

INTRODUCTION

The project titled Library Management System is Library management software for monitoring and controlling the transactions in a library .The project “**Library Management System**” is developed in ASP.Net, which mainly focuses on basic operations in a library like adding new member, new books, and updating new information, searching books and members and facility to borrow and return books.

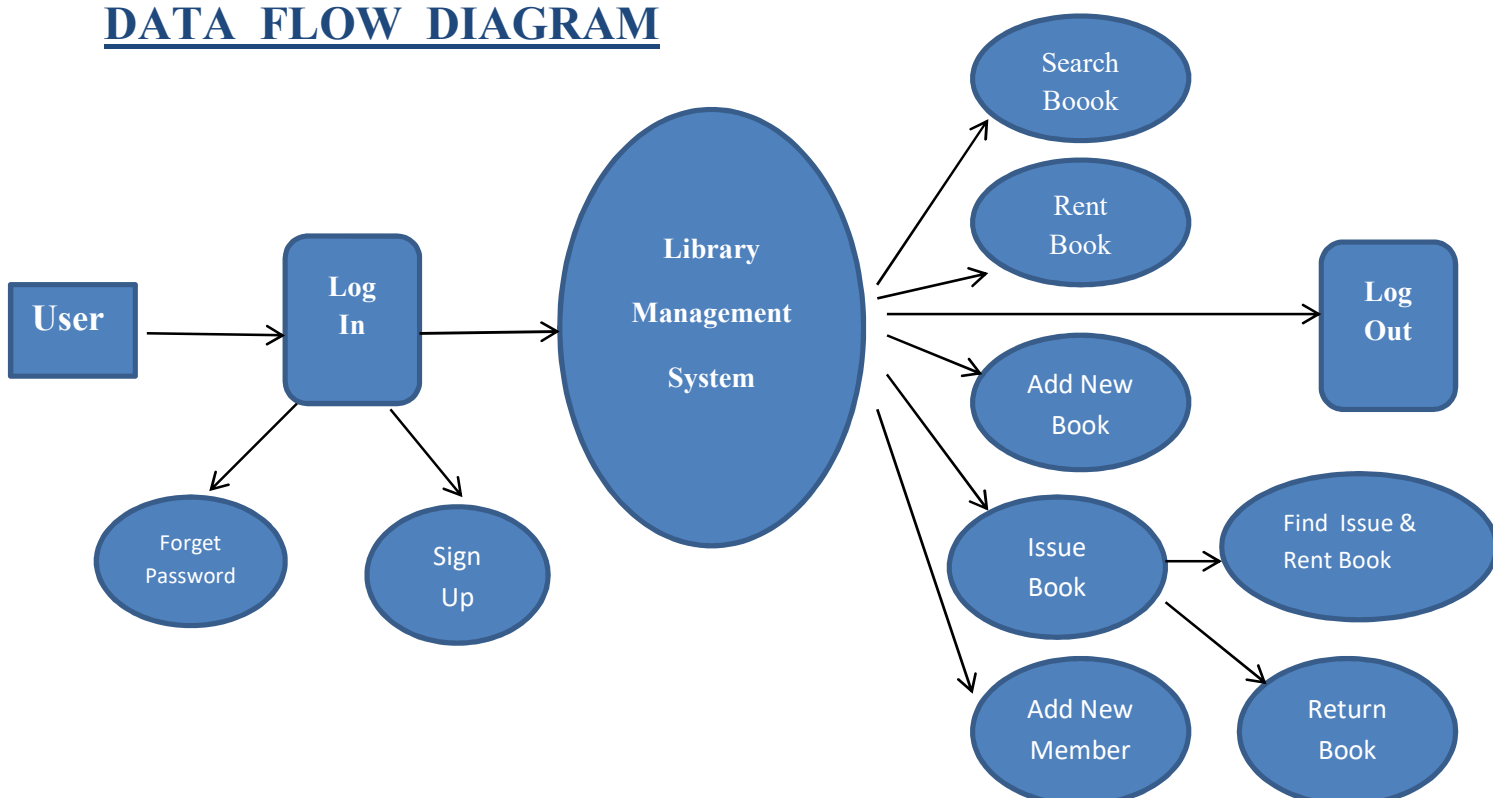
MINIUM HARDWARE CONFIGURATION

Processor : 1 GHz
RAM : 512 MB
Hard Disk : 20 GB

SOFTWARE CONFIGURATION

Operating System : Window 7 or higher
Language : .Net Framework 4.5
Database : Microsoft SQL Server 2008 R2
Web Server : IIS 7 or higher

DATA FLOW DIAGRAM



Application Architecture

This system is developed in ASP.net using .Net Framework 4.5, Entity Framework and 3 Tire Layer Architecture. Three Layers are UI layer, Business Layer and Data Access Layer. UI layer is including with .aspx file, .cs file, javascript file, css file and images file. Business layer is coordinates data between the UI Layer and Data Access Layer. Data Access Layer is access with sql database server using entity Framework.

Info folder is containing Common.cs file and CryptorEngine.cs file. Common.cs file is used for general function that using message alert function, date time function, String to Byte [] convert function, date different function and email send function. The CryptorEngine class is used only for password encryption and decryption.

