PROJECT REPORT

ON

LIBRARY MANAGEMENT SYSTEM

SUBMITTED TO	**SUBMITTED BY**
Mr. Anuj Kumar	Anshika Soni(AF04991159)
	Khushi Krishna(AF04991215)
	Kanika Chaudhary(AF04971772)

Batch code :-
ANP- D2405

Course name:-
ITPR

DR. K. N. MODI INSTITUTE OF ENGINEERING AND TECHNOLOGY

Academic Year: 2025 – 2026

ABSTRACT :-

The **Library Management System** is a terminal-based software application developed using **Core Java, JDBC, and MySQL**.
The purpose of this project is to automate the process of managing library operations such as maintaining book records, member information, and issue-return transactions.

Manual library management is time-consuming, error-prone, and inefficient. This system provides a computerized solution to store, update, delete, and retrieve library-related data efficiently and accurately.

INTRODUCTION :-

Libraries handle a large amount of data related to books, members, and transactions. Managing this information manually becomes difficult as the number of users and books increases.

The **Library Management System** addresses these issues by providing a reliable and structured system for managing library resources.
The system uses **Java** as the core programming language, **JDBC** for database connectivity, and **MySQL** as the backend database. It ensures data accuracy, fast retrieval, and efficient management through a terminal-based interface.

OBJECTIVES :-

- To automate library management operations
- To reduce paperwork and manual errors
- To maintain a centralized database of books and members
- To manage issue and return of books efficiently
- To demonstrate CRUD operations using JDBC
- To improve accuracy and efficiency

PROJECT CATEGORY :-

This project belongs to the **Database Management System (DBMS)** category.

It is a terminal-based application developed using **Core Java**.

JDBC is used to connect Java with the **MySQL** database.

The project demonstrates **Create, Read, Update, and Delete (CRUD)** operations.

SYSTEM ANALYSIS :-

System analysis involves understanding user requirements and designing a system that fulfills those needs.

The **Library Management System** is designed to manage books, members, and issue-return transactions efficiently.
The system is divided into different modules to simplify functionality and improve maintainability.

MODULES DESCRIPTION :-

1. **Book Management**

   Add, update, view, and delete book records

2. **Member Management**

   Add, update, view, and delete library members

3. **Issue-Return Management**

   Issue books to members and manage book returns

4. **Category Management**

   Manage book categories

5. **Transaction Management**

   Maintain issue and return history

DATABASE DESIGN :-

The database is designed using **MySQL**.
It consists of tables such as:

- Books
- Member
- Category
- Issue_Return
- Book_Transaction_Relation

Each table is designed with proper **primary keys** and **foreign keys** to maintain data integrity and relationships.

ENTITY RELATIONSHIP DIAGRAM :-

The **ER Diagram** represents relationships between entities such as **Book, Member, Category, and Issue_Return**.
It shows one-to-many relationships where one member can issue multiple books.

DATA FLOW DIAGRAM :-

The **Data Flow Diagram (DFD)** illustrates how data flows within the system.

- Zero Level DFD
- First Level DFD
- Second Level DFD

It shows interaction between user, system, and database.

PROCESS LOGIC :-

The system follows a simple process logic:

1. User selects an operation from the menu
2. Input is taken through terminal
3. Data validation is performed
4. Database operation is executed
5. Output is displayed to the user

PLATFORM USED :-

Hardware Requirements :

- Intel i3 or higher
- 4GB RAM
- 500MB Storage

Software Requirements :

- JDK 8 or above
- MySQL Server
- Eclipse IDE
- JDBC Driver

IMPLEMENTATION DETAILS :-

The project is implemented using a layered architecture.
The **DAO (Data Access Object)** pattern is used to separate business logic and database operations.

Prepared Statement is used to prevent SQL injection.
Exception handling ensures system stability and error handling.

TESTING :-

Testing ensures that the system works as expected.
Unit testing is performed on each module.

Test cases include:

- Adding books and members
- Issuing and returning books
- Viewing records

All modules were tested successfully.

RESULTS :-

The **Library Management System** successfully manages library records.
It provides fast data retrieval, secure storage, and accurate transactions.
The terminal-based interface is user-friendly and efficient.

ADVANTAGES :-

- Easy to use
- Reduces paperwork
- Accurate data management
- Secure and reliable
- Scalable system

LIMITATIONS :-

- Terminal-based interface
- No graphical user interface
- Limited user roles

FUTURE SCOPE :-

- GUI-based system using JavaFX or Swing
- Web-based application
- Role-based access control
- Online book reservation
- Fine calculation system

CONCLUSION :-

The **Library Management System** successfully automates library operations.
It demonstrates the practical implementation of **Java, JDBC, and MySQL**.
The project fulfills all objectives and provides a strong base for future enhancements.

THANK YOU