UNIVERSITI TEKNOLOGI MALAYSIA

FACULTY OF COMPUTING, UTMJB

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GROUP PROJECT

DATABASE

Phase 2 (P2) – Database Conceptual Design (ERD) (5%)

SECD 2523 : DATABASE

SECTION 03

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1.0 Introduction

In the dynamic landscape of the entertainment industry, the way audiences experience movies are undergoing a paradigm shift. As technology continues to shape consumer expectations, the need for a seamless and quality platform for cinema bookings has become increasingly evident. This proposal outlines a strategic initiative to introduce an Online Cinema Booking System, aimed at not only simplifying the ticketing process but also enhancing the overall system for our patrons. DFD, Data & Transaction Requirement, Database Conceptual Design, Conceptual ERD and Enhanced ERD will be included and will be explained in this Phase 2 proposal. The details will be useful to support our team's upcoming proposal and create a good opportunity to define more ideas to develop the database for the Online Cinema Booking System.

2.0 DFD (TO-BE)

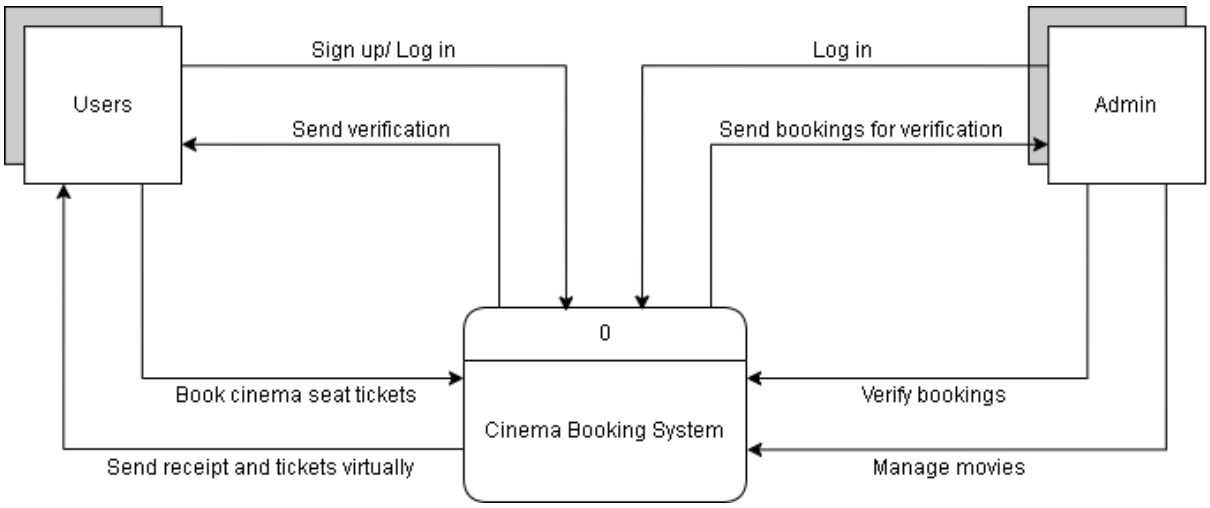

Figure 1: Context Diagram for Cinema Booking System

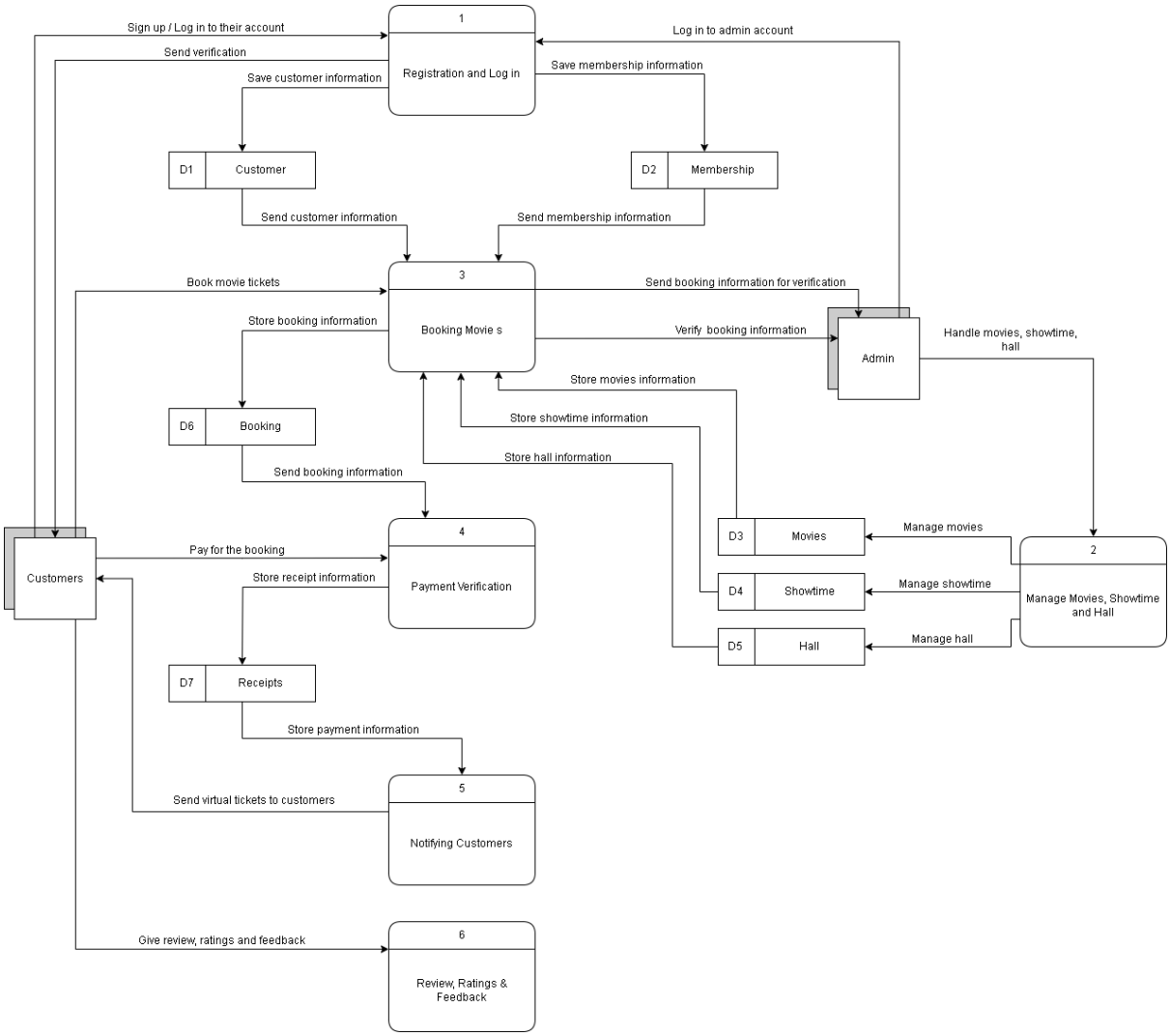

Figure 1: DFD for Cinema Booking System

3.0 Data & Transaction Requirement

In a database, data requirement is specifying what information is needed regarding library for example, title of books, author's name and details involving borrowers. Nonetheless, transaction requirement consists of mentioning what types of functions to be performed on that information such as adding new books, updating borrowers' record or deletion of returned books. In essence, the data requirements indicate as to which information should be put in the database while the transaction requirements involve various activities performed on a defined information making the base on which efficient data administration and application are based.

3.1 Proposed Business Rule

1. **Customer** - Each customer must have a unique CustomerID. Each customer can have one membership, linked through the MembershipID. Only one receipt received by each customer.

2. **Membership -** Each membership is associated with a unique MembershipID. Each membership can have many customers.

3. **Receipts –** Each receipts information entry has a unique ReceiptsID. Payment information is linked to a specific customer through CustomerID.

4. **Movie -** Each movie has a unique MovieID. One movie can have many showtime. A movie can be played in many halls.

5. **Showtime -** Each showtime has a unique ShowtimeNo. Many showtime can have many movies.

6. **Booking -** Each booking has a unique BookingID. Each booking can be made by one customer. Each booking can check many showtime.

7. **Hall -** Each hall has a unique HallNumber. A hall may be played by one movie.

