a collection of vast amount of books. It needs a handful tools to monitor and keep vast information. In modern age computerized library is used to fulfill this purpose. To satisfy this purpose this project has been done. This is an application software which is friendly to the user and easy to remember all the tools created here. Graphical User interface for such a program simplifies the usage and makes it easier for people to get started using this software as a tool of library management system.

3.3 Collection of Information for developing database

Library is the largest source of any information from the primitive age to the ultra modern age. Collection of information about a large-scale library from all possible ways has been done during this period. Every raw data have been captured in a file for further analysis.

The flowchart of the Methodology is given in the next page:

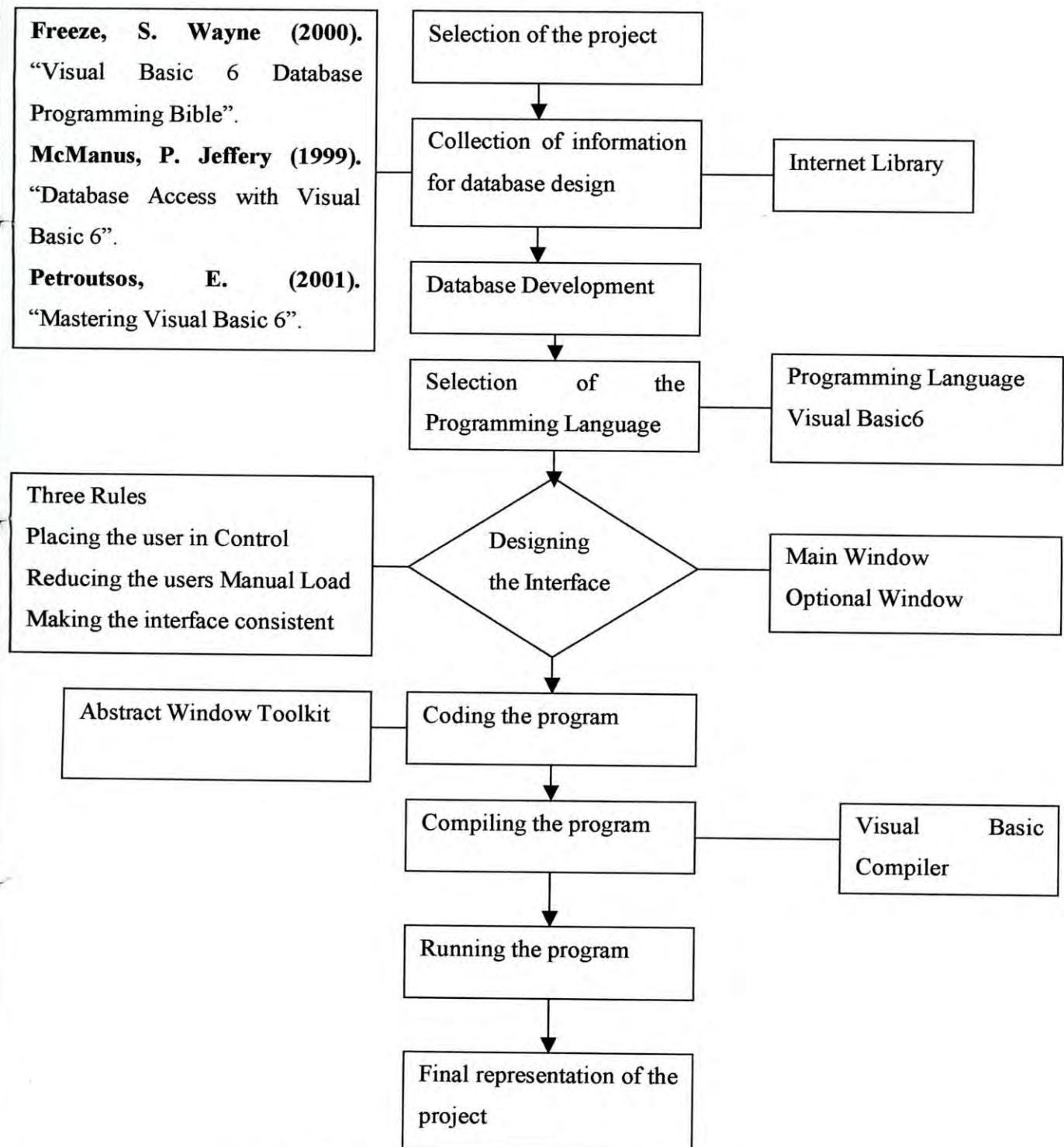


Figure 3.1: Flowchart of the Methodology

3.4 Database Development

Relational database management system was used to manage the database. The database was developed in MS Access in six tables with three relationships. The total data have been normalized and then tables are obtained.

3.4.1 Description of the Database Developed

For simplicity, six tables have been designed namely Member table, Book table, Fine table, Transaction table and Return table. Brief description of the tables are given below:

- ❖ **Member Table** – It has six columns (Mbr_Idn, Mbr_Nme, Mbr_Ocpn, Mbr_Adrs, Mbr_Cntr, Mbr_Edate) holds values for identification of member, name of member, Profession of the member, address of member, contact no of member, entry date of member respectively.

Mbr_Idn — text

Mbr_Nme — Text

Mbr_Ocpn — Text

Mbr_Adrs — Memo

Mbr_Cntr — Number

Mbr_Edate — Date/Time

- ❖ **Book Table** – It has seven columns (Bk_Idn, Bk_Nme, Bk_Type, Athr_Nme, Bk_Pblcn, Bk_Cps, Bk_Edate) holds values for identification no of books, name of books, type of books, author's name, publication of the book, numbers of book, entry date of the books relatively.

Bk_Idn — Number

Bk_Nme — Text

Bk_Type — Text

Athr_Nme — Text

Bk_Pblcn — Text

Bk_Cps — Number

Bk_Edate — Date/Time

- ❖ **Fine Table** – It has six columns (Fn_Idn, Mbr_Idn, Trns_Idn, Rtrn_Idn, Fn_Amnt, Fn_Date).

