

B.1 OVERVIEW

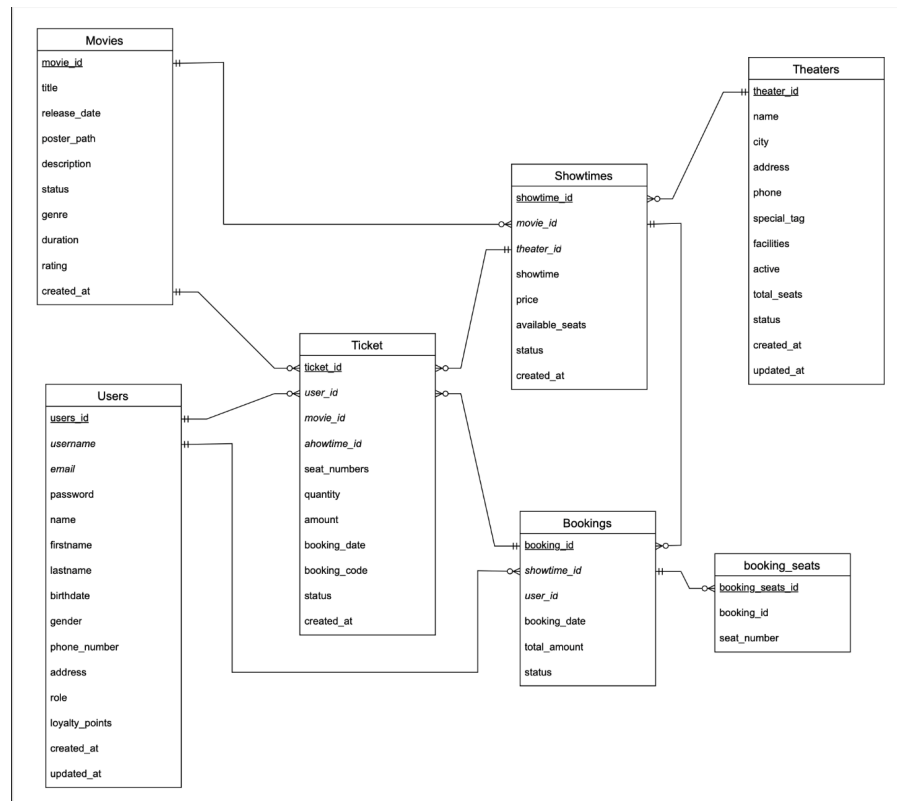
The project aims to create a Cineplex 21 like online movie theater platform with essential features for movie browsing and ticket booking. Users can view current movies, book tickets, and manage their accounts. The system provides functionalities for both regular users and administrators, where users can search movies, view showtimes, reserve seats, make payments, and receive e-tickets, while administrators can manage movies, schedules, theaters, and view sales reports.

B.2 REVISED BUSINESS RULES AND ASSUMPTIONS

1. The user should be able to create an account with the correct email address, username, name, and password. On the creation of every user account, a unique identifier will be automatically generated.
2. Users must register with personal information including username, email, password, first name, last name, birthdate, gender, phone number, and address. Email and username must be unique within the system.
3. The system supports two types of user roles: regular users and administrators, determined by the "role" attribute in the Users entity.
4. Regular users can view movies, search for movies, view movie details, view showtimes, reserve tickets, make payments, receive e-tickets, view order history, and modify their profile information.
5. Administrators can manage movies (add, edit, delete), manage schedules, manage theaters, view sales reports, and manage user accounts if necessary.
6. A movie entry must include a title, release date, and basic description. Additionally, it may include genre, poster path, duration, rating, and status.
7. Each movie can have multiple showtimes across different theaters, and each showtime is for a specific movie in a specific theater.
8. Theaters have attributes such as name, city, address, phone number, special tags, facilities, and total number of seats available.
9. For each showtime, the system maintains information about available seats, price, and status.
10. When booking a ticket, the user selects a specific showtime, seats, and quantity. The system generates a unique booking code.
11. A booking can include multiple seats, and each seat is uniquely identified within a booking by its seat number.
12. The system tracks the status of bookings (e.g., pending, confirmed, canceled) and tickets (e.g., active, used, expired).
13. Users accumulate loyalty points based on their booking activities.
14. The system must record all ticket booking transactions for reporting and audit purposes, including timestamps for creation and updates.
15. The system must handle booking cancellations according to predefined policies.

