



International University, HCMC National University
School of Computer Science and Engineering

PROJECT FINAL REPORT

Topic: Cinema booking system Project

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Chapter I: INTRODUCTION

1. Introduction

These days, millions of people enjoy watching movies. Most people of all ages enjoy watching stories that are told through amazing sound and visuals. When watching a movie in a theater, viewers can follow the plot from start to finish, empathize with the characters, and remember most of the details. However, hours spent in line while trying to buy tickets and a lack of knowledge about customer movie preferences could lower the quality of the experience.

Thanks to the development of technology, everyone tends to do everything online like booking food, booking restaurant seats, and even booking movie tickets online. Therefore, a cinema booking system is necessary now, which enables users to browse the web and buy movie tickets more easily and faster.

2. Abstract

2.1. Project Background

Nowadays, every app or website for cinema booking is too slow and is not updated which makes it difficult for people who want to book cinema tickets online and must go to the cinema to buy movie tickets. That is the reason why we want to build a modern cinema booking system to help people easily buy movie tickets online.

Anyone with an Internet connection can use the Cinema Booking System from anywhere, at any time^[1]. Customers can use this method to buy movie tickets directly from the Internet and pay with their bank accounts. The customers' information will then be added to the database for the cinema for analysis and management. This Project not only ends the long queue of customers in the cinema, but also improves the ticket sales.

2.2. Project Objectives

- **User Interface:** build a user interface for users to easily select movies, view showtimes, book cinema tickets, and select seats seamlessly.
- **Managers Interface:** develop an admin dashboard for the cinema manager to easily track the number of customers, money, movies, and seats available. Admins can change the content based on the data in the database, as well as monitor the system's statistics.
- **Cinema Payment Gateway:** provide the cinema with an online payment gateway that allows customers to pay for their tickets online via internet banking, credit card,
- **Reporting System:** build an emergency reporting system so that the user can inform technical staff or people in charge to fix or maintain the system as soon as possible.

There are also some of the project's other goals:

- Including a summary of the film's plot and its genre on the website.
- Managing and analyzing customer preferences based on earlier choices.
- Making 24/7 customer support.

3. Project Proposal

3.1. Problem Statement

One of the best forms of entertainment after a busy day is going to the movies with family and friends. However, this excitement quickly fades after waiting for hours in a line to book tickets.

The first challenge is creating a clean and beautiful user interface that can be easily accessed and used by customers. The second problem is creating a database to store the information of the customers when they sign into the account to book the ticket online.

3.2. Goals

The purpose of this project is to build a website for users to browse movie listings, book cinema tickets, and select seats online. Not only for users of this project, but it also provides cinema managers with a managed website that can help them manage their screenings, occupancy, and revenue.

3.3. Methodology

Our team will choose the Agile process to apply in our process. Because the brief time constraints motivate increased productivity and effectiveness. And there is much flexibility to change project direction and experiment with new directions. These are the main roles we have in our project:

- Create a database that stores the information of the customers (when customers sign up) and a database to store the information of the movies to the latest, as well as their schedule.
- Build up the User Interface for the website so that the customer can adjust the information of their account and book the ticket.
- The database can automatically update its information when the customers adjust their information or sign in/up for the account for the cinema website. The movie which has just been released can also be updated in the database by the admin.

Chapter II: MATERIALS AND METHODS

4. Project Approach

The project approach defines the project methodology, tools, and shows how the project is planned, implemented

4.1. Features[2]

Following are the features of our Cinema Booking Management System^{[2][4]}:

- **Login Function:** Provide customers with an interface to log in to their account, which can record the history of purchased movie tickets or accumulate points for many promotions. If the customers do not have an account, they can sign into the new account. In the interface, there will be a “Forgot Password” link so that customers can recover their password if they forget it.
- **Buy ticket function:** Provide users an interface that helps them to see all the available on-screen movies or in coming movies so that they can choose their favorite films. Then they can choose a suitable time to watch it and finally pay for their tickets.
- **Movie recommended function:** The system offers the customer comprehensive information on the available movie with its schedule, rating, trailer as well as summary of the plot so that he/she can easily purchase their favorite films. Moreover, the application can also notify the app users with new films or suggest movies based on customers' previous choices.
- **Seat selection function:** After selecting for the movie, the system will show on the screen the seating chart to see which seat is available, or unavailable. Then the system will move

to the food (popcorn and beverage) selection part. Finish all the steps, the customer will move to the Payment part.

- **Payment function:** This function can help cinemas apply many payment methods to their payment gate such as cash, online payment (Momo, internet banking) or debit, credit card which will help customers easily pay for their tickets.
- **Manager function:** Admins can utilize the Cinema Booking Management System to add, delete, and alter data such as movie descriptions and timetables, which will update the relevant application that is accessible to customers. Admins can change the content based on the data in the database, as well as monitor the system's statistics.
- **Report function:** Build an emergency reporting system so that the customers can inform customer service and they will report it to the maintenance engineer to fix the problems.

4.2. System's Workflow

- When the customers get access to the booking website, they have to log in to their account to book the ticket. If they don't have an account, they can click on the sign-in button to create a new one. To create an account, some general customer information is required. All the information about the customers will be stored safely in the database. There will also be a "Forgot password" section so that customers can log in to the account if they lose it.
- After finishing logging in, the customers will see a list of upcoming movies and available movies in the theater. The customers can click on the movie that they are interested in, read the description and genre of each movie, and choose the suitable time and seats if they want to buy the tickets. They can choose many different seats at the same time. Then, the customers can make the payment for the ticket in the transaction section. Many payment methods will be provided for the customers. The customers can report any problems through the "report" button, and the problems will be reported directly to the manager of cinema.

4.3. Development Tools

- Web design: **Figma** - A website for developers, which can design UI for the project
- Code editor: **Visual Studio Code** - A source code editor developed by Microsoft
- Programming Language:
 - o **HTML:** the most basic building block of the Web. It defines the meaning and structure of web content.
 - o **CSS:** a style sheet language used for describing the presentation of a document. CSS describes how elements should be given on screen, on paper, in speech, or on other media.
 - o **PHP:** a server-side scripting language commonly used for web development. It's a popular choice for building web applications, including booking systems.
- Database Management:
 - o **MySQL:** A popular open-source relational database management system.
- Database design: we use **Lucidchart**, **draw.io** to draw the Entity-Relationship Diagrams (ERD) for our database and design the system's structure.
- Payment Gateway (**Momo**): Integrate a payment gateway for handling ticket payments securely.

- **Git, Github:** Utilize version control for tracking changes and collaborating with a development team.

4.4. Project Timeline

Since our team chose the Agile process to apply in our process. Therefore, we divided our tasks into Sprint, and each task in the Sprint will be assigned to the suitable member.