Fn_Idn — AutoNumber

Fn_Amnt — Number

- ❖ **Transaction Table** – It has four columns (Trns_Idn, Mbr_Idn, Bk_Idn, Trns_Idate)

Trns_Idn — AutoNumber

Mbr_Idn — text

Bk_Idn — Number

Trns_IDate — Date/Time

- ❖ **Return Table** – It has three columns (Rtrn_Idn, Trns_Idn, Rtrn_Date)

Rtrn_Idn — AutoNumber

Trns_Idn — AutoNumber

Rtrn_Date — Date/Time

- ❖ **Author Table**- It has two columns(Bk_Idn, Athr_Nme)

Bk_Idn — Number

Athr_Nme — Text

Relationship:

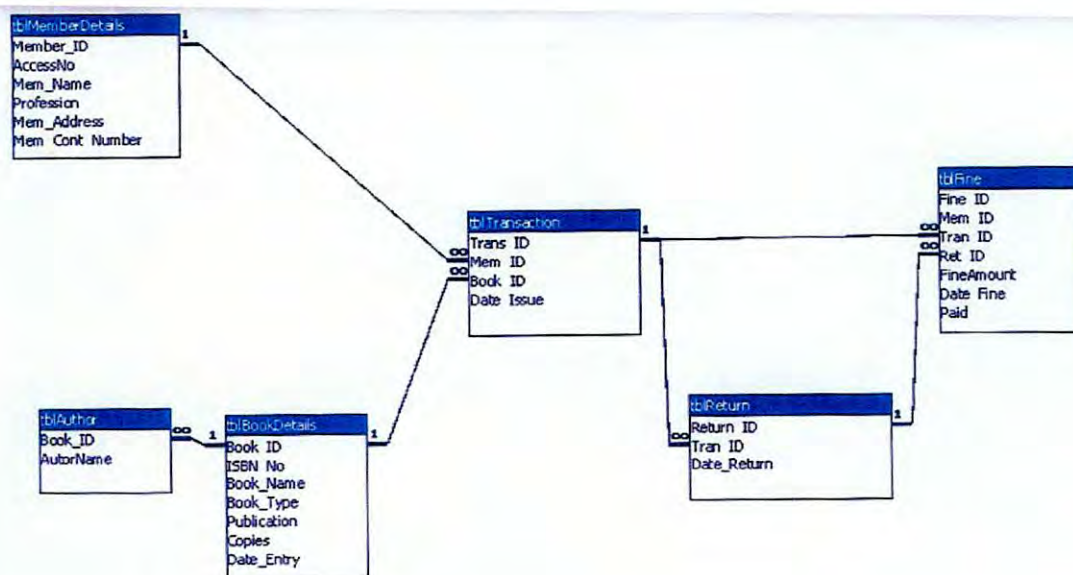


Figure 3.2.1: Relationship of Tables

3.4.2 Data Used for the Development

These sets of example data for the five tables are shown below:

Member Table:

Mbr_Idn	Mbr_Nme	Mbr_Ocpn	Mbr_Adrs	Mbr_Cntr	Mbr_Edate
0131001	Shibu Acharjee	Student	13/F, Palashy	8777098	2-Mar-03
0131002	J.J. Banarjee	Student	Azimpur, Dhaka	1034333	20-June-03
0131003	P.P. Bhattacharjee	Student	Dhaka	7122268	5-Mar-03

Book Table:

Bk_Idn	Bk_Nme	Bk_Type	Athr_Nme	Bk_Pblcn	Bk_C ps	Bk_Edate
IICT011	MCSD Visual Basic	Programming	Lyle Bryant	Techmedia	2	20-Jan-03
IICT012	Database Management System	Database	Raghu Ramakrishnan	McGraw- Hill	1	22-Mar-03
IICT013	Programming with C (2 nd Edition)	Programming	Byron Gottfried	McGraw Hill	5	17-Feb-03
IICT014	Local Area Networks	Networking	Christa Anderson	BPB	3	28-Feb-03

Fine Table:

Fn_Idn	Mbr_Idn	Tms_Idn	Rtrn_Idn	Fn_Amnt	Fn_Date
1	0131001	10	1	10	1-Sep-03
2	0131002	11	5	15	2-July-03
3	0131003	12	6	20	5-Aug-03

Transaction Table:

Tms_Idn	Mbr_Idn	Bk_Idn	Tms_Idate
10	0131001	IICT013	22-April-03
11	0131002	IICT011	22-May-03
12	0131003	IICT012	22-April-03
13	0131002	IICT011	22-May-03
14	0131001	IICT012	26-May-03
15	0131002	IICT013	22-May-03
16	0131002	IICT013	22-Mar-03
17	0131001	IICT011	15-Mar-03
18	0131003	IICT011	22-Mar-03
19	0131002	IICT012	22-April-03
20	0131001	IICT013	28-Mar-03

Return Table:

Rtrn_Idn	Tms_Idn	Rtrn_Date
1	12	26-Mar-03
2	13	29-Mar-03
3	14	26-Mar-03
4	15	26-Mar-03
5	16	29-Mar-03
6	17	31-Mar-03

Author Table:

Bk_Idn	Athr_Nme
IICT011	Lyle Bryant
IICT012	Raghu Ramakrishnan
IICT013	Byron Gottfried
IICT014	Christa Anderson

3.5 Selection of the Programming Language

The selection of a program is very much important as it helps to design interface and run the application smoothly. In this project interface is designed with the help of Visual Basic 6 because it provides easy Abstract Window Toolkit and is widely used. Visual Basic is an extremely rich programming environment and contains the basic components of developing user's interface. It is an Integrated Development Environment in which we can develop, run, test and debug our applications. The programmer can easily use the build up tool kits for any application software. It has evolved into a major development environment that covers every aspects of programming, from educational applications to database, and from financial applications to Internet components. Event driven programs can be developed in a visual environment. In future the platform independent language

Java can be used. In this project Visual Basic 6 is used for programming, MS Access is used for Database and Crystal Report is used to retrieve data directly.

3.6 Designing the interface and coding

The user interface is the most important element of a computer-based system or product. Three important principles guide the design of effective user interfaces:

- i.** Placing the user in control
- ii.** Reducing the user's memory load
- iii.** Making the interface consistent

To achieve an interface that abides by these principles, organized design process is conducted. In the menu bar it has File, Report, Control and Help. Under these titles some important and useful tools are available for this system. If someone doesn't understand the meaning off these options then a manual page is stand by him.

Appropriate code is written by Visual Basic programming language to run the interface.

3.7 Compiling and running the program

After creating the Visual Basic program it is compiled using Visual Basic compiler before running it. The compiler translates the source code those are components of a machine-level language. Then it is run.

3.8 Presentation

Developing the graphical Interfaces, the project is represented in various ways:

- (a) Report
- (b) To run the project
- (c) Demonstration of the interfaces
- (d) Figures
- (e) Power point plates

Chapter Four

Software Design

Chapter Four

Software Design

4.1 Definition

Software design is an iterative process through which requirements are translated into a “blueprint” for constructing software. Initially, the blueprint depicts a holistic view of software. That is, the design is represented at a high level of abstraction — a level that can be directly traced to the specific system objective and more detailed data, functional, and behavioural requirements.

