## **Level 0 (Context Diagram) - Outline**

The **Level 0 DFD (Context Diagram)** represents the **Library Management System** as a single process interacting with external entities.

### ****Entities & Data Flow in Level 0:****

* **External Entities:**
  1. **User** (Registers, Logs in, Browses Books, Purchases, Borrows)
  2. **Admin** (Manages Books, Views User History)
* **Main System:**
  1. **Library Management System**
* **Data Flow:**
  1. **User → Sign Up/Login → Library System**
  2. **User → View Books → Library System**
  3. **User → Borrow/Purchase Book → Library System**
  4. **Admin → Add/Delete Books → Library System**
  5. **Library System → Store/Retrieve Data → MongoDB**

### ****DFD Structure (Level 0)****

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| External Entity: User |

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| Library Management System |

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| External Entity: Admin |

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| Data Store: MongoDB |

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## **Level 1 (Detailed DFD)**

At **Level 1**, we break down the **Library Management System** into its major **sub-processes**.

### ****Processes & Data Flow in Level 1:****

#### **1. User Registration & Authentication**

* **User signs up**, and credentials are stored in **MongoDB**.
* After signup, an **alert** confirms successful registration, and the user is redirected to the **login page**.
* User logs in using registered credentials.
* If credentials are invalid, an error message is displayed.
* Upon successful login, the user is redirected to the **book showcase**.

#### **2. Admin Authentication & Management**

* **Admin logs in directly**.
* Admin accesses the **Admin Dashboard** to:
  + **Add Books**
  + **Delete Books**
* Data is stored in **MongoDB**.

#### **3. Book Showcase & User Interaction**

* After login, the user accesses the **book showcase**.
* All **book categories** are displayed.
* User can:
  + **View book details**
  + **Add a book to the cart**
  + **Remove a book from the cart**

#### **4. Book Purchase & Borrowing**

* When the user purchases a book, the **cart is updated**, and the **order is stored in MongoDB**.
* After payment, the user is redirected to the **Products Page**.

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| External Entity | | External Entity |

| User | | Admin |

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| Process: 1.1 - Signup | | Process: 2.1 - Admin |

| Store in MongoDB | | Login |

+-----------------------+ +-----------------------+

+---------------------------+ +-----------------------+

| Show | | Process: 2.2 - Manage|

| Signup Success Alert| | Books & Users |

+----------------------------+ +----------------------------+

+----------------------------+ +---------------------------+

| Redirect | |Data Store: MongoDB|

| to Login Page | | Books |

+----------------------------+ +--------------------------------+

+----------------------------+

| User |

| Enters Login Info |

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| Process: 1.2 - Login |

| Validate User |

+-----------------------+

+----------------------------------+

| Decision: Credentials Valid? |

+--------------------------------------------+

yes No

+----------------------+ +----------------------+

| Redirect | | Show |

| to Home Page | | Invalid Credentials |

+----------------------+ | Alert Message |

+----------------------+

+-----------------------+

| Process: 1.3 - Browse | +------------------------+

| Books & Categories | | Redirect to signup |

+-----------------------+ | Page |

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| Process: 1.4 - Add/ |

| Remove from Cart |

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| Process: 1.5 - Purchase |

| & Payment Processing |

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| Redirect to Product |

| Page |

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\*Admin Dashboard (Use Case Diagram) \*

- Login

- Add Books

- Delete Books

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| Admin |

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[Login] [Add Book] [Delete Book]

\*User Signup & Login (Use Case Diagram)

- Register

- Login

- Redirect to Login if User Exists

- Stay on Signup if New User

- Redirect to Homepage After Successful Login

+--------------------------+

| User |

+--------------------------+

[Signup] [Login] [Redirect to Home]

\*Book Showcase & User Interaction (Use Case Diagram) \*

- Browse Books

- Add to Cart

- Remove from Cart

- View Book Details

+--------------------------+

| User |

+--------------------------+

[Browse Books] [Add to Cart] [View Book Details]

\*Book Purchase (Use Case Diagram)

- Purchase Book

- Return Book

+--------------------------+

| User |

+--------------------------+

[Purchase] [Return]

# Conclusion:

This document provides:

- Level 0 & Level 1 DFD Diagrams

- Use Case Diagrams for Major Pages

- Data Flow and System Interaction Details

This serves as a blueprint for implementing a Library Management System using **React, MongoDB, and Routing** for authentication and book interactions.