Table 1. Sprint 1 Timeline

Sprint 1 - System login (13/10/2023 – 3/11/2023)						
Tasks	Responsibilities	Monday	Tuesday	Wednesday	Thursday	Friday
Design and Draw ER Diagram	Toan	2 hours	2 hours	2 hours	2 hours	2 hours
Design Interface	Nguyen, Khanh, Binh	3 hours	3 hours	3 hours	3 hours	3 hours
Write Midterm Report (Milestone 2)	All Team	3 hours	3 hours	3 hours	3 hours	3 hours
Define and Draw the Use Case Diagram and Class Diagram	All Team	4 hours	4 hours	4 hours	4 hours	4 hours
Design Login Interface	Khanh, Binh	3 hours	3 hours	3 hours	3 hours	3 hours
Design Login Function	Khanh, Binh	3 hours	3 hours	3 hours	3 hours	3 hours
Creating IU for the website	Toan, Nguyen	4 hours	4 hours	4 hours	4 hours	4 hours

Table 2. Sprint 2 Timeline

Sprint 2 - Account Database (27/10/2023 – 6/11/2023)						
Tasks	Responsibilities	Monday	Tuesday	Wednesday	Thursday	Friday
Create database	All Team	3 hours	3 hours	3 hours	3 hours	3 hours
Create database for saving account	Khanh, Binh	4 hours	4 hours	4 hours	4 hours	4 hours

Table 3. Sprint 3 Timeline

Sprint 3 - Booking System (3/11/2023 – 17/11/2023)						
Tasks	Responsibilities	Monday	Tuesday	Wednesday	Thursday	Friday
Define requirements for the main function	All Team	4 hours	4 hours	4 hours	4 hours	4 hours
Design and Create Class Booking, Seat, Movie, Cinema Interface	Khanh, Binh	3 hours	3 hours	3 hours	3 hours	3 hours
Design and Create Class Booking, Seat, Movie, Cinema Function	Toan, Nguyen	3 hours	3 hours	3 hours	3 hours	3 hours

Table 4. Sprint 4 Timeline

Sprint 4 - Payment System (17/11/2023 – 9/12/2023)						
Tasks	Responsibilities	Monday	Tuesday	Wednesday	Thursday	Friday
Define the use case and requirements for the Transaction function	All Team	4 hours	4 hours	4 hours	4 hours	4 hours
Design Payment Interface	Khanh, Binh	3 hours	3 hours	3 hours	3 hours	3 hours
Design Payment Function	Toan, Nguyen	3 hours	3 hours	3 hours	3 hours	3 hours
Testing and Debugging	Toan, Nguyen, Binh	5 hours	5 hours	5 hours	5 hours	5 hours
Write Final Report (Milestone 3)	All Team	5 hours	5 hours	5 hours	5 hours	5 hours
Preparing for presentation	All Team	2 hours	2 hours	2 hours	2 hours	2 hours

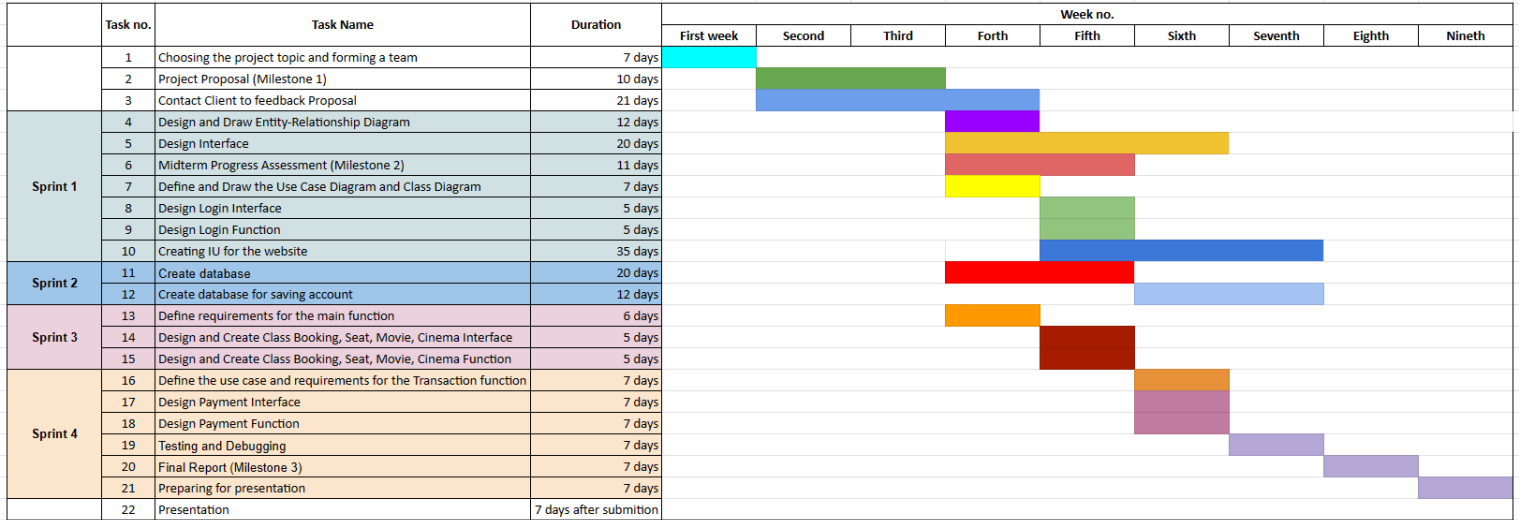


Figure 1. Gantt Chart for Project Timeline

[Here](#) is the detailed timeline grantt chart for our project!

5. Entity-Relationship Diagram (ERD)

5.1. Cardinality

- One Customer can make one or more Bookings, which also include the details of their Ticket, this will be used as a confirmation when Customer enter the Cinema
- Many Booking can be used in one Show only
- There will be many Show in the Theater, but some of the Show will show the same movie in difference time
- Many Movie will have the same director
- Each Movie will have their own Movie_Cast, this will describe who will be in the Movie, as well as their role in that Movie
- The Actor will show the detailed information of each person in the Movie_cast, which included name, gender, and ID. Each person in the Movie_Cast will have their own Actor