4.2 A tour to the Software

The administrator of a library can manipulate data deliberately with the help of this software. It assists him/her to keep information of the members, books and all other things associated with the library comfortably, satisfactorily, safely and securely. The details of the interface of this software are described below.

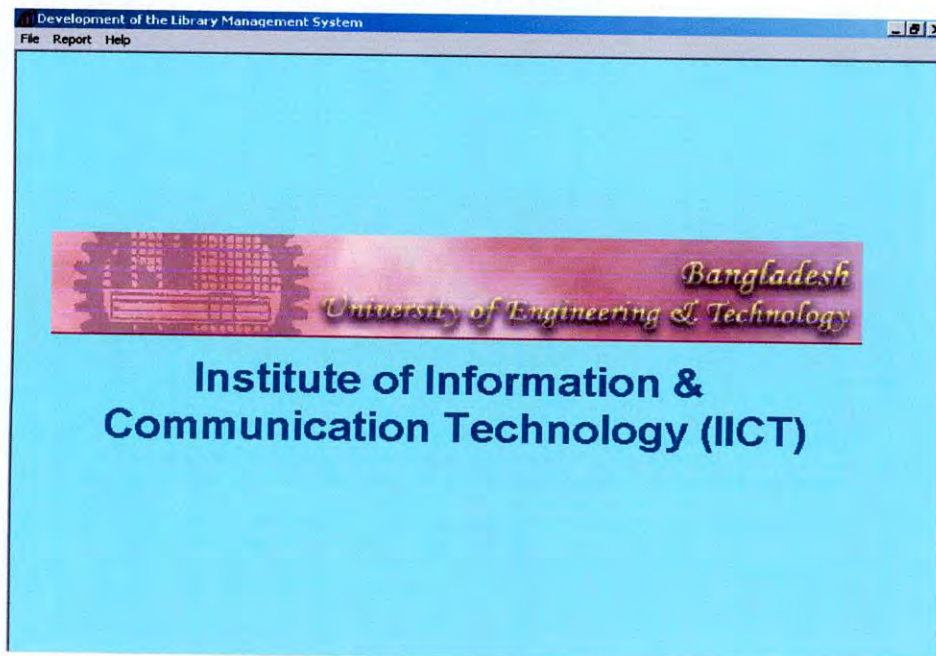


Figure 4.1: Home page

4.2.1 Menu Bar:

In the menu bar it has File, Report, Control and Help. The pull down menu under File are Member details, Book details, Issue book, Return book and Exit. The pull down menu under Report are Detail member list, Individual member information, Detail book list, Individual book information, Daily issued books, Daily return books. The pull down menu under control is program set up to decide the fine and others.

4.2.2 Data input for members:

Development of the Library Management System - [Membership Form]

File Report Help

Member Detail Information

Member ID: 1

Member Name: Moammad Ragib Akter (Linkon)

Occupation: Service

Address: 14/A Garden Road, West karwan bazar, Dhaka 125

Contact Number (s): 9115604

Membership Date: 3/22/2003 (mm-dd-yy)

Previous Next

Add New Member Update Member Delete Member Close

2. Enter member ID

3. Enter name

4. Enter service name, address etc.

To explore click 'Previous' or 'Next'

1. First press this button to add new

Figure 4.2: Location page reveals Member information

Every member has a member ID. The administrator has to provide a unique member ID to the members. To make an entry into this library enter a proper member ID in the text space provided for a member. It is important because if anyone wants to know the status of any member of this library he/she has to make a query with the help of this member ID. Then enter another information of the member in a proper format in the space

provided. The other information are member name, occupation, address, contact no, membership date etc. To add new member click 'Add New Member' button and then add all information about the new member. To update member information click 'Update Member' button. Then update the necessary data. To delete any member click 'Delete Member button' and then delete the required member from the library. There are 'Previous' and 'Next' button. With the help of these buttons we can find out information about next and previous members. When the job is completed press the 'Close' button. The interface is very much user friendly. We can add new member, update and delete information of any member here.

4.2.3 Data input for Books:

Database Design And Application Development

Book Detail Information

Access No:

ISBN No:

Book Name:

Book Type:

Publisher:

Copies:

Date Recd:

Book ID	Access No	Book Name
1	101	101
2	102	102
3	103	103
4	104	104
5	105	105
6	106	106
7	107	107
8	108	108
9	109	109
10	110	110

add Edit Delete Refresh Close

Record: 1

Figure 4.3: Location page reveals Book information

Every book has a unique Access no and ISBN no. To make a file of a book enter proper Access no and ISBN no. of the book in a proper format. It is very important because if anyone wants to make a query of a particular book he/she has to use this Access no. Then enter other information such as book name, book type, publication, copies, date entry etc.

in proper format in the specified space provided. A book may have more than one author. There are facilities to do so. To add a new book click 'Add' button and then enter all information of this book. To edit anything click 'Edit' button and get the job done. To delete any book information click 'Delete' button. When everything is completed click 'Close' button. The user can add new book, update and delete information of any book here.

4.2.4 Issue Book:

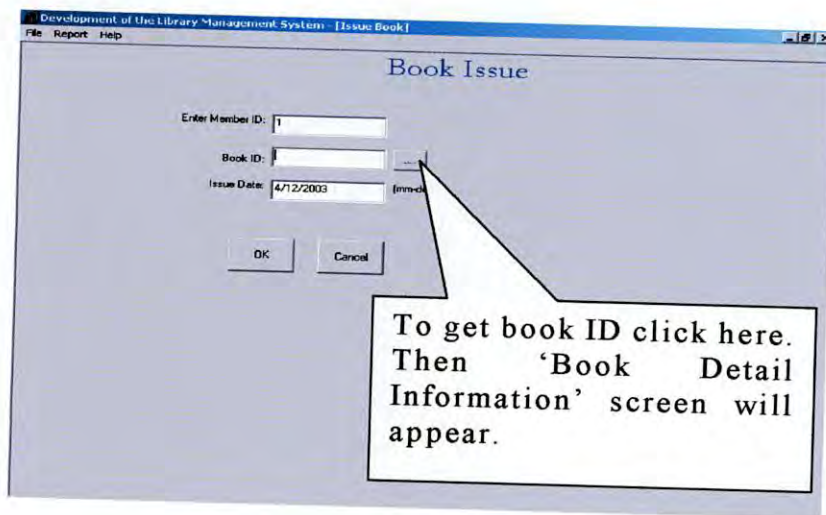


Figure 4.4: Location page shows book issue.

