# **High Level Design Document**

# **Library Management System:**

It is designed for managing and maintaining libraries in any educational institution through an integrated computerized system. The library management software will allow librarians to operate more productively while handling the typical day-to-day tasks of a library.

In a traditional library management system, everything is done manually. All the library operations and records, including the number of books, genres of books, names of books, records of the students who’ve issued/returned books, etc., are all done via pen and paper. Naturally, this process requires a significant amount of time, effort, and even human resources. The proposed project seeks to solve all the challenges associated with the traditional library management system. Since it stores and manages all the library records in a computerized database, it eliminates the need for manual record-keeping. The software includes different modules, each of which handles and manages specific library operations. By using this software application, librarians and students need not search the entire library to find a book. They can enter the name and author of the book, and the system will display the list of all the possible books available for that search keyword/phrase. This is one of the best features of this library management software.

## HIGH-LEVEL LOGICAL ARCHITECTURE FOR A LIBRARY MANAGEMENT SYSTEM

User Interface:

This layer provides the graphical user interface for the library management system. It allows users to interact with the system to perform various operations, such as searching the catalog, borrowing books, and managing their accounts.

Application Services:

This layer provides the business logic and data access services for the library management system. It encapsulates the core functionality of the system, such as cataloging, circulation, reservation, and User Management.

Data Storage:

This layer provides the data storage and management services for the library management system. It stores all the data related to the library, such as book information, user accounts, circulation history, and other administrative data.

Integration Services:

This layer provides the integration services for the library management system. It integrates with other systems, such as User Management Module, Search and Retrieval Module, and other library-related systems.

Security and Authentication:

This layer provides the security and authentication services for the library management system. It ensures that all user data and library resources are protected and secure.

System requirements for a Library Management System using TIBCO BusinessWorks:

Operating System: Windows or Linux operating system (depending on the preferred platform)

TIBCO BusinessWorks: TIBCO BusinessWorks (version 6.x) must be installed on the system.

Database: A relational database such as Oracle Server for storing library data and metadata.

## THE FOLLOWING ARE SOME OF THE MAIN MODULES OF THE LIBRARY MANAGEMENT SYSTEM:

The LMS will be created using Tibco BusinessWorks 6.x.x

Cataloging Module:

This module is responsible for adding new books, updating book information, and assigning unique identifiers to each book. It also manages the classification and indexing of library materials.

Circulation Module:

This module is responsible for managing the borrowing and returning of books, including issuing library cards to patrons, recording due dates, sending overdue notices, and managing fines and fees.

Reservation Module:

This module allows patrons to reserve books that are currently checked out and be notified when the book is available.

Search and Retrieval Module:

This module allows patrons to search for books in the library catalog and locate the book on the shelves.

User Management Module:

This module manages user accounts, including creating and deleting accounts, updating user information, and setting user permissions.

## PROCESS DESIGN:

CATALOGING MODULE:

process design for the Cataloging module in a Library Management System:

This process design outlines the steps involved in adding new books, updating book information, and assigning unique identifiers to each book in a Library Management System.

ADD Books:

Collect Book Information: The librarian collects all necessary information about the book, including the title, author, publisher, publication date, edition, and ISBN.

Create Book Record: Using the collected information, the librarian creates a new record for the book in the Library Management System, including assigning a unique identifier to the book.

Enter Book Information: The librarian enters all the book information into the system, including the title, author, publisher, publication date, edition, and ISBN. The system validates the information to ensure that all required fields are filled and that the ISBN is in the correct format.

Add Copies: If the library has multiple copies of the book, the librarian adds the number of copies to the book record in the system.

Review and Approve: The librarian review’s the information entered into the system and approves the record if everything is accurate and complete.

Update Book Information:

If any changes are made to the book information, such as a new edition or updated author information, the librarian updates the book record in the system.

Remove Books:

If a book is lost, damaged, or withdrawn from the collection, the librarian removes the book record from the system.

