

Business Report: Library Management System

Introduction

This report outlines the design and purpose of a Library Management System as visualized in the provided Entity-Relationship Diagram (ERD). The system is designed to efficiently manage books, authors, library members, and borrowing activities within a library.

Objectives

1. **Efficient Record Keeping:** Maintain detailed records of books, authors, library members, and borrowing transactions.
 2. **Seamless Borrowing Process:** Enable members to borrow and return books with proper tracking.
 3. **Data Integrity:** Ensure relationships among entities are logically organized to avoid redundancy and maintain accuracy.
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Entities and Their Roles

1. Book

- **Attributes:**
 - **ID:** Unique identifier for each book.
 - **Name:** Title of the book.
 - **ISBN:** International Standard Book Number for book identification.
 - **Published Year:** Year of publication.
 - **Author ID:** Identifier linking the book to its author.
- **Relationships:**
 - A book is linked to one author through the **has** relationship.
 - A book can be borrowed by members through the **borrow** relationship.

2. Author

- **Attributes:**
 - **ID:** Unique identifier for each author.
 - **First Name (fname):** Author's first name.
 - **Last Name (lname):** Author's last name.
 - **Date of Birth:** Author's birthdate for additional record details.
- **Relationships:**
 - An author is associated with one or more books via the **has** relationship.

3. Members

- **Attributes:**
 - **Membership ID:** Unique identifier for each member.
 - **First Name (fname):** Member's first name.
 - **Last Name (lname):** Member's last name.
 - **Telephone Number (tele_num):** Contact number.
 - **Membership Date:** Date the member joined the library.
- **Relationships:**
 - Members can borrow books through the **borrow** relationship.

4. Borrow

- **Attributes:**
 - **ID:** Unique transaction identifier for borrowing records.
 - **Book ID:** Identifier linking the record to the borrowed book.
 - **Member ID:** Identifier linking the record to the member borrowing the book.
 - **Loan Date:** Date the book was borrowed.
 - **Return Date:** Date the book was returned.
 - **Relationships:**
 - This entity connects the **members** and **book** entities and manages the borrowing process.
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Relationships

1. **Book and Author:**
 - A book has only one author, and an author can write multiple books (one-to-many relationship).
 - This relationship is managed by the **has** connector.
 2. **Book and Borrow:**
 - A book can be borrowed multiple times by different members over time (one-to-many relationship).
 3. **Members and Borrow:**
 - A member can borrow multiple books, creating a one-to-many relationship.
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System Workflow

1. **Adding Book**
 2. **Removing Books:**
 3. **Registering Members:**
 4. **Removing Members:**
 5. **Borrowing Process:**
 6. **Viewing Members:**
 7. **Viewing Books:**
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Benefits

1. **Streamlined Operations:** Reduces manual effort in tracking books and members.
2. **Enhanced Data Accuracy:** Proper relationships ensure no duplication or data loss.
3. **Improved Member Experience:** Quick access to borrowing history .