

Library Management System- System Architecture

1) Introduction

a) Document overview

This document provides the architecture of Library Management System. It provides a Library management system that can be accessed by any librarian to

- Search for any Book given any part or full
 - ISBN number of the book
 - Title of the Book
 - Author of the Book
- Check out any book given the Card number of the borrower and any combination of ISBN number of the book, Title, and Author and
- Check in any book given the Card number or Name of the borrower, or ISBN (13 digit) of the book
- Create a new borrower account by giving the unique SSN, full name, Address (Street, City, State), Email ID and phone number of the person.
- Update the Fines table to calculate the fine on books borrowed and past its due date.
- Display the record of previous borrowed books that have fines (if any) and status of the fine i.e. either paid or not.
- Payment of cumulative fines on all books of a borrower. Fines can be viewed as individual fines on each book or as a cumulative fine for each borrower. Librarian can filter Paid and Unpaid Fines for each borrower.

2) Architecture

b) Architecture overview

The System can perform all the above-mentioned tasks which are required by a librarian to be performed.

- It is intended to be used by a library administrator or librarian for short.
- The system helps in providing a mechanism to maintain records of books, their borrowers, and the intended fine (if any), and provide consistency with physically recorded activities.

The main functions provided are:

- Search for any book
- Check out a given book
- Check in the borrowed book
- Create a new borrower account
- Calculate and charge fine on late returned/unreturned books by the borrowers.

c) Dynamic Behavior of Architecture

Work Flow/Sequence

- Search for any Book

Performs search for a book given any combination of book's ISBN number, author's name or name of the book. It also takes input any substring of any given input and retrieves all the records that match that substring.

- Create a new Borrower

Creates a new borrower given the persons SSN number, full name, address (Street, city, state), Email and phone number.

- Check Out any book

For an existing borrower, System taken in the borrowers Card id and Name to allow borrower to borrow any book by searching for a book using the book's ISBN number, title or author's name. This input can be a substring of details to search for book to be checked out.

- Check In borrowed book

Accept the book returned given any one or all of card number of the borrower, ISBN number of the book or borrower's name. It calculates and updates fine records if the book is returned beyond the due date.

- Display Fine

Displays the information on fine on each book and also the cumulative fine on each person. The updates happen every day using a Batch script that runs in background and calculates fine based on difference of Due Date and Check-in Date.

- Pay Fine

The borrower can pay all the cumulative pending fine of all books on his account

d) Design Decisions

- A Home page exists from where we can navigate to any of the above options- Search, Borrow, Return Books and Pay Fine. Each option has its own home page which can be accessed by pressing the button for the respective option.
- System is designed in a way that a borrower must first log in using his Card Id and Name (to ensure legitimate check-out of a book) to borrow a book.
- The borrower cannot pay a fine unless he has returned that book.
- The borrower is required to pay the cumulative fine of all books at once.
- Updates are made to the database as per the requirements of the system design.

e) Assumptions

- The software runs as a web application and requires a browser and an internet connection to access the all the facilities of the Library Management System.
- The system is assumed to run on a Windows as it requires a Batch script to be executed automatically once every day.
- ISBN Number of the book is assumed to be of 13 digits.
- The borrower should have a valid SSN to borrow a book.