To issue book to a member a member ID is required. Enter member ID into the text box and then press ENTER. Enter Access no of the book. To enquire the books of the library press the button(...) at the right hand side of the text box. Any one can select books by searching with book type, author, publication or book name. All kinds of type are shown at the right hand side of it. Select book type to see detail information of the books. It will show its access no, ISBN no, book name, book type, publication, no of copy, book entry date etc. 'Previous' and 'Next' buttons are provided to explore the books in the library. 'Ok' and 'Cancel' buttons are for the user.

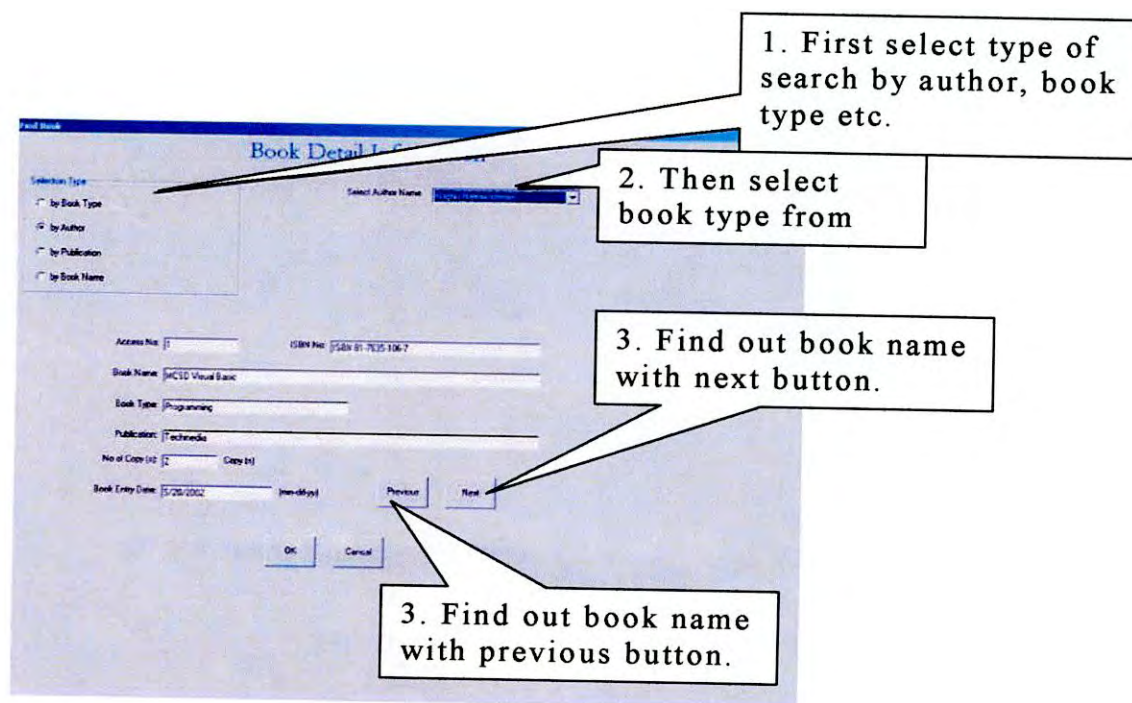


Figure 4.5: After selecting both the Member ID and Book ID (1st fig.), it shows the detail information of the selected book (2nd fig).

4.2.5 Return Books:

Figure 4.5: Location page reveals the information of returning book showing total fine, if any.

At the time of returning books enter Issue ID, if it is forgotten enter 'If Forget Issue ID' button to enter member ID. Then press Ok button to get Issue ID. Now press ENTER it will show member details, book details, issued books in details etc. There is a fantastic facility to make fine to a member if the book is not returned duly. It will show the total amount of fine. The administrator can charge the amount of fine according to his requirement.

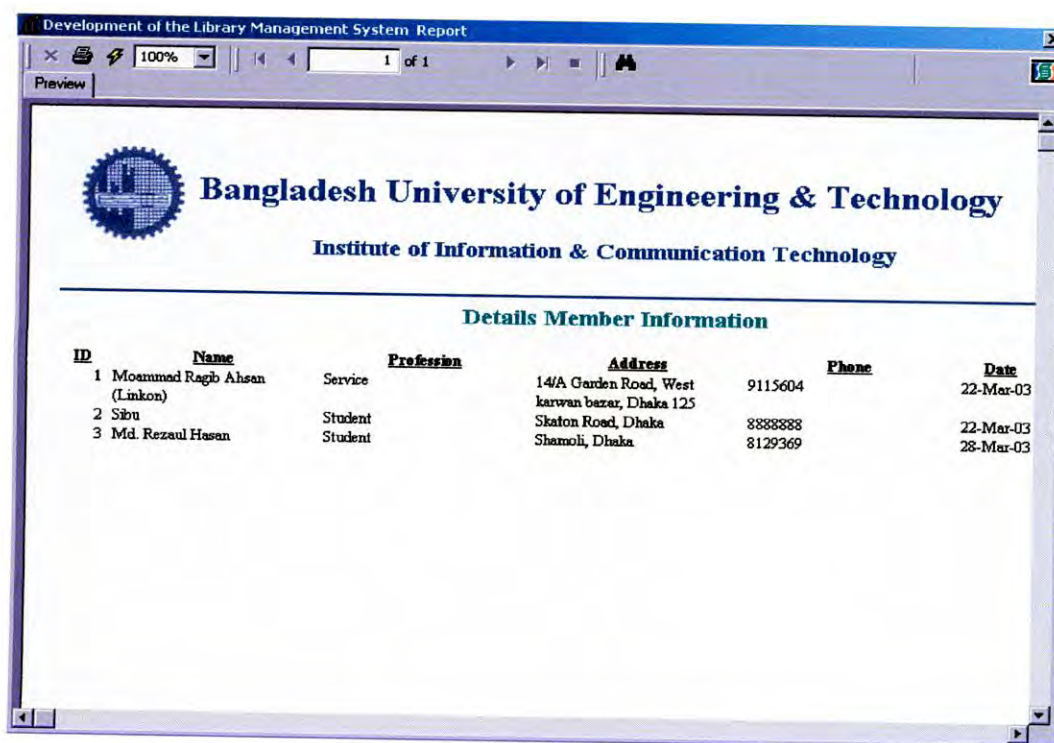
4.2.6 Fine for late return:

The pull down menu 'Program set up' under 'Control' is used to decide the rate of fine for different kinds of books on daily basis or on monthly basis. The administrator can only decide it for a library as it depends on the institute using this software.