16. The system must notify users of their booking and payment status.
17. All financial transactions must be recorded with appropriate details including the total amount paid.

B.3 ERD (CONCEPTUAL DATA MODELING)



The Entity Relationship Diagram for the movie ticket booking system consists of the following main entities:

1. **Users** - Stores user account information
2. **Movies** - Contains movie details
3. **Theaters** - Stores information about movie theaters
4. **Showtimes** - Links movies with theaters at specific times
5. **Bookings** - Records ticket reservations
6. **Tickets** - Contains specific ticket information
7. **Booking_Seats** - Maps booked seats to bookings

Key relationships between entities include:

- Users make Bookings (one-to-many)
- Users have Tickets (one-to-many)
- Movies have Showtimes (one-to-many)
- Theaters have Showtimes (one-to-many)
- Showtimes have Bookings (one-to-many)

- Bookings have Tickets (one-to-many)
- Bookings have Booking_Seats (one-to-many)

B.4 JUSTIFICATIONS OF ERD BASED ON BUSINESS RULES & ASSUMPTIONS

BUSINESS RULES RELATED TO ENTITY USERS

BR1: The user should be able to create an account with the correct email address, username, name, and password. On the creation of every user account, a unique identifier will be automatically generated.

- The attributes username, email, password, and name in the Users entity fulfill this requirement.
- The users_id attribute serves as the unique identifier automatically generated for each user.

BR2: Users must register with personal information including username, email, password, first name, last name, birthdate, gender, phone number, and address.

- The Users entity contains all these attributes: username, email, password, firstname, lastname, birthdate, gender, phone_number, and address.

BR3: The system supports two types of user roles: regular users and administrators.

- The role attribute in the Users entity distinguishes between regular users and administrators.

BR13: Users accumulate loyalty points based on their booking activities.

- The loyalty_points attribute in the Users entity tracks this information.

BR14: The system must record all transactions with timestamps.

- The created_at and updated_at attributes in the Users entity track when user accounts are created and modified.

The PK of the Users entity is: users_id

BUSINESS RULES RELATED TO ENTITY MOVIES

BR6: A movie entry must include a title, release date, and basic description.

- The Movies entity includes title, release_date, and description attributes.

- Additional attributes like poster_path, genre, duration, rating, and status provide more comprehensive movie information.

BR14: The system must record all transactions with timestamps.

- The created_at attribute in the Movies entity tracks when movie records are created.

The PK of the Movies entity is: movie_id

BUSINESS RULES RELATED TO ENTITY THEATERS

BR8: Theaters have attributes such as name, city, address, phone number, special tags, facilities, and total number of seats available.

- The Theaters entity includes all these attributes: name, city, address, phone, special_tag, facilities, and total_seats.
- The status attribute tracks whether a theater is currently active/operating.

BR14: The system must record all transactions with timestamps.

- The created_at and updated_at attributes in the Theaters entity track when theater records are created and modified.

The PK of the Theaters entity is: theater_id

BUSINESS RULES RELATED TO ENTITY SHOWTIMES

BR7: Each movie can have multiple showtimes across different theaters, and each showtime is for a specific movie in a specific theater.

- The Showtimes entity includes movie_id and theater_id as foreign keys to establish these relationships.
- The showtime attribute specifies the date and time of the screening.

BR9: For each showtime, the system maintains information about available seats, price, and status.

- The Showtimes entity includes available_seats, price, and status attributes.

BR14: The system must record all transactions with timestamps.

- The created_at attribute in the Showtimes entity tracks when showtime records are created.

The PK of the Showtimes entity is: showtime_id

BUSINESS RULES RELATED TO ENTITY BOOKINGS

BR11: A booking can include multiple seats, and each seat is uniquely identified within a booking by its seat number.