3.2 Proposed Data & Transactional

1. **Customer**:
   - **Data Entry**:
   – Add a new customer with a unique CustomerID.
   – Link a customer to a membership using MembershipID.
   – Associate receipts information through ReceiptsID.
   - **Data Update/Deletion**:
   – Update customer information.
   – Delete a customer.
   - **Data Queries**:
   – Retrieve customer details by CustomerID.
   – Retrieve all customers with active memberships.
   – Get receipts information for a specific customer.

2. **Membership**:
   - **Data Entry**:
   – Create a new membership with a unique MembershipID.
   – Link membership to a specific customer using CustomerID.
   - **Data Update/Deletion**:
   – Update membership details.
   – Delete a membership.
   - Data Queries:
   – Retrieve membership details by MembershipID.
   – Get all customers with their associated memberships.
   – Query members with a certain number of accumulated points.

3. **Receipts**:
    - **Data Entry**:
    - Record receipts information with a unique ReceiptID.
    - Associate receipt information with a specific customer using CustomerID.
    - **Data Update/Deletion**:
    - Update receipt details.
    - Delete a receipt entry.
    - **Data Queries**:
    - Retrieve receipt information by ReceiptID.
    - Get all receipts associated with a specific customer.

4. **Movie**:
    - **Data Entry**:
    - Add a new movie with a unique MovieID.
    - Specify details like title, genre, language, release date, duration and HallNumber.
    - **Data Update/Deletion**:
    - Update movie details.
    - Delete a movie.
    - **Data Queries**:
    - Retrieve movie details by MovieID.
    - Get a list of all movies in a specific genre.

5. **Showtime**:
    - **Data Entry**:
    - Schedule a new showtime with a unique ShowtimeNo
    - Link the showtime to a specific movie using MovieID.
    - **Data Update/Deletion**:
    - Update showtime details.
    - Delete a showtime.
    - **Data Queries**:
    - Retrieve showtime details by ShowtimeNo.
    - Get all showtimes for a specific movie.

6. **Booking**:
    - **Data Entry**:
    - Make a new booking with a unique BookingID.
    - Link the booking to a specific customer through CustomerID and a showtime through ShowtimeNo.
    - **Data Update/Deletion**:
    - Update booking status.
    - Cancel a booking.
    - **Data Queries**:
    - Retrieve booking details by BookingID.
    - Get all bookings for a specific customer.

7. **Hall**:
    - **Data Entry**:
    - A movie can be played at a hall with unique HallNumber.
    - Link the hall to a specific Movie through MovieID
    - **Data Update/Deletion**:
    - Update available hall.
    - Delete hall.
    - **Data Queries**:
    - Retrieve hall details by HallNumber.
    - Get all hall for a specific movie.

4.0 Database Conceptual Design

The process of creating a high-level representation of a database's structure and organization is known as database conceptual design. It entails identifying the essential entities, relationships, and constraints that are going to be included in the database without getting into technical or implementation nuances. Constructing an understandable and abstract model of the data and its relationships based on the system requirements is the aim of conceptual design. In this topic, we will present the Entity Relationship Diagram (ERD) and Enhance Entity Relationship Diagram (EERD) using conceptual design.

4.1 Conceptual ERD

Entity-Relationship (ER) modeling is a popular and widely used technique in the field of database design. In this project, we have identified 7 entities that are necessary in developing an Online Cinema Booking System. The entity has its own relationship and multiplicity as shown in the ERD below.