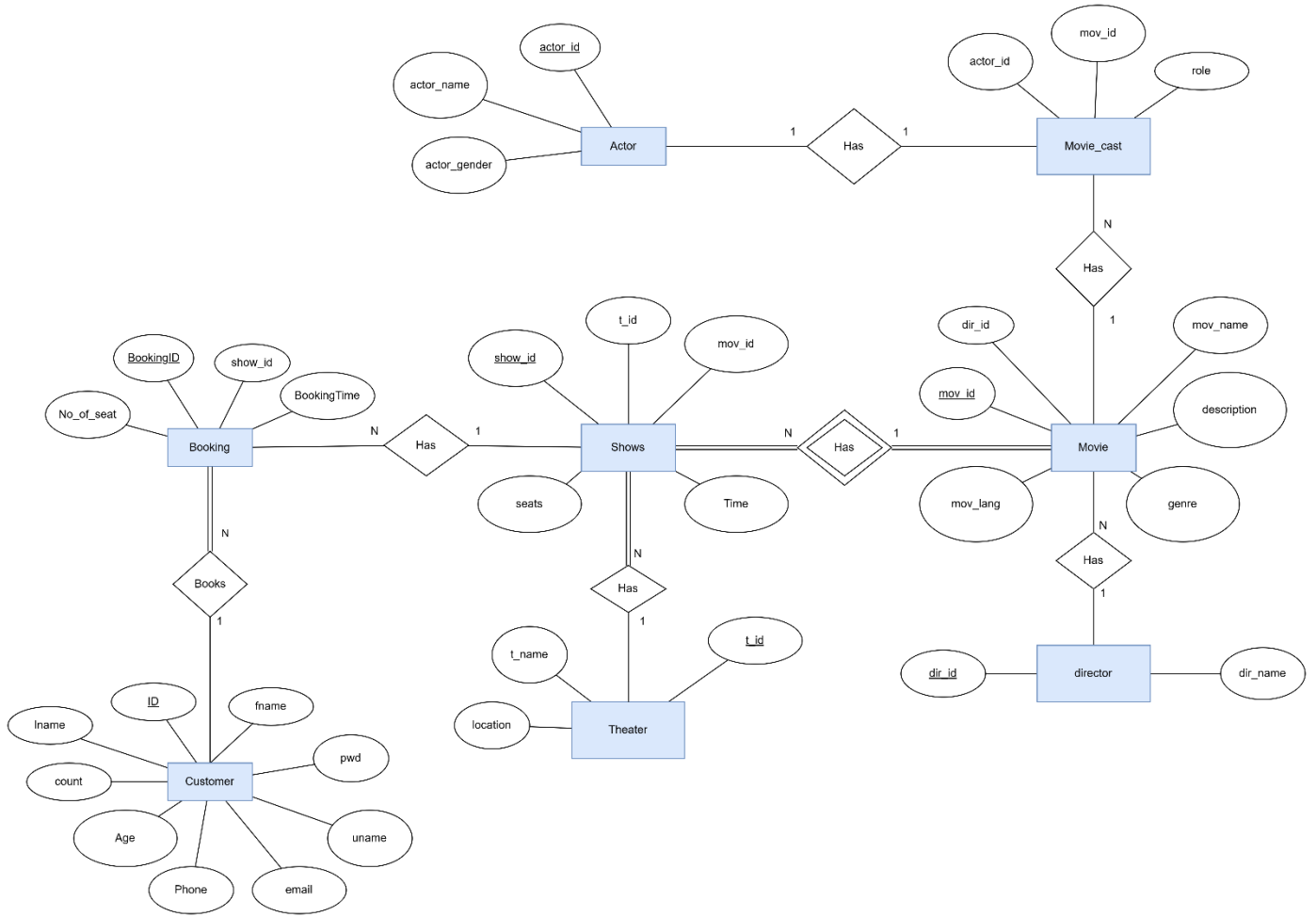


Figure 2. Entity-Relationship Diagram (ERD) for Cinema Online Booking System

5.2. Database Design - Explanation for the attributes

5.2.1. Users

Customers are those who buy movie tickets. They are the primary entity of the booking system because they are the people that use it to book movie tickets. The Customer entity saves all the information of the customer's account including the ID, which is the primary key to define a unique customer. Those information are necessary to help the cinema in managing the customer and all the booked online tickets. The customer information will be stored automatically when they adjust their profile or register the new account.

Table 5. Customer

Index	Field	Description	Type	Size
1	<u>ID</u>	user ID	Int	10
2	fname	First name of customer	varchar	255
3	lname	Last name of customer	Varchar	255
4	Email	Email of customer	Varchar	255
5	Phone	Phone number	Int	11
6	Age	Age of customer	Int	100

7	uname	User name to log in the account	Varchar	255
8	pwd	Password of the user's account	Varchar	255
9	Count		Int	100

5.2.2. Booking

The Booking entity keeps track of all the booked tickets. The primary key is the BookingID, which defines a unique booked ticket. This is essential to manage the booked tickets. Which Booking entity, the cinema can know and save the booked ticket information under. Customers can use this information to check in to the cinema at the time of the movie screening.

Table 6. Booking

Index	Field	Description	Type	Size
1	<u>booking_ID</u>	Booking ID	Int	10
2	show_id	ID of the show	varchar	255
3	no_of_seat	The number of different seats in the theater	Varchar	255
4	user_id	ID of the users	Int	10
5	booking_time	Booking time	Datetime	

5.2.3. Show

The Show entity keeps track of all the available movie and the information of the customer's seat. The primary key is the ShowID, which defines a unique showtime for each movie. This entity is essential for customer when they make a booking.

Table 7. Show

Index	Field	Description	Type	Size
1	<u>Show_id</u>	Show ID	Varchar	4
2	mov_id	Movie ID	Varchar	4
3	T_id	Theater ID	Varchar	4
5	Time	Showtime	int	10
6	SeatID	Seat ID	Varchar	255

5.2.4. Movie

The Movie entity keeps track of all the movies that are on within the cinema system at the current time of purchase. The information in this entity not only helps customers in selecting the proper movie to watch based on its contents, but it also provides the administrator with a method for updating the movie to be played and its advertising after analyzing customer preferences.

Table 8. Movie

Index	Field	Description	Type	Size
1	<u>mov_id</u>	ID of the movie	Varchar	4
2	mov_name	Name of the movie	Varchar	100
3	description	Description of the movie	Varchar	500
4	genre	Genre of the movie	Varchar	25
5	mov_lang	Language of the movie	Varchar	10

6	dir_id	Director ID	Varchar	4
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5.2.5. Theater

Theater is the list of the system's cinemas where movies are shown. Each theater has a unique id, name, and location. The TheaterID is the primary key of this entity, it is helpful to locate and manage the Theater.

Table 9. Theater

Index	Field	Description	Type	Size
1	<u>t_id</u>	ID of the theater	Varchar	4
2	t_name	Name of the theater	Varchar	20
3	location	Location of the theater	Varchar	20

5.2.6. Director

Director is the list of the directors of different movies. Each director has a unique id, name. The director_id is the primary key of this entity, it is helpful to know who that director is.

Table 10. Director

Index	Field	Description	Type	Size
1	<u>dir_id</u>	ID of the director	Varchar	4
2	dir_name	Name of the director	Varchar	20

5.2.7. Movie_cast

Movie_cast is the list of casters of movies shown. Each caster has a unique id, movie id, and role. The actor_id is the primary key of this entity, it is helpful to know who are the actors of that movie.

Table 11. Movie_cast

Index	Field	Description	Type	Size
1	actor_id	ID of the actor	Varchar	4
2	mov_id	ID of the movie	Varchar	4
3	role	Role of each actor	Varchar	20

5.2.8. Actor

Actor is the list of casters. Each caster has a unique id, name and gender. The actor_id is the primary key of this entity, it is helpful to know who the actor is.