- The Bookings entity is related to the Booking_Seats entity to track which seats are reserved in each booking.

BR12: The system tracks the status of bookings.

- The status attribute in the Bookings entity tracks the current status of each booking.

BR17: All financial transactions must be recorded with appropriate details.

- The total_amount attribute in the Bookings entity tracks the financial value of each booking.

BR14: The system must record all transactions with timestamps.

- The booking_date attribute in the Bookings entity serves as a timestamp for when the booking was made.

The PK of the Bookings entity is: booking_id

BUSINESS RULES RELATED TO ENTITY TICKETS

BR10: When booking a ticket, the user selects a specific showtime, seats, and quantity. The system generates a unique booking code.

- The Ticket entity includes showtime_id, seat_numbers, quantity, and booking_code attributes.

BR12: The system tracks the status of tickets.

- The status attribute in the Ticket entity tracks the current status of each ticket.

BR14: The system must record all transactions with timestamps.

- The created_at and booking_date attributes in the Ticket entity track when the ticket was created and booked.

The PK of the Ticket entity is: ticket_id

BUSINESS RULES RELATED TO ENTITY BOOKING_SEATS

BR11: A booking can include multiple seats, and each seat is uniquely identified within a booking by its seat number.

- The Booking_Seats entity links bookings to specific seat numbers through the booking_id and seat_number attributes.

The PK of the Booking_Seats entity is: booking_seats_id

BUSINESS RULES RELATED TO THE RELATION BETWEEN USERS AND BOOKINGS

BR4: Regular users can reserve tickets and make payments.

- The relationship between Users and Bookings (via user_id in the Bookings entity) facilitates this functionality.
- One user can make multiple bookings (one-to-many relationship).

BUSINESS RULES RELATED TO THE RELATION BETWEEN USERS AND TICKETS

BR4: Regular users can receive e-tickets.

- The relationship between Users and Tickets (via user_id in the Ticket entity) fulfills this requirement.
- One user can have multiple tickets (one-to-many relationship).

BUSINESS RULES RELATED TO THE RELATION BETWEEN MOVIES AND SHOWTIMES

BR7: Each movie can have multiple showtimes across different theaters.

- The relationship between Movies and Showtimes (via movie_id in the Showtimes entity) establishes this connection.
- One movie can have multiple showtimes (one-to-many relationship).

BUSINESS RULES RELATED TO THE RELATION BETWEEN THEATERS AND SHOWTIMES

BR7: Each showtime is for a specific movie in a specific theater.

- The relationship between Theaters and Showtimes (via theater_id in the Showtimes entity) establishes this connection.
- One theater can have multiple showtimes (one-to-many relationship).

BUSINESS RULES RELATED TO THE RELATION BETWEEN SHOWTIMES AND BOOKINGS

BR10: When booking a ticket, the user selects a specific showtime.

- The relationship between Showtimes and Bookings (via showtime_id in the Bookings entity) facilitates this functionality.
- One showtime can have multiple bookings (one-to-many relationship).

BUSINESS RULES RELATED TO THE RELATION BETWEEN BOOKINGS AND BOOKING_SEATS

BR11: A booking can include multiple seats.

- The relationship between Bookings and Booking_Seats (via booking_id in the Booking_Seats entity) establishes this connection.
- One booking can reserve multiple seats (one-to-many relationship).

BUSINESS RULES RELATED TO THE RELATION BETWEEN SHOWTIMES AND TICKETS

BR10: When booking a ticket, the user selects a specific showtime.

- The relationship between Showtimes and Tickets (via showtime_id in the Ticket entity) facilitates this functionality.
- One showtime can have multiple tickets (one-to-many relationship).

BUSINESS RULES RELATED TO THE RELATION BETWEEN MOVIES AND TICKETS

BR4: Regular users can view movie details and book tickets for specific movies.

- The relationship between Movies and Tickets (via movie_id in the Ticket entity) establishes this connection.
- One movie can have multiple tickets issued for it (one-to-many relationship).

This comprehensive conceptual data model ensures that all business requirements for the movie ticket booking system are satisfied by the proposed database structure.