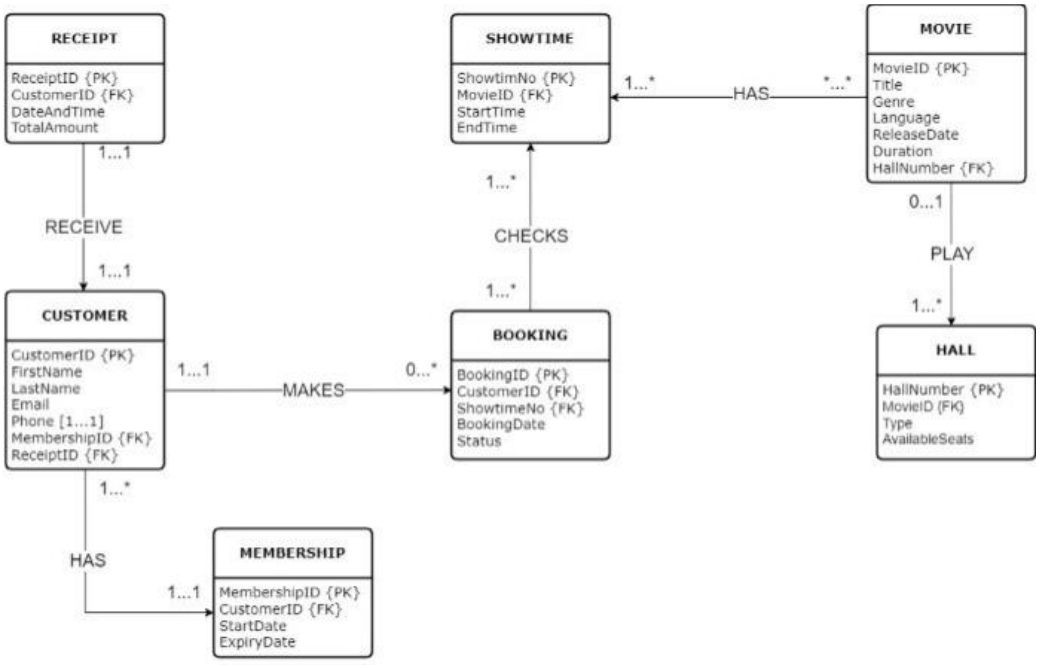

Figure 3: ERD for Cinema Booking System

4.2 Enhanced ERD (EERD)

An Enhanced Entity-Relationship Diagram (EERD) is like a more advanced version of a regular diagram used for designing databases. It includes extra features that help show more complicated connections and rules between pieces of information. In the provided ERD, there are two subclasses under the entities Membership and Hall. Additionally, there is a weak entity that exists in the relationship between Customer and Receipt.