Table 12. Actor

Index	Field	Description	Type	Size
1	actor_id	ID of the actor	Varchar	4
2	actor_name	Name of the actor	Varchar	20
3	actor_gender	Gender of the actor	Varchar	7

5.3. Relational Model

This is our Relational Model^[3], which is converted from the Database Design above:

1. **Users** (ID, FName, LName, Age, Phone, Email, Uname, pwd, count)
2. **Booking** (BookingID, showID, no_of_seats, Booking_time, userID)
3. **Shows** (ShowID, t_id, mov_id, time, seats)
4. **Theater** (TheaterID, TheaterName, TheaterLocation)

5. **Movie** (MovID, Mov_name, description, genre, mov_lang, dir_id)
6. **Director** (dir_id, dir_name)
7. **Movie_cast** (actor_id, mov_id, role)
8. **Actor** (Actor_id, actor_name, actor_genre)

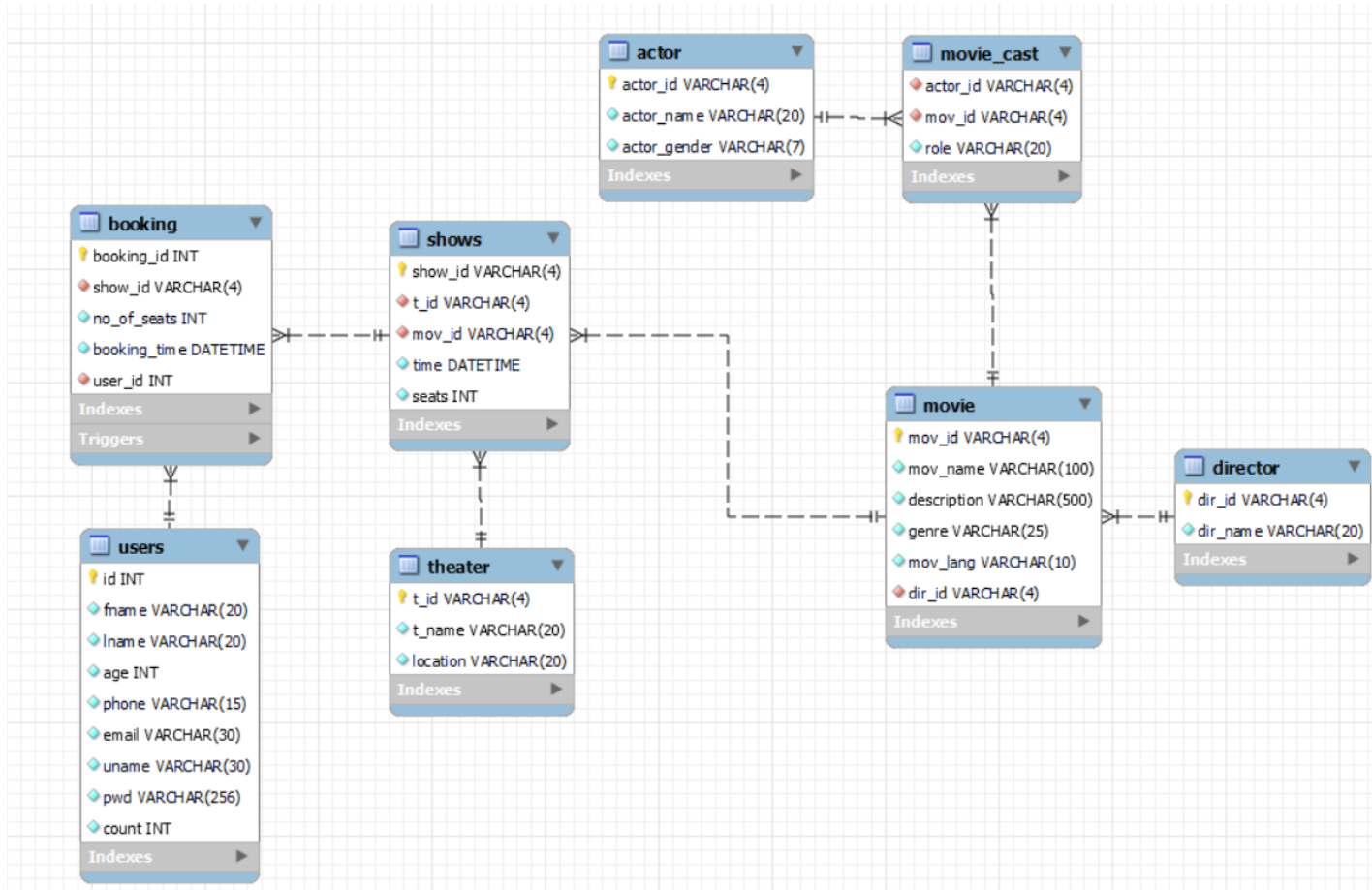


Figure 3. Relational Model for Cinema Online Booking System

6. Use Case, Stakeholders and Requirements

6.1. Use Case Diagram

- Use Case Name: Cinema Online Booking System
- Actors:
 - Customer: The individual who wants to book tickets for a movie.
 - Admin: The system administrator responsible for managing the online cinema platform.
 - Guest: A potential customer who visits the online cinema platform but has not signed up for an account.
- Description: The Online Cinema Booking System facilitates the process of booking and purchasing movie tickets through an online platform. This system aims to provide customers with a convenient and efficient way to browse, select, and secure tickets for

their preferred movies, while also enabling the admin to manage movie listings, user accounts, and overall system functionality. This use case allows for a clear distinction between the capabilities of guests, customers, and admins, ensuring that each actor has access to the appropriate functionalities within the Online Cinema Booking System

- Extend Relationship: The “Select movie from...” use case may extend from the “Search movie” use case when the user wants to choose a specific movie in specific title/genre/language/date release, but it is an optional step.
- Basic flow:
 - Guest Movie Search:
 - The guest opens the online cinema website or mobile app.
 - The guest is limited to searching for movies based on genre, language, and showtimes.
 - Customer Login:
 - The customer logs in to their account, providing necessary credentials.
 - Customer Browsing:
 - The customer can browse the list of available movies, filtering by genre, language, and showtimes.
 - Customer Creating Booking:
 - The customer selects a movie of interest.
 - The customer views available showtimes for the selected movie.
 - The customer chooses a preferred showtime.
 - Customer Selecting Seats:
 - The system displays a seating layout for the selected showtime.
 - The customer selects the desired seats for the chosen showtime.
 - Payment:
 - The customer proceeds to checkout.
 - The system prompts the customer to enter payment details (credit card, digital wallet, etc.).
 - The system allows the customer to apply coupons or discounts if available.
 - The system confirms the booking and issues a digital ticket upon successful payment.
 - View and Cancel Booking:
 - The customer can view their booking details, including movie, showtime, and seat assignment.
 - The customer has the option to cancel the booking, with possible refund conditions.
 - Admin Login:
 - The admin logs in to the system, providing necessary credentials.
 - Movie Management:
 - The admin can add, edit, or remove movie listings.
 - The admin can modify details such as movie title, genre, and language.
 - Show Management:

- The admin can add, edit, or cancel shows.
- The admin can manage available seats for each show.

