DESIGN DOCUMENT

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INTRODUCTION

Library Management System is designed to be used by librarians for performing operations related to the Library management. The functionality of the system are but not limited to searching for a book, check out one or more books, checking in borrowed books, adding new borrower, querying the fine amount and paying the fine amount for each book that the borrower has checked out and missed the due date to turn in the book. The borrower who misses the due date is fined for an amount of 25 cent (0.25 US Dollars) per day for each book.

The design of system is based on Java Server Faces (JSF) which is based on Model-View-Controller Architecture (MVC). It provides the front end web interface to the user to communicate with the system. The controller helps to navigate between views as per the model. The model takes care of interacting with the back end database to execute the queries and process the results from the database. MySQL is chosen as the database to support Back-end operations.

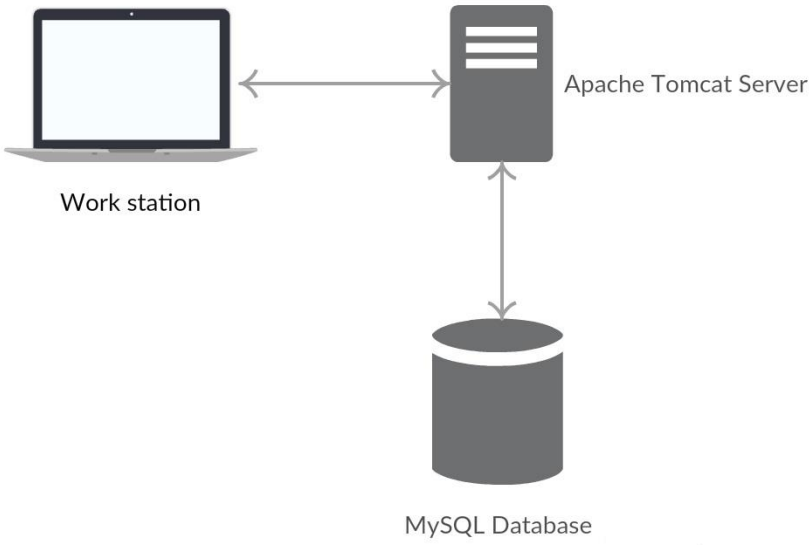

Figure 1 Topology Diagram

DESIGN

The Library Management system has been augmented with fields that are required for performing the functional requirements of the project. However the revised schema is designed in such a way that it will backward compatible. The revised library schema is presented in the next page.

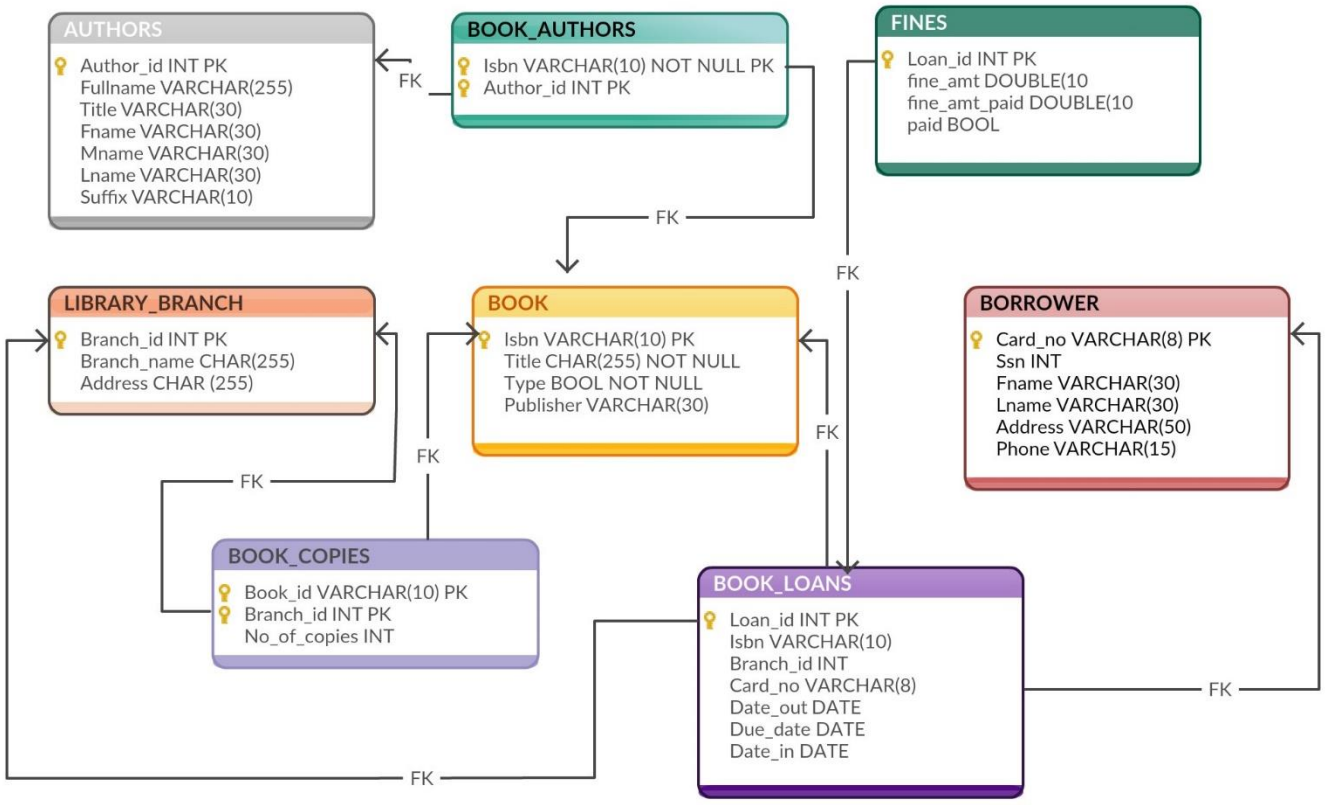

Figure 2 Library Database Schema

Model

The Model component is responsible for invoking the Data Access Object (DAO) classes to access the Database. The connection between the database and the web application takes place in this module. This module handles the queries that is to be executed in the database, executes them and handles the result set from the database which can be then processed and presented to the user.

