Smart Public Library System — Business Requirements

The **City Knowledge Resource Centre (CKRC)** is a network of public libraries managed by the municipal council of Metrovale City. It serves thousands of members with traditional and digital book services across the city. In order to modernize operations, CKRC has proposed the development of a **Smart Public Library System (SPLS)** to allow seamless access to library services. The system will serve users (members), librarians, and administrators. Below are the detailed business requirements:

1. User Registration and Profile Management

Any resident of Metrovale City can register for a library account online using their NIC and email address (email is mandatory). A verification email is sent during registration. Once registered, the user can:

- View and update personal details (address, contact info)
- Upload a profile picture in specified dimensions and format
- Change password securely
- Link dependents (e.g., children) to their main account for joint family accounts

Each library account is unique to one email address and NIC.

2. Library Membership Management

After registration, the user may apply for a membership type:

- Basic (Free)
- Premium (Paid)
- Family (Paid)

Each membership type has different borrowing limits and service access. Users can pay online or offline (via voucher upload). The membership status is shown in the portal (pending, approved, expired, etc.). A PDF membership card with a QR code can be downloaded upon approval.

3. Book Search and Reservation

Users can:

- Search the catalog using various filters (author, title, genre, year)
- See real-time availability at nearby branches
- Reserve a book for pickup at a preferred branch
- Set a "Hold Duration" (max 3 days). Failure to collect cancels the reservation
- View their reservation history and status

Librarians are notified to hold the book when a reservation is made.

4. Borrowing and Returning Books

Users can borrow physical books in person or request a home delivery (premium/family members only). For each transaction:

- A digital receipt is generated
- Due dates are clearly shown
- Late returns incur fines (visible in the user dashboard)
- Users can extend borrowing (once per book)

Books returned late are automatically flagged, and fine amounts are calculated by the system.

5. E-Books and Audiobooks Access

Premium and family members can:

- Stream or download digital content (PDF/ePub/MP3)
- Use the in-browser reader/audio player
- Bookmark and annotate (bookmarked data is saved per user)
- Access their digital library history

Content access is protected via DRM integration and limited to the membership duration.

6. Events and Workshops

CKRC organizes regular reading clubs, author meetups, and coding workshops. Users can:

- Browse and filter upcoming events by date or category
- Register online (limited seats)
- Receive e-tickets with QR codes
- Cancel attendance up to 48 hours before the event

Admins manage capacity and send confirmation messages.

7. Feedback and Reporting System

Users can submit:

- Feedback on books or services
- Reports on damaged/lost items
- Suggestions for new books/events

The feedback module supports direct messaging with librarians.

8. Messaging System

Admins/librarians can:

- Send general announcements (e.g., library closures, new arrivals)
- Notify users about reservations, due dates, fines, and events
- Send group messages to specific categories (premium users, members of a branch, etc.)

Messages appear in the portal and are emailed to users.

9. Fine Payment and Invoice Management

Fines and membership fees can be paid:

- Via online payment (card, UPI)
- By uploading a scanned copy of the bank deposit slip

Invoices are generated and downloadable as PDF. Users can view payment history, including invoice numbers, dates, and descriptions.

10. Renewals and Expiry Notifications

Memberships are valid for one calendar year. The system:

- Notifies users 30 days before expiry
- Allows early renewal (with discounts applied automatically if applicable)
- Blocks book reservations and digital content after expiration until renewed

A grace period of 7 days is given before account deactivation.

11. Library Staff Portal

Librarians can:

- Manage physical inventory
- View and approve reservations
- Track books issued/returned
- Register and manage event attendees
- Send custom messages to users
- Add new books to the catalog (with metadata and cover image)

Staff must log in with staff credentials. Certain roles (head librarian, admin) have additional permissions.

12. Inventory and Stock Management

The system maintains a real-time inventory of:

- Total copies available per title

- Book conditions (good, damaged, needs repair)

- Locations across branches

Automated reports are generated weekly to flag low-stock or damaged books.

13. User Analytics and Reports

Users can view:

- Their reading statistics (number of books read, genres preferred)

- Time spent on digital resources

- Monthly borrowing history

Admins can use anonymized analytics for decision-making and improvements.

14. System Notifications and Alerts

- Alerts for overdue books, fines, reserved books, event reminders, system downtime, and new feature launches

- Alerts are visible in both the dashboard and email

15. System Integration and Security

The system must integrate with:

- National ID verification API

- Municipal payment gateway

- CKRC internal HR system (for librarian profiles)

Security features include:

- Role-based access control

- Two-factor authentication

- End-to-end encryption for sensitive transactions