4.2.7 Producing reports:

This application program can produce a precise report on members, books etc. It can be used to make a report either on all the members of the library or on a member individually in details. It shows the present status either of all the books of the library or of a book individually. It also helps to know about daily issued books and daily return books. The reports are very helpful for managing a library.

Here are some samples of the reports:



Development of the Library Management System Report

100% 1 of 1

Preview

 **Bangladesh University of Engineering & Technology**
Institute of Information & Communication Technology

Details Member Information

<u>ID</u>	<u>Name</u>	<u>Profession</u>	<u>Address</u>	<u>Phone</u>	<u>Date</u>
1	Muhammad Ragib Ahsan (Linkon)	Service	14/A Garden Road, West karwan bazar, Dhaka 125	9115604	22-Mar-03
2	Sibu	Student	Skaton Road, Dhaka	8888888	22-Mar-03
3	Md. Rezaul Hasan	Student	Shamoli, Dhaka	8129369	28-Mar-03

Figure 4.6: Report showing detail Member information

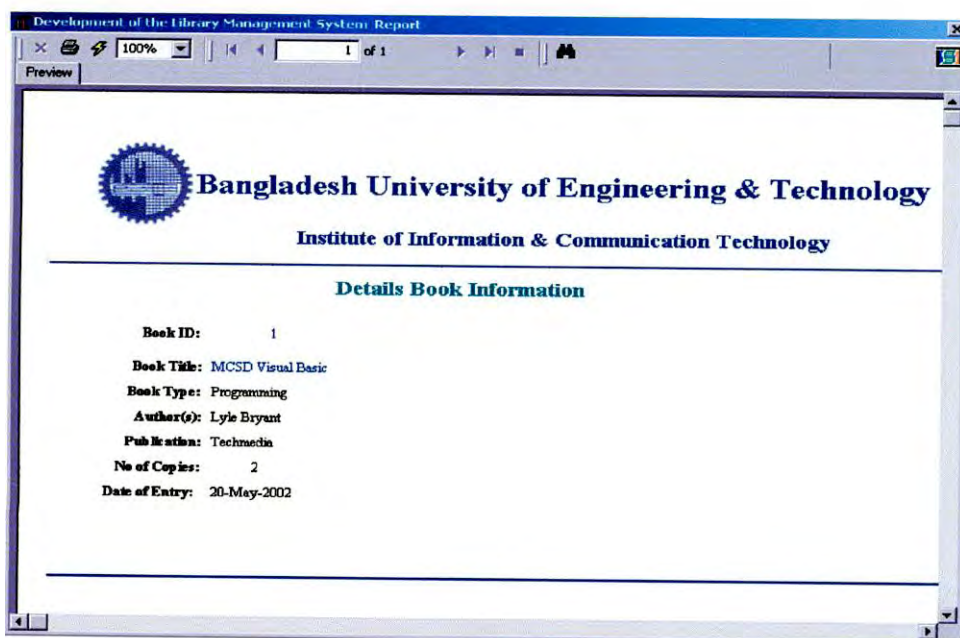


Figure 4.9: Report showing each book information.

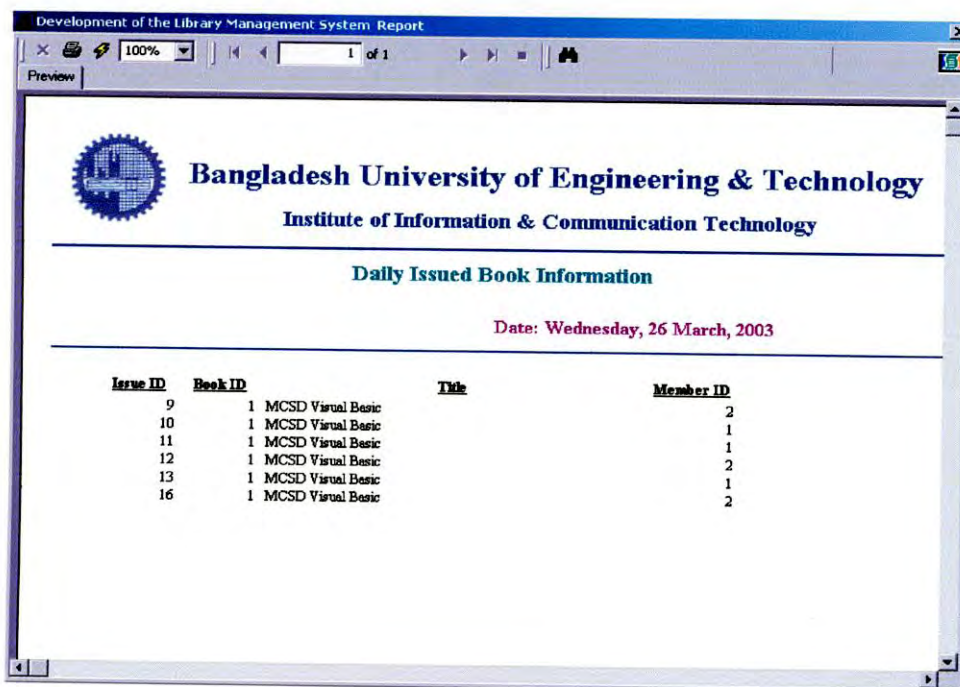


Figure 4.10: Report showing daily issued Book(s)

4.3 Software Testing

Software testing is a critical element of software quality assurance and represents the ultimate review of specification, design, and code generation.

Tests have been planned before testing begins. During developing the application, the traces have been kept where and under what conditions will be performed. All the tests are traceable to the librarian requirements. The software Seagate Crystal Report has been used with this software to show the reports.

4.4 Hardware Requirements

Minimum configurations of the hardware required for the developed software are described below:

Requirements	Details
Processor	1. Recommended Processor: Pentium III or above 2. Minimum Processor: Pentium I
Compatible operating systems	Windows 95, 98, NT, 2000, XP
RAM	1. Typical: 256 MB (512 MB recommended) 2. Minimal installation: 128 MB (256 MB recommended)
Hard disk	1. Typical installation: 20 GB 2. Minimal installation: 13 GB 3. Custom installation: depends on components selected for installation
Others	LAN Card

4.5 Documentation and User's Manual Creation

Documentation is the process of making the whole work in a document (like a file in a Microsoft Word). It helps the future system analyst or programmer to change or update the system. This software has a rich documentation. It helps the analyst very friendly.