View

The View component handles the user interface. The user is presented with web pages designed using Java Server Pages (JSP) technology. Java Server Faces (JSF) handles the navigation between screens and is responsible to interact with the controller to handles user requests.

In this web application each functionality is handled by respective services. For Example Book search functionality is handled by Book Search Service module.

Controller

The Controller component is responsible to interpret data from the user and speak with the underlying data access layer to perform actions fetch the data from the database. It handles the feature logic for each service.

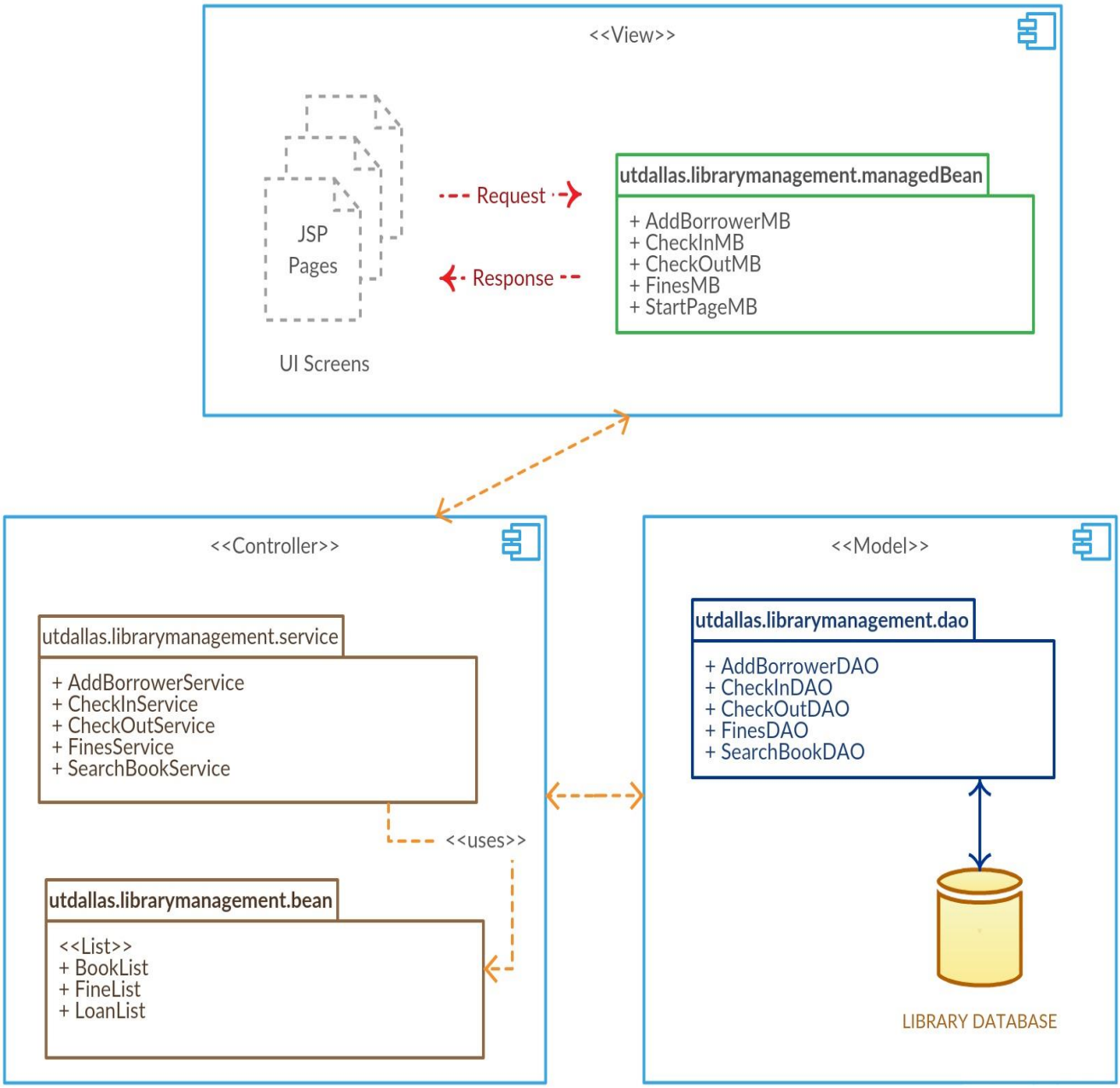

Figure 3 Class Diagram

Assumptions:

Book Search:

1. The Librarian is to enter only ISBN-10 character code in the book search field. When the librarian enters ISBN-13 character code the system would respond with an error message.
2. For books without authors, librarian should enter the ISBN number to search for books. The system won't dynamically search for books without author's name.
3. The librarian is aware that author or publisher name will be displayed in the same column. It is responsibility of the librarian to distinguish between author and a publisher.

Checkout:

1. When the borrower doesn't have any fine dues, the system will allow the librarian to check out the book. It won’t throw an information message stating that “Borrower doesn't have fines”
2. The Library administrator knows the book that was already checked out by the borrower. If the librarian checks out already checked out book, the system won't throw an error message. It continues to allow the librarian to check out books until there are copies available in the branch id entered.