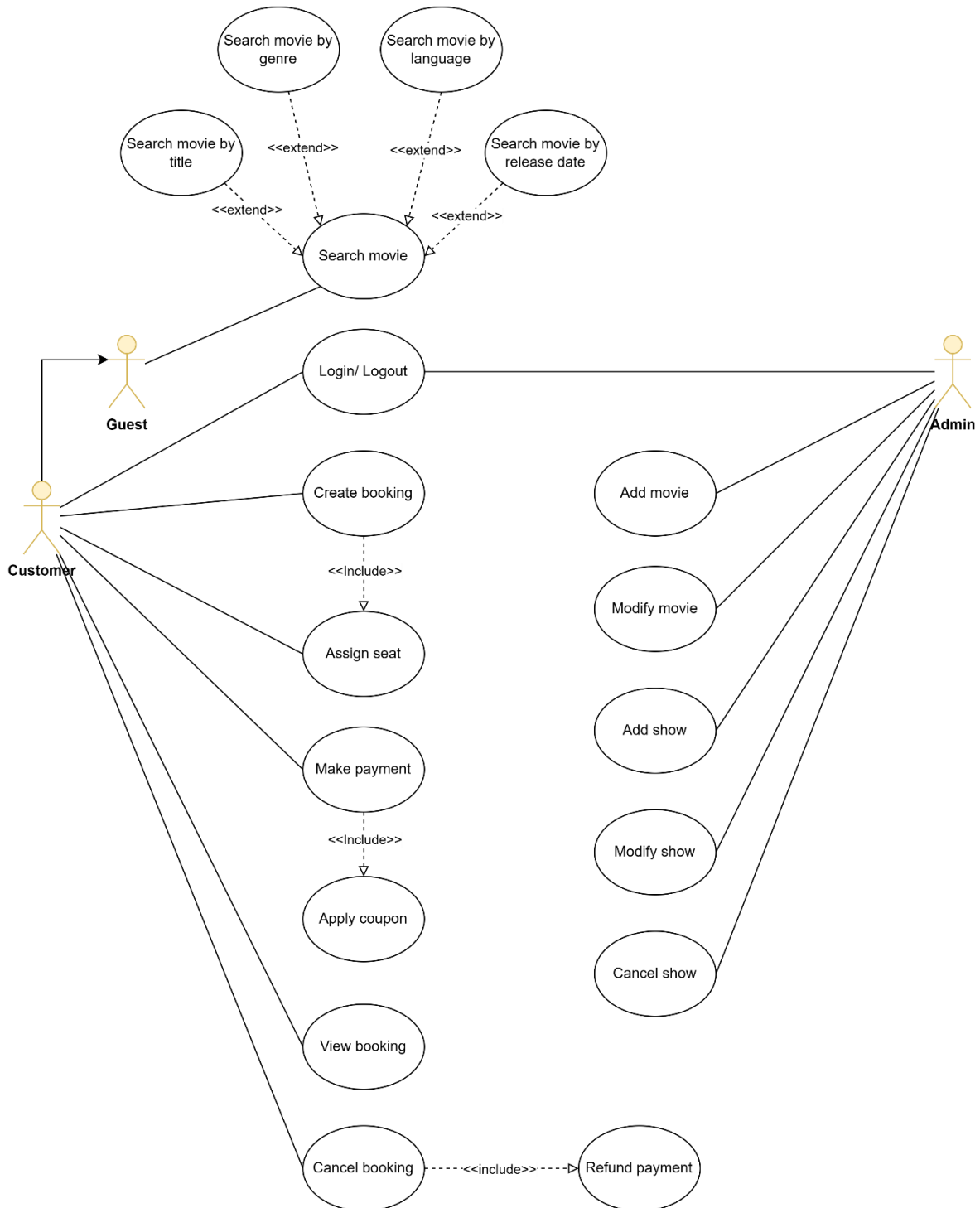


Figure 4. Use Case Diagram for Cinema Online Booking System

6.2. Actors and Goals

1. Guest:

- **Description:** The Guest is simply the customer, but they have not login
- **Capabilities:** Search movie

2. Customer:

- **Description:** The customer is the primary user of the cinema booking system. Their main job is to browse available movies, select showtimes, choose seats, and make reservations or purchases.
- **Capabilities:**
 - View movie listings and showtimes.
 - Login, Logout.
 - Select preferred seats or let the system suggest available seats.
 - Make reservations or purchase tickets.
 - Cancel or change existing bookings.
 - View personal booking history and preferences.
 - Cancel booking.
 - Refund payment.

3. Admin/Manager:

- **Description:** The admin or manager handles overseeing and managing the cinema operations. They control the overall system, including movie schedules, seating arrangements, and user accounts.
- **Capabilities:**
 - Manage movie listings and showtimes.
 - Configure seating arrangements and theater settings.
 - Add or remove movies from the system.
 - Handle customer inquiries and support.
 - Monitor and generate reports on booking statistics.
 - Cancel show or movie

6.3. Stakeholders and Functionality

We have defined our Stakeholders^[6] and Functionality in our Cinema System:

- **Customer:**
 - **Benefits:**
 - **Convenience:** Customers can easily browse through movie listings, check showtimes, and book tickets from the comfort of their homes using the cinema system website. This eliminates the need to visit the physical cinema or stand in long queues.
 - **Seat Selection:** The system allows customers to view and choose their preferred seats, providing a personalized cinema experience. This ensures that customers can select seats according to their preferences and needs.

- **Time Efficiency:** With the ability to check showtimes and availability in real-time, customers can quickly plan their movie outings without the hassle of calling or physically visiting the cinema.
- **Theater Manager:**
 - **Benefits:**
 - **Efficient Scheduling:** Theater managers can easily update and manage movie schedules, ensuring accurate and up-to-date information is available to customers. This contributes to efficient planning and utilization of cinema resources.
 - **Seating Management:** The system allows for easy configuration of seating arrangements, helping theater managers optimize occupancy and maximize revenue. They can also monitor seat bookings and adjust accordingly for popular movies or events.
 - **Data Insights:** The cinema system provides valuable insights through reports and analytics, helping managers understand customer preferences, popular showtimes, and overall performance metrics. This information is crucial for strategic decision-making.
- **CEO of the Theater:**
 - **Benefits:**
 - **Revenue Optimization:** The cinema system contributes to revenue optimization by allowing the CEO to track ticket sales, popular movies, and peak hours. This information helps in strategic planning for marketing and promotions.
 - **Customer Satisfaction:** With a user-friendly booking system, the CEO can ensure a positive customer experience, leading to customer satisfaction and repeat business. Happy customers are more likely to become loyal patrons of the cinema.
 - **Operational Efficiency:** The CEO benefits from improved operational efficiency through the automation of booking processes, reducing manual workload and minimizing errors. This allows the cinema to run smoothly and enhance overall efficiency.
- **Moviegoer Club Member:**
 - **Benefits:**
 - **Exclusive Access:** Club members gain exclusive access to promotions, discounts, and advanced booking options, fostering a sense of loyalty.
 - **Rewards Program:** Accumulating points through bookings leads to rewards such as free tickets, concessions, or special screenings, enhancing the overall moviegoing experience.
 - **Personalization:** The system tailors recommendations based on the member's viewing history, ensuring a personalized and enjoyable cinematic journey.