Chapter Five

Conclusion and Recommendations

Chapter Five

Conclusion and Recommendations

5.1 Conclusion

As design of a program depends upon the style chosen by the programmer, none can say that his one is the last as better and better solutions are coming everyday. Though standard software has been developed and can be implemented in any libraries, the author has many limitations in his software, some may due to ignorance and some may due to lack of experience. There are many chances for others to enhance this software. It is appreciated for the followers if it is modified as per the requirements of the users.

5.2 Recommendations

Any one can use this software with a little care. If he/she needs any modification or any other facilities he/she is most welcome to suggest so.

Power failure is now a very serious problem in our country. It can happen any time. So a back up power system should be used for this purpose. The other recommendations on this software are:

1. Java programming language can be used instead of Visual Basic programming due to its platform independency.
2. In this software there is no provision on password system. It can be adopted in the system.
3. This software is tested only for some medium scale libraries. If anyone wants to implement it in a large scale libraries Oracle can be used instead of MS-Access2000 for better performance.

References

References

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Appendix

Appendix

The Visual Basic source codes are given below:

frmAbout.frm

Option Explicit

```
Private Sub Command1_Click()  
    Unload Me  
End Sub
```

frmBook.frm

Option Explicit

Dim WithEvents rsMem As ADODB.Recordset

```
Private Sub cmdClose_Click()  
    Unload Me  
End Sub
```

```
Private Sub cmdDel_Click()  
    rsMem.Delete  
    rsMem.MoveLast  
End Sub
```

```
Private Sub cmdNew_Click()  
    ' On Error GoTo err_cmdNew_Click  
    If cmdNew.Caption = "Add New Member" Then  
        rsMem.AddNew  
        cmdNew.Caption = "Save"  
    Else  
        rsMem.Update  
        rsMem.MoveLast  
        cmdNew.Caption = "Add New Member"  
    End If  
End Sub
```

End Sub

```
Private Sub cmdNext_Click()  
    If Not rsMem.EOF Then  
        rsMem.MoveNext  
    Else  
        MsgBox "You are in Last Record", vbOKOnly, modControl.msgTitle  
    End If  
End Sub
```

```
Private Sub cmdPrev_Click()
```

```

    If Not rsMem.BOF Then
        rsMem.MovePrevious
    Else
        MsgBox "You are in First Record", vbOKOnly, modControl.msgTitle
    End If

End Sub

Private Sub cmdUpdate_Click()
    rsMem.Update
End Sub

Private Sub fields_LostFocus(Index As Integer)
    If Index = 6 Then
        fields(Index).Text = CStr(Val(fields(Index)))
    End If
End Sub

Private Sub Form_Load()
    Set rsMem = New ADODB.Recordset
    rsMem.Open "select * from tblBookDetails Order by Bk_Idn", DBCon.condb,
    adOpenStatic, adLockOptimistic

    Dim oText As TextBox
    'Bind the text boxes to the data provider
    For Each oText In Me.fields
        Set oText.DataSource = rsMem
    Next
End Sub

```

frmCalender.frm

Option Explicit

```

Private Sub cmdCancel_Click()
    Unload Me
End Sub

```

```

Private Sub cmdOK_Click()

    Dim strSQL As String, lblCaption As String

    Dim rsID As ADODB.Recordset
    Set rsID = New ADODB.Recordset

    If modControl.CurrReport = "DIB" Then
        strSQL = "select * from tblTransaction Where Bk_Edate = #" &
        Calendar1.Value & "#"
    ElseIf modControl.CurrReport = "DRB" Then
        strSQL = "select * from tblReturn Where Rtrn_Date = #" & Calendar1.Value
        & "#"
    End If

```

```

rsID.Open strSQL, DBCon.condb, adOpenStatic, adLockOptimistic

If rsID.RecordCount > 0 Then
    modControl.RepParaDate = Calendar1.Value
    frmReport.Show 1
    Unload Me
Else
    MsgBox "Sorry!!! You select wrong date", vbOKOnly, modControl.msgTitle
End If

End Sub

Private Sub Form_Load()
    Calendar1.Day = Day(Date)
    Calendar1.Month = Month(Date)
    Calendar1.Year = Year(Date)
End Sub

```

frmFindBook.frm

```

Option Explicit
Dim WithEvents rsMem As ADODB.Recordset
Dim fName As String

Private Sub cmbBookType_Click()
    Set rsMem = New ADODB.Recordset

    rsMem.Open "select * from tblBookDetails Bk_Idn Where " & fName & " = '" &
Trim(cmbBookType) & "'", DBCon.condb, adOpenStatic, adLockOptimistic

    Dim oText As TextBox
    'Bind the text boxes to the data provider
    For Each oText In Me.fields
        Set oText.DataSource = rsMem
    Next
End Sub

Private Sub cmdClose_Click()
    Unload Me
End Sub

Private Sub cmdNext_Click()
    If Not rsMem.EOF Then
        rsMem.MoveNext
    Else
        MsgBox "You are in Last Record", vbOKOnly, modControl.msgTitle
    End If
End Sub

Private Sub cmdOK_Click()
    IssueBook.txtMem(1).Text = rsMem.fields("Bk_Idn")
    Unload Me
End Sub

```

```

Private Sub cmdPrev_Click()

    If Not rsMem.BOF Then
        rsMem.MovePrevious
    Else
        MsgBox "You are in First Record", vbOKOnly, modControl.msgTitle
    End If

End Sub

Private Sub cmdUpdate_Click()
    rsMem.Update
End Sub

Private Sub fields_LostFocus(Index As Integer)
    If Index = 6 Then
        fields(Index).Text = CStr(Val(fields(Index)))
    End If
End Sub

Private Sub optSelType_Click(Index As Integer)
    Dim rsVal As ADODB.Recordset
    Dim SelLabel As String

    cmbBookType.Clear

    If optSelType(Index).Value = True Then
        Select Case Index

            Case 0
                fName = "Bk_Type "
                SelLabel = "Book Type"
            Case 1
                fName = "Athr_Nme "
                SelLabel = "Athr_Nme Name"
            Case 2
                fName = "Bk_Pblcn "
                SelLabel = "Bk_Pblcn Name"
            Case 3
                fName = "Bk_Nme "
                SelLabel = "Book Name"

        End Select
    End If

    Label11.Caption = "Select " & SelLabel

    Set rsVal = New ADODB.Recordset

    rsVal.Open "select " & fName & " from tblBookDetails Order by " & fName,
    DBCon.condb, adOpenStatic, adLockOptimistic

    While Not rsVal.EOF
        cmbBookType.AddItem rsVal.fields(0)
        rsVal.MoveNext
    End While
End Sub