CIRCULATION MODULE:

This process design outlines the steps involved in managing the borrowing and returning of books, including issuing library cards to patrons, recording due dates, sending overdue notices, Check In Books in a Library Management System.

process design for the Circulation module in a Library Management System:

Register Patrons: The librarian registers patrons and issues library cards with unique identifiers to track their borrowing history.

Check Out Books: When a patron wants to borrow a book, the librarian scans the patron's library card and the book's barcode to check out the book.

Record Due Date: The system records the due date for each borrowed book based on the library's borrowing policies and the patron's borrowing history.

Renew Books: If a patron wants to renew a borrowed book, the librarian extends the due date in the system, provided there are no holds on the book.

Send Overdue Notices: The system automatically sends overdue notices to patrons who have not returned their borrowed books by the due date.

Check In Books: When a patron returns a book, the librarian scans the book's barcode to check it in and update the book's status in the system.

RESERVATION MODULE:

This process design outlines the steps involved in allowing patrons to reserve books that are currently checked out and be notified when the book is available in a Library Management System.

process design for the Book Reservation module in a Library Management System:

Reserve book: Patrons search the library catalog to find books they want to reserve, and the system displays the availability of the book.

Place a Hold: If a book is checked out, patrons can place a hold on the book in the system by clicking a button or selecting a menu option.

Verify Patron Information: The system verifies that the patron has a valid library card and that their contact information is up to date.

Record Reservation: The system records the patron's reservation in the system, including the book title, the patron's contact information, and the date the hold was placed.

Notify Patrons: When a reserved book is returned, the system automatically sends notifications to the patrons in the reservation queue, informing them that the book is available for pickup.

SEARCH AND RETRIEVAL MODULE:

This process design outlines the steps involved in allowing patrons to search for books in the library catalog and locate the book on the shelves in a Library Management System.

process design for the Book Search module in a Library Management System:

Search Catalog: Patrons search the library catalog by entering keywords, author name, title, subject, or other search criteria.

Display Results: The system displays a list of books matching the search criteria, along with information about the book such as title, author, publisher, publication date, and availability status.

Filter Results: Patrons can filter and sort the search results based on various criteria such as author, publication year, subject, and availability status.

Check Book Availability: Patrons can check the availability of a book in the library by viewing its status, location, call number.

Locate Book: If a book is available, patrons can use the call number to locate the book on the shelves.

Manage Reservations: If a book is checked out, patrons can place a hold on the book and be notified when the book is available.

USER MANAGEMENT MODULE:

This process design outlines the steps involved in managing user accounts in a Library Management System.

process design for the User Management Module in a Library Management System:

Create Account: A librarian creates a new user account by entering the user's information, such as name, address, email, and phone number, into the system.

Verify Account: The system verifies the user's information and checks for any duplicate or conflicting records.

Assign User Roles: The librarian assigns a role or permission level to the user based on their job function or responsibilities, such as librarian, student, faculty.

The system sets permissions for each user based on their role, such as the ability to check out books, add new books.

Manage User Information: The system manages user information, including updating user profiles, resetting passwords, and deleting accounts.

## DATABASE STORAGE:

Database design for a Library Management System:

This database design provides a comprehensive data storage and management solution for a Library Management System, with separate tables to store information on books, users, circulation, categories, publishers, authors, staff, and transactions.

Book Table: This table stores all the information related to books in the library, such as book title, author, publication date, ISBN, and number of copies.

User Table: This table stores all the information related to library patrons, such as name, address, email, phone number, and account status.

Circulation Table: This table tracks the borrowing and returning of books, including the borrower's name, the book title and ISBN, the checkout and due dates, and the return date.

Category Table: This table stores information on book categories or genres, such as fiction, non-fiction, biography, and history.

Publisher Table: This table stores information on book publishers, including the publisher’s name, address, and contact information.

Author Table: This table stores information on book authors, including the author's name, contact information, and list of published works.

Staff Table: This table stores information on library staff, including name, job title, email, and phone number.

Transaction Table: This table stores all the transactions related to the library management system, including data related to book reservations, cancellations, and other administrative tasks.