DATABASE DESIGN

Book Table

Column Name	Data Type	Length	Description
Autokey	Bigint		Unique identification of the book
Bookname	Nvarchar	50	Name of book.
BookID	Nvarchar	50	Serial number of book.
ISBN	Nvarchar	50	ISBN number of book
Author	Nvarchar	50	Author Name of book
Category	Nvarchar	2	Book category
Photo	Varbinary	Max	Image of book.

Book Rent Table

Column Name	Data Type	Length	Description
Autokey	Bigint		Unique identification of the rent book
MemberId	Nvarchar	50	Member id of book renter.
BookID	Nvarchar	50	Book ID of rent book.
StartDate	Date		Start rent date.
EndDate	Date		End rent date.
CategoryId	Nvarchar	2	Book category
NumberOfDay	Int		Rent total day.
Status	Int		Rent or return status (0=return, 1=rent)

Book Category Table

Column Name	Data Type	Length	Description
Category_Id	Bigint		Unique identification of category
Category_Name	Nvarchar	50	Book Category Name

User Member Table

Column Name	Data Type	Length	Description
Autokey	Bigint		Unique identification of the member
MemberID	Nvarchar	50	Serial Number of member
MemberName	Nvarchar	50	Member Name
Phone	Nvarchar	50	Phone number
Email	Nvarchar	50	Email address of member
Address	Nvarchar	50	Member Address
City	Nvarchar	50	City
Password	Nvarchar	50	Member password
RoleID	bigint		User Role ID
Active	Nvarchar	2	Active of not active user status (1=active , 0=not active)

User Role Table

Column Name	Data Type	Length	Description
Autokey	Bigint		Unique identification of the role
RoleName	Nvarchar	50	Name of Role.

Using Store Procedure

Search Procedure for Book

```
ALTER PROCEDURE [dbo].[SearchBook]
(
    @BookName      varchar(30) = null,
    @Author        varchar(30) = null,
    @Category      varchar(30) = null
)
AS
BEGIN
    DECLARE @query    nvarchar(1000);

    SET @query = 'SELECT autokey,ISBN,BOOKNAME,AUTHOR,b.CATEGORY_NAME AS CATEGORY,
                    BOOKID,PHOTO FROM Book e
                    INNER JOIN CATEGORY b on e.category = b.category_id'
    SET @query = @query + ' WHERE 1=1'

    IF @BookName != ''
        SET @query = @query + ' AND e.BookName LIKE ''' + @BookName + '%'''

    IF @Author != ''
        SET @query = @query + ' AND e.Author LIKE ''' + @Author + '%'''

    IF @Category !=0
        SET @query = @query + ' AND e.Category = ' + @Category

    EXEC (@query)
END
```

Search Procedure for Member

```
ALTER PROCEDURE [dbo].[SearchMember]
(
    @FirstName      varchar(30),
    @City           varchar(30)
)
AS
BEGIN
    DECLARE @query    nvarchar(1000)

    SET @query = 'SELECT autokey,MEMBERID,MemberName ,
                    Phone,email, Address ,City,password,RoleId,email,active FROM member e'
    SET @query = @query + ' WHERE 1=1'

    IF @FirstName != ''
        SET @query = @query + ' AND MemberName LIKE ''' + @FirstName + '%'''

    IF @City != ''
        SET @query = @query + ' AND City LIKE ''' + @City + '%'''

    EXEC (@query)
END
```

Search Procedure for Rent Book and Issue Book

```
ALTER PROCEDURE [dbo].[SearchRentBook]
(
    @BookName          varchar(30) = null,
    @MemberName        varchar(30) = null,
    @Category           varchar(30) = null,
    @IsIssueBook        varchar(30) = null,
    @IsRentBook         varchar(30) = null
)
AS
BEGIN
    DECLARE @query      nvarchar(1000);

    SET @query = 'SELECT b.autokey,m.MemberName as memberId,b.StartDate,b.IssueDate,a.BookName as bookId,
        c.Category_Name as CategoryId,b.NumberOfDay,b.status
        FROM Book a, BookRent b, member m, Category c
        WHERE b.BookId= a.autokey
        AND b.MemberId = m.autokey
        AND b.CategoryId = c.Category_Id
        AND b.status = 1'

    SET @query = @query + ' AND 1=1'

    IF @BookName != ''
        SET @query = @query + ' AND a.BookName LIKE ''' + @BookName + '%'''

    IF @MemberName != ''
        SET @query = @query + ' AND m.MemberName LIKE ''' + @MemberName + '%'''

    IF @MemberName != ''
        SET @query = @query + ' AND m.MemberName LIKE ''' + @MemberName + '%'''

    IF @Category !=0
        SET @query = @query + ' AND b.categoryid = ' + @Category

    IF (@IsRentBook = 1 and @IsIssueBook =0)
        SET @query = @query + 'AND convert(char(26), getdate(), 103) BETWEEN convert(char(26), b.StartDate, 103)
            AND convert(char(26), b.IssueDate, 103)'
    ELSE IF (@IsIssueBook = 1 and @IsRentBook = 0)
        SET @query = @query + 'AND convert(char(26), b.IssueDate, 103) < convert(char(26), getdate(), 103)'

    EXEC (@query)
END
```