```

```
Wend
End Sub
```

frmIDReport.frm

```
Option Explicit

Private Sub cmdCancel_Click()
    modControl.CurrReport = "Noting"
    Unload Me
End Sub

Private Sub cmdOK_Click()
    modControl.RepParaID = Val(Combo1.Text)
    frmReport.Show 1
    Unload Me
End Sub

Private Sub Form_Load()
    Dim strSQL As String, lblCaption As String

    Dim rsID As ADODB.Recordset

    Set rsID = New ADODB.Recordset

    If modControl.CurrReport = "IMI" Then
        lblCaption = "Select Member ID"
        strSQL = "select Mbr_Idn from tblMemberDetails order by Mbr_Idn "
    ElseIf modControl.CurrReport = "IBI" Then
        lblCaption = "Select Book ID"
        strSQL = "select Bk_Idn from tblBookDetails order by Bk_Idn"
    End If

    rsID.Open strSQL, DBCon.condb, adOpenStatic, adLockOptimistic

    While Not rsID.EOF

        Combo1.AddItem rsID.fields(0)

        rsID.MoveNext
    Wend
    Combo1.ListIndex = 0
    Label1.Caption = lblCaption
End Sub
```

frmMain.frm

```
Option Explicit

Private Sub MDIForm_Load()
```

```

End Sub

Private Sub mnuAbout_Click()
    frmAbout.Show 1
End Sub

Private Sub mnuBook_Click()
    frmBook.Show
End Sub

Private Sub mnuBookAll_Click()
    modControl.CurrReport = "DBL"
    frmReport.Show 1
End Sub

Private Sub mnuBookIn_Click()
    modControl.CurrReport = "IBI"
    frmIDReport.Show 1
End Sub

Private Sub mnuDailyIssue_Click()
    modControl.CurrReport = "DIB"
    frmCalender.Show 1
End Sub

Private Sub mnuDailyRet_Click()
    modControl.CurrReport = "DRB"
    frmCalender.Show 1
End Sub

Private Sub mnuExit_Click()
    DBCon.CloseConnection
End Sub

Private Sub mnuLMSHelp_Click()
    MsgBox "Help will be available at the time of future implementation",
vbOKOnly, modControl.msgTitle
End Sub

Private Sub mnuMemAll_Click()
    modControl.CurrReport = "DML"
    frmReport.Show 1
End Sub

Private Sub mnuMember_Click()
    frmMember.Show
End Sub

Private Sub mnuMemIn_Click()
    modControl.CurrReport = "IMI"
    frmIDReport.Show 1
End Sub

Private Sub mnuRet_Click()
    ReturnBook.Show

```

End Sub

```
Private Sub mnuTran_Click()  
    IssueBook.Show  
End Sub
```

frmMember.frm

```
Option Explicit  
Dim WithEvents rsMem As ADODB.Recordset
```

```
Private Sub cmdClose_Click()  
    Unload Me  
End Sub
```

```
Private Sub cmdDel_Click()  
    rsMem.Delete  
    rsMem.MoveLast  
End Sub
```

```
Private Sub cmdNew_Click()  
    If cmdNew.Caption = "Add New Member" Then  
        rsMem.AddNew  
        cmdNew.Caption = "Save"  
    Else  
        rsMem.Update  
        rsMem.MoveLast  
        cmdNew.Caption = "Add New Member"  
    End If  
End Sub
```

```
Private Sub cmdNext_Click()  
    If Not rsMem.EOF Then  
        rsMem.MoveNext  
    Else  
        MsgBox "You are in Last Record", vbOKOnly, modControl.msgTitle  
    End If  
End Sub
```

```
Private Sub cmdPrev_Click()  
  
    If Not rsMem.BOF Then  
        rsMem.MovePrevious  
    Else  
        MsgBox "You are in First Record", vbOKOnly, modControl.msgTitle  
    End If  
  
End Sub
```

```
Private Sub Command1_Click()  
  
End Sub
```

```

Private Sub cmdUpdate_Click()
    rsMem.Update
End Sub

Private Sub Form_Load()
    Set rsMem = New ADODB.Recordset
    rsMem.Open "select * from tblMemberDetails Order by Mbr_Idn ", DBCon.condb,
    adOpenStatic, adLockOptimistic

    Dim oText As TextBox
    'Bind the text boxes to the data provider
    For Each oText In Me.fields
        Set oText.DataSource = rsMem
    Next
    ' ##-??-## ' Medium date (US). Example: 20-May-92
End Sub

```

frmOpen.frm

```

Option Explicit

Private Sub Form_Load()

End Sub

```

frmReport.frm

```

Option Explicit
Dim crxReport As CRAXDRT.Report
Dim crxSubReport As CRAXDRT.Report

Dim crxApplication As New CRAXDRT.Application
Dim crxDATABASETable As CRAXDRT.DatabaseTable
'Dim WithEvents Section5 As craxdrt.Section
'Dim WithEvents Section3 As craxdrt.Section

Private Sub SetSubReportLoaction()
'On Error GoTo err_SetSubReportLoaction

    Dim i As Integer

    For Each crxDATABASETable In crxReport.Database.Tables
        crxDATABASETable.Location = App.Path & "\mdbs\LibraryManagementSys.mdb"
    Next crxDATABASETable

'ext_SetSubReportLoaction:
'    Exit Sub
'
'err_SetSubReportLoaction:
'    ProcessDBError
'    Resume ext_SetSubReportLoaction

```

```

End Sub

Private Sub CRViewer1_CloseButtonClicked(UseDefault As Boolean)

End Sub

Private Sub Form_Load()
    Dim curR As String, RepIndex As Integer
    curR = modControl.CurrReport

    If curR = "DIB" Then
        RepIndex = 1
    ElseIf curR = "DRB" Then
        RepIndex = 2
    ElseIf curR = "DML" Then
        RepIndex = 3
    ElseIf curR = "IMI" Then
        RepIndex = 4
    ElseIf curR = "DBL" Then
        RepIndex = 5
    ElseIf curR = "IBI" Then
        RepIndex = 6
    End If

    Set crxReport = crxApplication.OpenReport(App.Path + "\Reports\" &
modControl.RepName(RepIndex))

    crxReport.Database.Tables(1).SetLogOnInfo App.Path +
"\mdbs\LibraryManagementSys.mdb"

    SetSubReportLoaction

    If curR = "IMI" Or curR = "IBI" Then
        crxReport.ParameterFields.Item(1).ClearCurrentValueAndRange
        crxReport.ParameterFields.Item(1).AddCurrentValue modControl.RepParaID
    End If

    If curR = "DIB" Or curR = "DRB" Then
        crxReport.ParameterFields.Item(1).ClearCurrentValueAndRange
        crxReport.ParameterFields.Item(1).AddCurrentValue modControl.RepParaDate
    End If

    CRViewer1.ReportSource = crxReport
    'call form resize to view report
    Form_Resize
    CRViewer1.ViewReport
    Screen.MousePointer = 0
End Sub

Private Sub Form_Resize()
    CRViewer1.Top = 0
    CRViewer1.Left = 0
    CRViewer1.Height = ScaleHeight
    CRViewer1.Width = ScaleWidth
End Sub