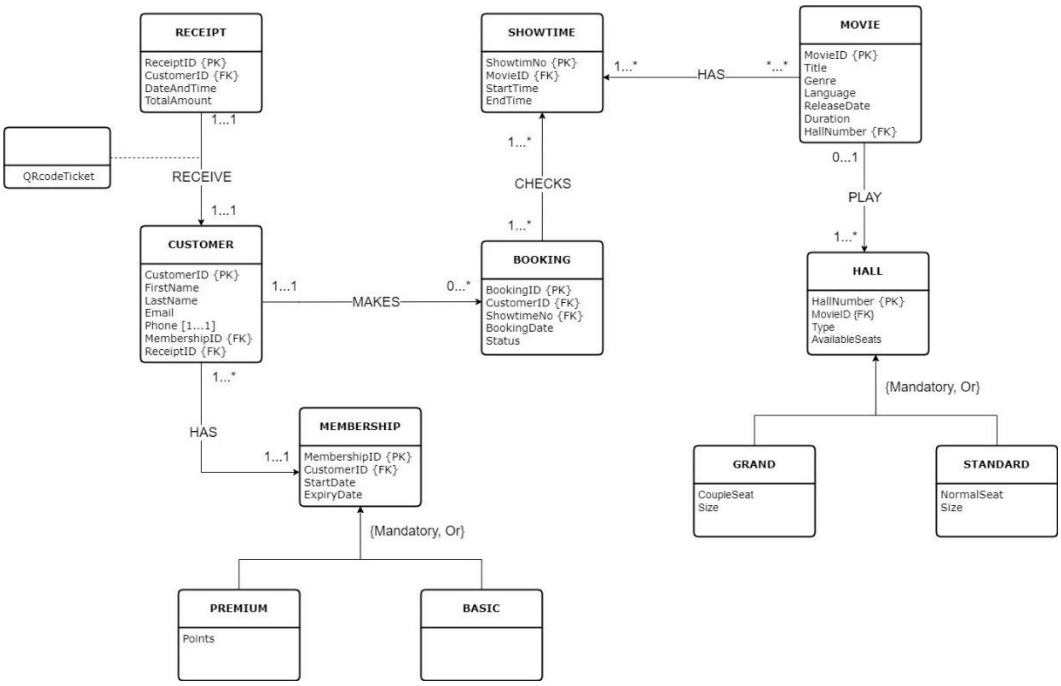

Figure 4: EERD for Cinema Booking System

5.0 Data Dictionary

Customer

Field Name	Data Type	Field Length	Constraint	Description	Example
CustomerId	Int	10	Primary Key	Customer id or unique key that auto generated	1234
MembershipId	Int	10	Foreign Key	Customer membership id or unique key that auto generated	0001
ReceiptID	Varchar	30	Foreign Key	Customer receipt id	A01MY220
Firstname	Varchar	30	Not Null	First name of customer	Abu
Lastname	Varchar	30	Not Null	Last name of customer	Hakiem
PhoneNo	Int	15	Not Null	Landline or phone number	01234567
Email	Varchar	30	Not Null	Email id for customer	Abu12@yahoo.com

Receipt

Field Name	Data Type	Field Length	Constraint	Description	Example
ReceiptID	Varchar	30	Primary Key	Customer receipt id	A01MY220
CustomerId	Int	10	Foreign Key	Customer id or unique key that auto generated	1234
DateAndTime	TIMESTAMP	-	Not Null	Date and time for receipt	2008-11-11 13:23:44
TotalAmount	Int	10	Not Null	Total amount of payment	90

Membership

Field Name	Data Type	Field Length	Constraint	Description	Example
MembershipId	Int	10	Primary Key	Customer membership id or unique key that auto generated	0001
CustomerId	Int	10	Foreign Key	Customer id or unique key that auto generated	1234
StartDate	DATE	-	Not Null	Start date for the membership	2008-11-11
ExpiryDate	DATE	-	Not Null	Expiry date for the membership	2008-12-11

Booking

Field Name	Data Type	Field Length	Constraint	Description	Example
BookingID	Int	10	Primary Key	Customer booking id	0091
CustomerId	Int	10	Foreign Key	Customer id or unique key that auto generated	1234
ShowtimeNo	Int	10	Foreign Key	Show time number for movie	11
Status	Varchar	20	Not Null	Status booking for customer	In Process

ShowTime

Field Name	Data Type	Field Length	Constraint	Description	Example
CustomerId	Int	10	Primary Key	Show time number for movie	11
MovieID	Int	10	Foreign Key	Movie id or unique key that auto generated	002
StartTime	TIMESTAMP	-	Not Null	Show start time	2008-11-11 13:23:44
EndTime	TIMESTAMP	-	Not Null	Show end time	2008-11-11 13:23:44

Movie

Field Name	Data Type	Field Length	Constraint	Description	Example
MovieID	Int	10	Primary Key	Movie id or unique key that auto generated	002
Title	Varchar	30	Not Null	Movie title	Upin & Ipin Kembara
Genre	Varchar	15	Not Null	Movie genre	Horror
Language	Varchar	15	Not Null	Movie language	English
ReleaseDate	DATE	-	Not Null	Release date for movie	2008-12-11
Duration	Varchar	20	Not Null	Duration for movie	1 Hour 45 Minutes
HallNumber	Int	10	Foreign Key	Movie hall number	0101

Hall

Field Name	Data Type	Field Length	Constraint	Description	Example
HallNumber	Int	10	Primary Key	Movie hall number	0101
MovieID	Int	10	Foreign Key	Movie id or unique key that auto generated	002
Type	VarChar	15	Not Null	Seat type for customer	Standard
AvailableSeats	Int	10	Not Null	Available seats for the movie	5

6.0 Summary

In summary, The Cinema Booking System project for phase 2 focuses to enhance operational efficiency by streamlining the booking process, integrating a real-time database, ensuring secure transactions process, and providing the specific flow for booking the tickets. With a focus on user satisfaction, the system will feature an intuitive interface and regular staff training programs. Key priorities involve scalability for accommodating growth and continuous improvement based on user feedback. Additionally, a fundamental commitment to strict adherence to data protection regulations will be maintained. Furthermore, all the entities of the project will be useful to create a reliable database and make our system perfect to use in the future. A data dictionary also can be huge help to catalog and communicate the structure and content of data, and provides meaningful descriptions for individually named data objects for our database system cinema booking system.