

### 1. Current State Analysis:

The City Library system currently uses an electronic card catalog for book information but relies on paper records for member information and book check-in/check-out.

The current system was suitable when the number of registered members was low but needs to be updated due to a growing population.

### 2. New System Objectives:

Implement a web-based application for librarians to automate book check-in and check-out.

Maintain information about publishers for ordering new books.

Allow library members to search for books in the electronic card catalog.

Restrict library membership to valid City of Fairfield residents with valid identification.

Define different borrowing rules and fees for standard members, staff members, and senior citizens.

Keep track of member fees and prevent further checkouts if fees exceed 100 cents.

### 3. Key Entities:

Library: Represents a library branch with attributes like name, location, and catalog.

Book: Represents a book with attributes like bookId, ISBN, title, author, publisher, description, subject, and availability status.

Member: Represents a library member with attributes like memberId, name, address, phoneNumber, feePaymentInfo, and senior status.

Librarian: Extends Member and represents library staff.

Publisher: Represents a book publisher with attributes like publisherId, name, address, and phoneNumber.

PaymentInfo: Contains payment-related attributes like cardNumber, cardHolderName, expirationDate, and balance.

CheckoutRecord: Records book checkouts with attributes like memberId, bookId, dueDate, returnDate, and overdueFee.

### 4. Business Rules:

Only valid City of Fairfield residents with valid identification cards can become library members.

Different borrowing rules apply to standard members, staff members, and senior citizens regarding loan duration and overdue fees.

Members must not be allowed to check out new books if they have overdue books or owe more than 100 cents in fees.

### 5. Functional Requirements:

Implement a web-based application for librarians to check-in and check-out books.

Maintain a catalog of books with details like author, title, publisher, description, and location.

Store member information, including addresses, phone numbers, and payment options.

Enable members to search the electronic card catalog for books.

Calculate and track overdue fees for books.

Manage payments and balances for member fees.

Provide different borrowing durations for standard members, staff, and senior citizens.

Restrict access to book check-in and check-out functions to librarians.

#### 6. Non-Functional Requirements:

The system should be web-based, accessible through web browsers.

Ensure data security and privacy, especially for payment information.

The system should be responsive and user-friendly.

It should be hosted either on a library server or a cloud service.

#### 7. Use Cases:

Register Member

Search Catalog

Check Out Book

Check In Book

Calculate Overdue Fees

Manage Payments

Verify Member Eligibility

#### 8. Constraints:

The system must adhere to data protection laws and regulations.

The web application should be compatible with modern web browsers.

The system should be scalable to accommodate the growing population.

#### 9. Assumptions:

It is assumed that the library already has access to the necessary infrastructure (e.g., internet connectivity, computers) for the web-based system.