```

IssueBook.frm

```
Option Explicit
Dim WithEvents rsIssue As ADODB.Recordset
Dim AddNewTran As Boolean

Private Sub cmdBookFind_Click()
    frmFindBook.Show 1
End Sub

Private Sub cmdClose_Click()
    Unload Me
End Sub

Private Sub cmdOK_Click()
    Set rsIssue = New ADODB.Recordset
    rsIssue.Open "select * from tblTransaction", DBCon.condb, adOpenStatic,
adLockOptimistic
    rsIssue.AddNew
    rsIssue.fields("Mbr_Idn ") = Val(txtMem(0).Text)
    rsIssue.fields("Bk_Idn") = Val(txtMem(1).Text)
    rsIssue.fields("Bk_Edate ") = CDate(txtMem(2).Text)
    rsIssue.Update
    AddNewTran = True
    rsIssue.MoveLast
    Unload Me
End Sub

Private Sub Form_Load()
    txtMem(2).Text = Date
    AddNewTran = False
End Sub

Private Sub Label8_Click()
End Sub

Private Sub rsIssue_MoveComplete(ByVal adReason As ADODB.EventReasonEnum,
ByVal pError As ADODB.Error, adStatus As ADODB.EventStatusEnum, ByVal
pRecordset As ADODB.Recordset)
    Dim DateRet As Date
    Dim rsRet As New ADODB.Recordset

    If AddNewTran = True Then

        DateRet = DateAdd("d", modControl.BookDays, rsIssue.fields("Bk_Edate "))

        MsgBox "Your Issue ID : " + CStr(rsIssue.fields("Trns_Idn ")), vbOKOnly,
modControl.msgTitle
        MsgBox "You haveto return book on or before " + CStr(DateRet) + ".
Otherwise you have to pay fine " + CStr(modControl.FineAmt) + " Tk. perday",
vbOKOnly, modControl.msgTitle
        AddNewTran = False
    End If
End Sub
```

```

        rsRet.Open "SELECT * FROM tblReturn", DBCon.condb, adOpenStatic,
adLockOptimistic
        rsRet.AddNew
        rsRet.fields("Trns_Idn ") = rsIssue.fields("Trns_Idn")
        rsRet.fields("Rtrn_Date ") = DateRet
        rsRet.Update

        rsRet.Close
        Set rsRet = Nothing
    End If
End Sub

```

```

Private Sub txtMem_KeyPress(Index As Integer, KeyAscii As Integer)

```

```

    If Index = 0 And KeyAscii = 13 Then

```

```

        Dim rsMemFind As ADODB.Recordset

```

```

        Set rsMemFind = New Recordset

```

```

        rsMemFind.Open "Select * from tblMemberDetails where Mbr_Idn = " &
Trim(txtMem(0).Text), DBCon.condb, adOpenStatic, adLockOptimistic

```

```

        If rsMemFind.RecordCount <= 0 Then

```

```

            MsgBox "You enter wrong member ID, Please Enter Correct Then Try",
vbOKOnly, modControl.msgTitle
            txtMem(Index).SetFocus

```

```

        Else

```

```

            Label2.Visible = True
            txtMem(1).Visible = True
            cmdBookFind.Visible = True
            txtMem(2).Visible = True
            Label3.Visible = True
            Label4.Visible = True

```

```

        End If

```

```

    End If

```

```

End Sub

```

ReturnBook.frm

```

Option Explicit

```

```

Dim rsBook As ADODB.Recordset

```

```

Dim rsMem As ADODB.Recordset

```

```

Dim rsTran As ADODB.Recordset

```

```

Dim rsReturn As ADODB.Recordset

```

```

Dim Fine As Single

```

```

Private Sub cmdClose_Click()

```

```

    Unload Me

```

```

End Sub

```

```

Private Sub cmdOK_Click()

```

```

    Dim rsFine As ADODB.Recordset

```

```

    If Fine > 0 Then

```

Else

'ReturnPart

```
Set rsReturn = New ADODB.Recordset
rsReturn.Open "Select * from tblReturn where Trns_Idn = " &
Trim(txtMem(0).Text), DBCon.condb, adOpenStatic, adLockOptimistic
rsReturn.fields("Rtrn_Date ") = Date
rsReturn.Update
```

```
Set rsTran = New ADODB.Recordset
```

```
rsTran.Open "Select * from tblTransaction where Trns_Idn = " &
rsReturn.fields("Trns_Idn "), DBCon.condb, adOpenStatic, adLockOptimistic
```

```
IssueField(0).Text = rsTran.fields("Bk_Edate ")
IssueField(1).Text = Date
```

```
days = DateDiff("d", rsTran.fields("Bk_Edate "), Date)
```

```
If days > modControl.BookDays Then
```

```
    Fine = (days - modControl.BookDays) * modControl.FineAmt
```

```
Else
```

```
    Fine = 0
```

```
End If
```

```
IssueField(2).Text = Fine
```

'Member part

```
Set rsMem = New ADODB.Recordset
```

```
rsMem.Open "Select * from tblMemberDetails where Mbr_Idn = " &
rsTran.fields("Mbr_Idn "), DBCon.condb, adOpenStatic, adLockOptimistic
memField(0).Text = rsMem.fields("Mbr_Idn ")
memField(1).Text = rsMem.fields("Mbr_Nme ")
```

' Book Part

```
Set rsBook = New ADODB.Recordset
rsBook.Open "Select * from tblBookDetails where Bk_Idn = " &
rsTran.fields("Bk_Idn"), DBCon.condb, adOpenStatic, adLockOptimistic
BookField(0).Text = rsBook.fields("Bk_Idn")
BookField(1).Text = rsBook.fields("Bk_Nme ")
BookField(2).Text = rsBook.fields("Athr_Nme ")
BookField(3).Text = rsBook.fields("Bk_Type ")
BookField(4).Text = rsBook.fields("Bk_Pblcn ")
```

```
End If
```

```
End If
```

```
End Sub
```

