

# Document: Changes Made to the Initial ERD to the Final ERD (P3 - Logical ERD Model)

## 1. Addition of a New Entity

- Entity Added: **MEMBERSHIP** (Associative)
  - Attributes:
    - **member\_library\_id** (Primary Key)
    - **library\_id** (Foreign Key)
    - **member\_id** (Foreign Key)
    - **registration\_date**
    - **membership\_status**
  - Relationships:
    - Connected to **MEMBER** and **LIBRARY**.
    - Mandatory Many to Mandatory One

## 2. Changes in Relationships

- The relationship between **MEMBER** and **LIBRARY** has been modified:
  - In the initial ERD, a direct relationship existed between **MEMBER** and **LIBRARY**.
  - In the final ERD, this relationship is now mediated through the new **MEMBERSHIP** associative entity.
  - Mandatory Many to Mandatory One

### 3. Attribute Adjustments

- **MEMBER** Entity:
  - The attribute `status` has been removed in the final ERD.
- **TRANSACTION** Entity:
  - Updated status attribute to `payment_status` attribute.

### 4. New Attributes for Library Entity

- **Library** Entity:
  - The attributes that were newly added are `phone`, `email` and `working_hours`.

### 5. No Changes in Other Entities

- Entities such as `BOOK`, `AUTHOR`, `PUBLISHER`, `GENRE`, `BOOK_AUTHOR`, and their relationships remain unchanged between the two versions.

## Assumptions for the Library Database System

### 1. Book Copy Identification

Each book copy is assigned a unique `copy_id`, enabling precise tracking of individual copies across the library system. This identifier allows for efficient management of multiple copies of the same book, each distinguished by its unique `copy_id`.

## **2. Multi-Faceted Fine System**

The system accommodates a nuanced approach to fines, allowing for multiple types of fines to be associated with a single book. This includes, but is not limited to:

- Late return fines
- Damage-related charges
- Fees for lost books

This comprehensive fine structure ensures proper accountability and maintenance of the library's collection.

## **3. Book Reservation Feature**

The library system incorporates a pre-reservation functionality, allowing users to reserve books in advance. This feature enhances user experience by ensuring access to high-demand resources and efficient resource allocation.

## **4. Entity-Specific Status Attributes**

When a status attribute is present for a particular entity, it is tailored specifically to that entity or table. This approach ensures that status information is contextually relevant and meaningful within each domain of the library system.

## **5. Mandatory Library Presence**

Every campus within the institution is required to have at least one library. This assumption underscores the importance of library facilities in supporting academic activities and ensures equitable access to resources across all campus locations. These refined assumptions provide a clearer framework for understanding the library database system's design and functionality, reflecting a well-thought-out approach to managing library resources and user interactions.

## Summary

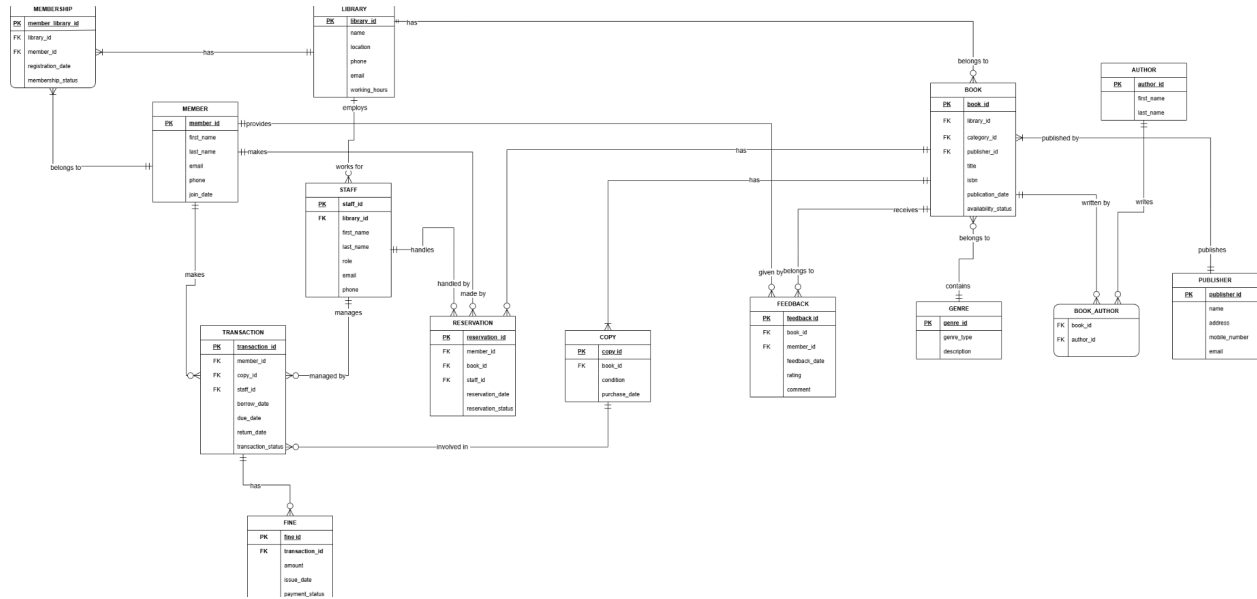
The main changes include:

1. The addition of a new associative entity, **MEMBERSHIP**, to mediate relationships between members and libraries.
2. Removal of the **status** attribute from the **MEMBER** entity.
3. Updation of the **payment\_status** attribute in the **TRANSACTION** entity.

These adjustments serve to enhance the normalization of the database structure and better represent membership-specific data. The changes reflect a more sophisticated understanding of the relationships between entities in the library system, particularly in how members interact with libraries. The introduction of the **MEMBERSHIP** entity for more detailed tracking of membership information, beneficial for library management and reporting purposes.

The consistency in other entities suggests that the initial design was robust in those areas, requiring no further modifications. Overall, these changes contribute to a more refined and accurate representation of the library system's data structure.

## P3 - Logical ERD Model



Link ~ <https://rb.gy/4sgrv7>

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