- **Group Coordinator:**
 - **Benefits:**
 - **Streamlined Reservations:** Coordinators can easily reserve a block of tickets, simplifying the process for organizing group outings or events.
 - **Customized Packages:** The system allows coordinators to customize group packages, providing flexibility and catering to specific needs.
 - **Efficient Billing:** Group coordinators benefit from consolidated billing and reporting, facilitating seamless financial transactions for large groups.
- **Technical Support:**
 - **Benefits:**
 - **Efficient Issue Resolution:** Technical support can quickly identify and resolve issues related to account management, ticket purchases, or website errors, ensuring a smooth user experience.
 - **Customer Satisfaction:** Timely assistance enhances customer satisfaction, reducing frustration and promoting a positive perception of the cinema's services.
 - **User Feedback:** Technical support can gather valuable feedback on system performance and user concerns, contributing to system improvements.
- **Marketing Team:**
 - **Benefits:**
 - **Integrated Campaigns:** The system allows the marketing team to seamlessly integrate promotional campaigns into the booking process, increasing the visibility of special offers.
 - **Performance Analytics:** Marketing teams can track the effectiveness of campaigns through the system, analyzing booking patterns and customer responses.
 - **Targeted Promotions:** Access to user data enables the marketing team to tailor promotions based on customer preferences, enhancing the impact of marketing efforts.
- **Movie Distributor:**
 - **Benefits:**
 - **Scheduling Coordination:** Distributors can coordinate with cinemas for optimal movie scheduling, ensuring effective screening times for maximum audience reach.
 - **Performance Insights:** Access to reports on the performance of movies in different theaters helps distributors understand audience preferences and refine their distribution strategies.
 - **Promotional Collaboration:** The system facilitates collaboration between distributors and cinemas for joint promotional efforts, maximizing the success of movie releases.

- **Concession Stand Staff:**

- **Benefits:**

- **Real-time Updates:** Concession stand staff can receive real-time updates on booked showtimes, allowing for efficient planning of inventory and staffing.
- **Promotion Alignment:** The system enables coordination between movie schedules and concession promotions, maximizing sales opportunities.
- **Customer Service Enhancement:** Awareness of booking patterns allows the concession stand staff to anticipate customer demand, enhancing overall customer service.

6.4. System Activity Diagram

We have 2 Activity Diagram symbolize for 2 Activities: Cancel a booking^[5] and Make a booking^[5]

6.4.1. Cancel a booking Activity Diagram

Customers can cancel their bookings by searching for their booking number and choose to cancel the booking. The system will check whether the cancelling was made before the deadline, if yes, the customer can be refunded, if not there will be no refund issued. Finally, an

email will be sent to the customer to confirm their cancellation .Here are the steps to cancel a booking:

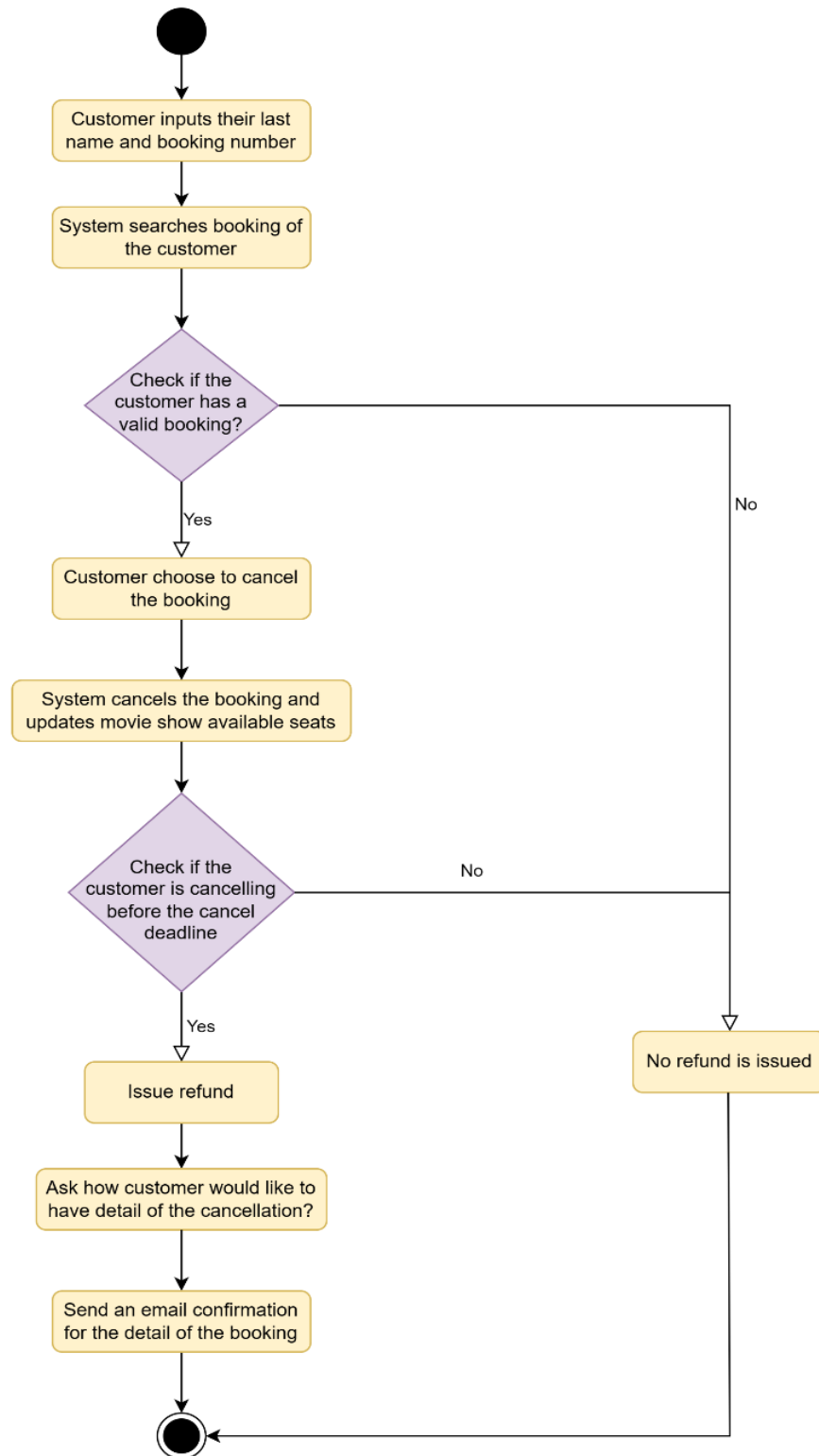


Figure 5. Activity Diagram for Cancelling a booking

6.4.2. Make a booking Activity Diagram

Any registered member can perform this activity. First, the customer will looking for the movie they want to watch. Then, they will select the seats, showtime, and payment method. After the transaction, the system will send an email to the customer to confirm their booking . Here are the steps to book a ticket for a show:

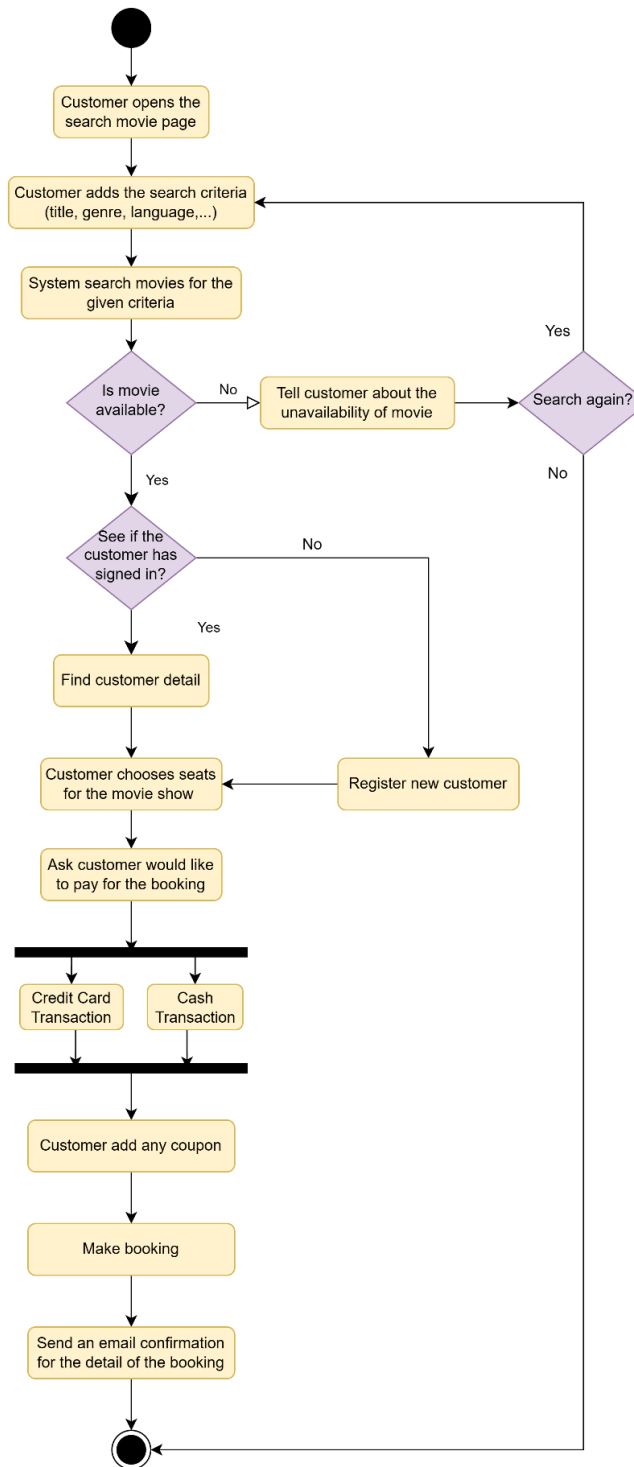


Figure 6. Activity Diagram for Making a booking

6.5. System Sequence Diagram

This is a Sequence Diagram^[7] for the Use Case “Create booking” in our system, describing the process of buying movie ticket with 3 main actors: Guest, Customer, Admin based on the Use Case diagram

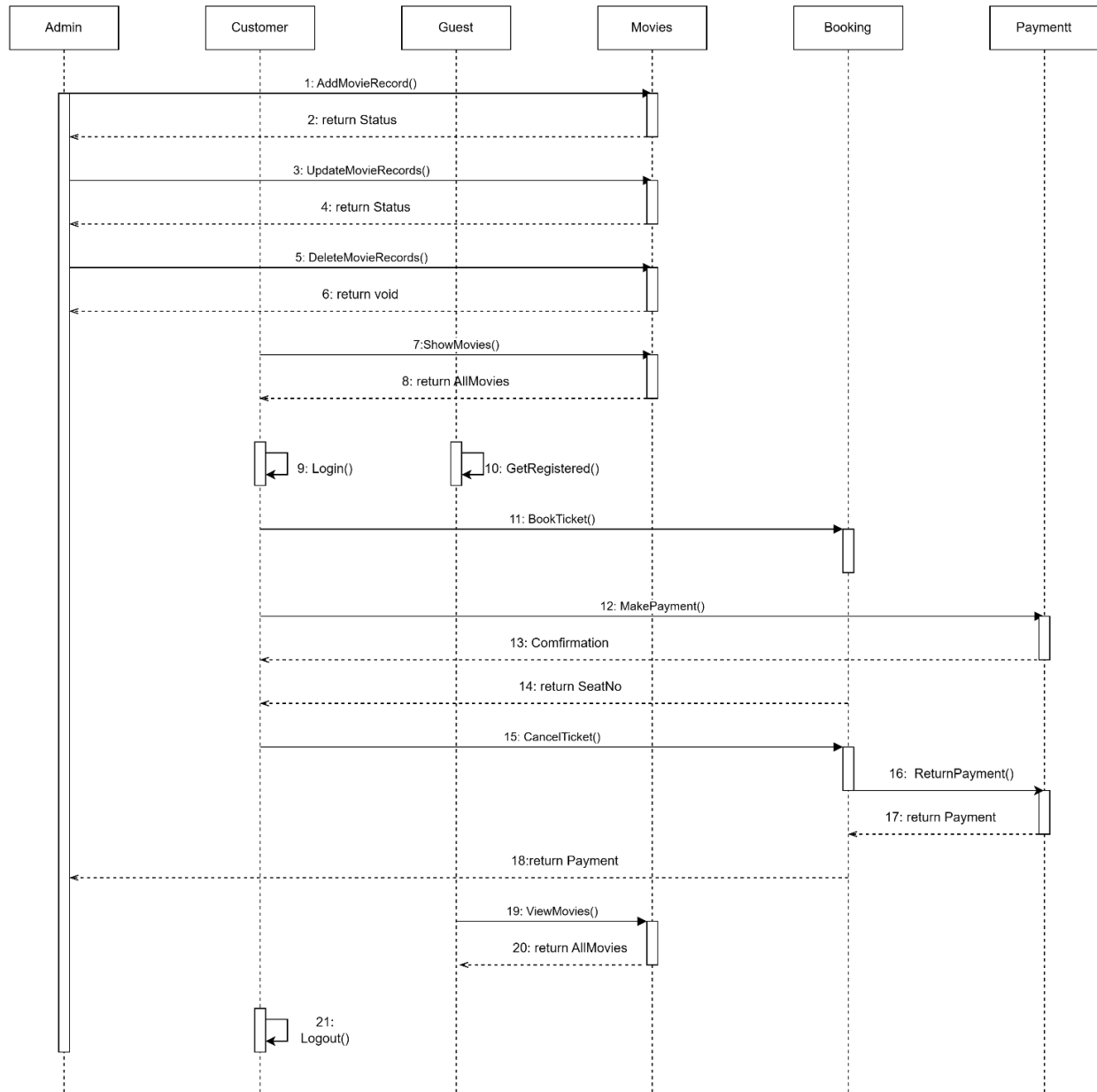


Figure 7. Sequence Diagram for “Create Booking”

7. Software Testing

7.1. Unit Test

- Login Functionality: A unit test could verify that the login function correctly authenticates users and handles different scenarios, such as valid and invalid credentials.

