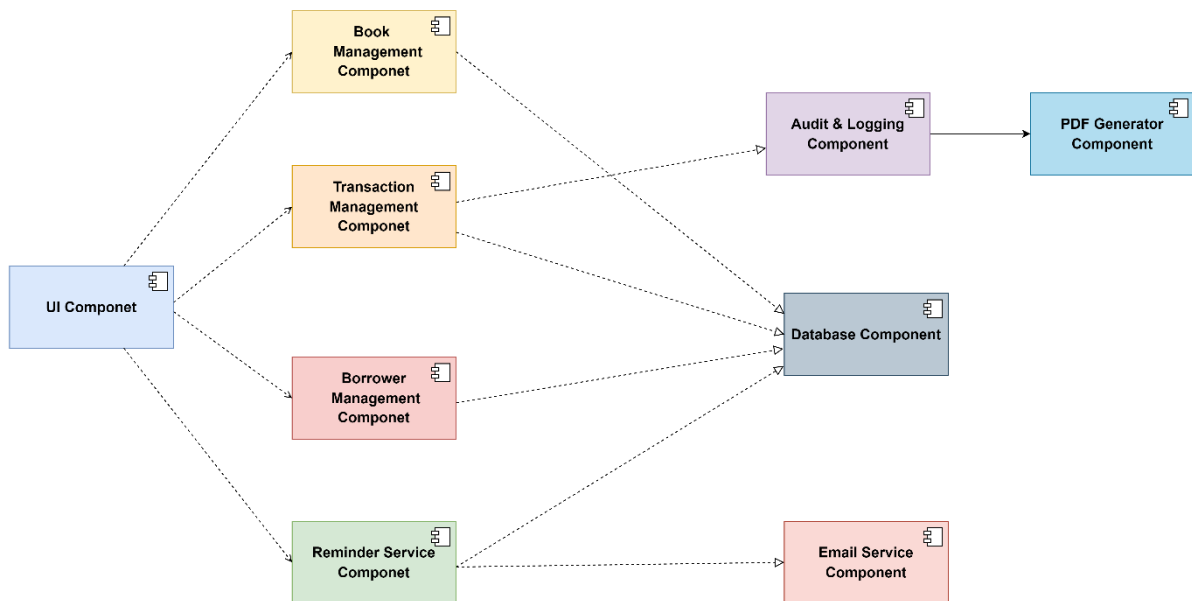


Component Diagram



1. User Interface (UI) Component

- **Description:** Handles all interactions with the users (Librarian and Borrower). It includes web pages or forms for logging in, searching books, issuing/returning books, and managing borrowers.
- **Interfaces:**
 - Search Interface
 - Book Issue/Return Interface
 - Borrower Management Interface
 - Login Interface

2. Book Management Component

- **Description:** Manages all operations related to book data including adding, updating, and deleting books from the library's catalog.
- **Interfaces:**
 - Book CRUD Interface (Create, Read, Update, Delete)
 - Book Search Interface

3. Borrower Management Component

- **Description:** Handles all borrower-related operations, including registration, updating borrower information, and managing their accounts.
- **Interfaces:**
 - Borrower CRUD Interface
 - Account Management Interface

4. Transaction Management Component

- **Description:** Manages all borrowing and returning transactions, keeping track of book statuses, borrower histories, and any associated fines.

- **Interfaces:**
 - Transaction Logging Interface
 - Fine Calculation Interface
- 5. **Reminder Service Component**
 - **Description:** Provides automated reminder functionalities, such as notifying borrowers about due dates, overdue books, etc.
 - **Interfaces:**
 - Reminder Notification Interface
 - Reminder Scheduling Interface
- 6. **Audit and Logging Component**
 - **Description:** Supports audit operations, generating reports, and maintaining logs for system activities and transactions.
 - **Interfaces:**
 - Audit Report Interface
 - Log Management Interface
- 7. **Email Service Component**
 - **Description:** Sends emails for various purposes such as reminders, notifications, and confirmations related to transactions and borrower management.
 - **Interfaces:**
 - Email Sending Interface
- 8. **PDF Generator Component**
 - **Description:** Generates PDF documents, such as receipts or reports, based on transactions and audits.
 - **Interfaces:**
 - PDF Creation Interface
- 9. **Database Component**
 - **Description:** Central storage that maintains all data, including books, borrowers, transactions, and logs.
 - **Interfaces:**
 - Data Access Interface
 - Query Execution Interface

Connections:

- The **UI Component** communicates with the **Book Management**, **Borrower Management**, **Transaction Management**, and **Reminder Service** components to perform user operations.
- The **Book Management** and **Borrower Management** components interact with the **Database Component** to persist and retrieve data.
- The **Transaction Management Component** uses the **Audit and Logging Component** to log all transactions and generate audit reports.
- The **Reminder Service Component** interacts with the **Email Service Component** to send out reminders to borrowers.
- The **PDF Generator Component** interacts with the **Transaction Management** and **Audit and Logging Components** to generate necessary documents.
- All components that require data access or storage interact with the **Database Component**.