- Seat Selection Algorithm: Unit tests could evaluate the seat selection algorithm to ensure it properly assigns seats, handles seat availability, and handles edge cases, such as when multiple users try to book the same seat simultaneously.
- Payment Processing: Unit tests for payment processing code would validate that payments are processed accurately, and any potential errors are handled gracefully.

7.2. Integration Test

- User Authentication and Payment: Integration tests may focus on the interaction between the user authentication module and the payment gateway, ensuring that user data is correctly transferred, and payments are processed accurately.
- Seat Availability and Booking: These tests verify that the seat selection module communicates effectively with the seat availability database, allowing users to select available seats and complete bookings.
- Notification Services: Integration tests may assess whether the system correctly interfaces with email or SMS notification services, ensuring that customers receive booking confirmations and other relevant information.

8. Challenges

8.1. Problems

- Since this is the first time our team has created a responsive website using a database, we are unsure what to do first, such as building UI or creating databases first.
- About design UI problems, create mobile compatibility is also a big deal with us when all members don't have too much knowledge about designing website on mobile.
- Having a solid foundation in design was necessary to create a simple, elegant user interface that clients could easily access and utilize.
- For all members, creating a secure database and transaction system is a difficult task.
- We also have difficulty with finding a well-regarded supplier to buy good domain, sever or hosting.
- Moreover, finding a way to protect our website and user data from cyberattacks and security breaches is becoming a big problem with us.

8.2. Solutions

- Watch reliable tutorial on the Internet, or ask people who have experience in this field to help us having a general understanding of build a website
- Do more research and find more information about topic, as well as looking for some references about the User Interface of a Cinema Booking System
- Training more about design for both desktop interface and mobile interface to release a more friendly-user interface.
- Systematizing data to help the construction of a more accessible database.
- Inquire with predecessors about reputable sources for domain, hosting, and server providers.
- Looking for many ways to enhance the fire wall of our website or buy a security packsack.

Chapter III: RESULTS AND DISCUSSION

9. System Design and Architecture

This is the Github link for our project: [duwcston/Cinema-Booking-System \(github.com\)](https://github.com/duwcston/Cinema-Booking-System)

9.1. System Class Diagram

Here are the main classes of the Cinema Online Booking System:

- Account: Admin will be able to add/remove movies and shows
- Guest: Guests can search and view movies descriptions. To make a booking for a show they have to become a registered member.
- Customers: A registered member, who can search for movies and make bookings for shows.
- Cinema: The main part of the organization for which this software has been designed. It has attributes like 'name' to distinguish it from other cinemas.
- Hall: Each cinema will have multiple halls containing multiple seats.
- Movie: The main entity of the system. Movies have attributes like title, description, language, genre, release date, city name, etc.
- Show: Each movie can have many shows; each show will be played in a cinema hall.
- SeatDetail: Each cinema hall will have many seats.
- Seat: Each Seat will correspond to a movie Show and a SeatDetail. Customers will make a booking against a Seat.
- Booking: A booking is against a movie show and has attributes like a unique booking number, number of seats, and status.
- Payment: Responsible for collecting payments from customers.

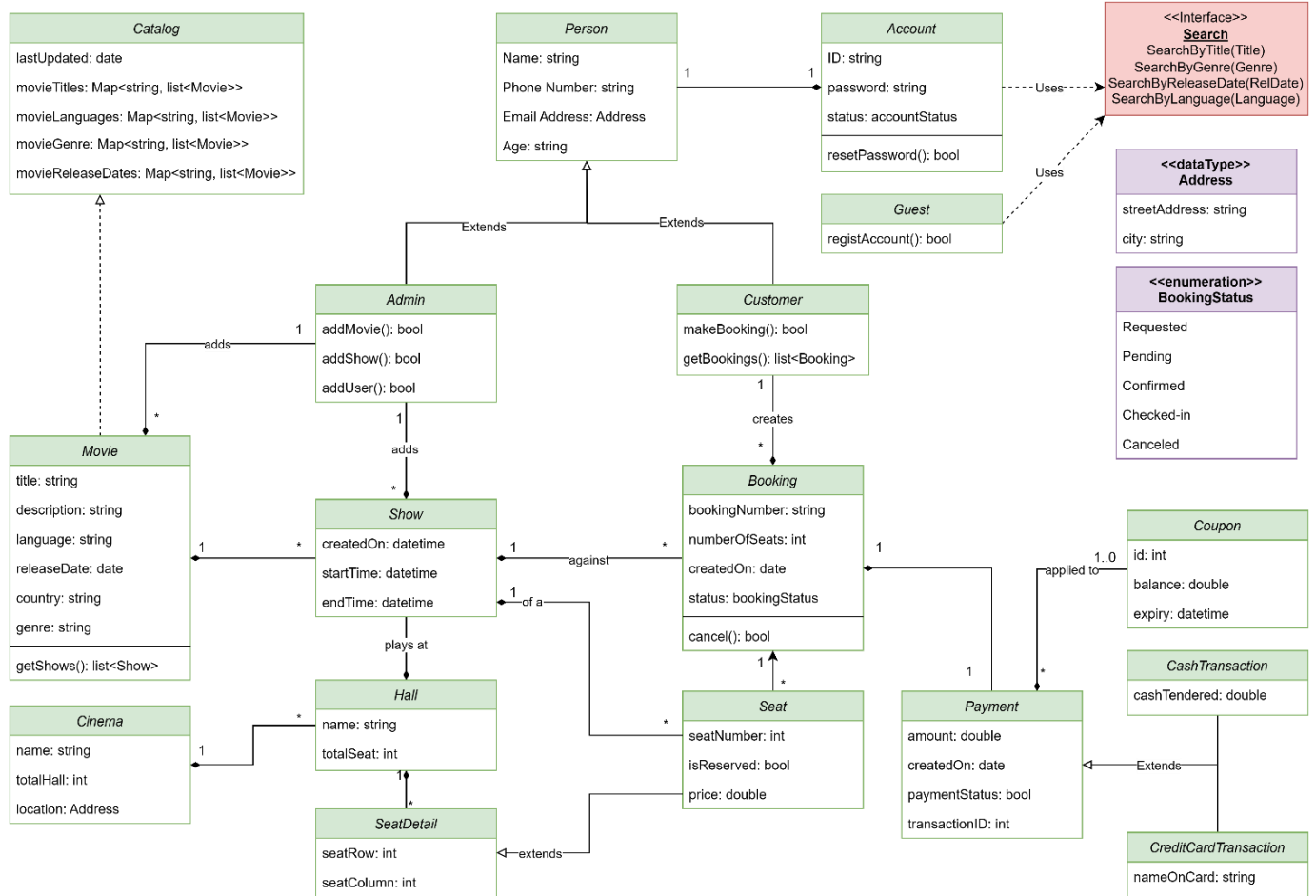


Figure 8. Class Diagram for Cinema Online Booking System

9.2. System Interface

9.2.1. Login and Register Page

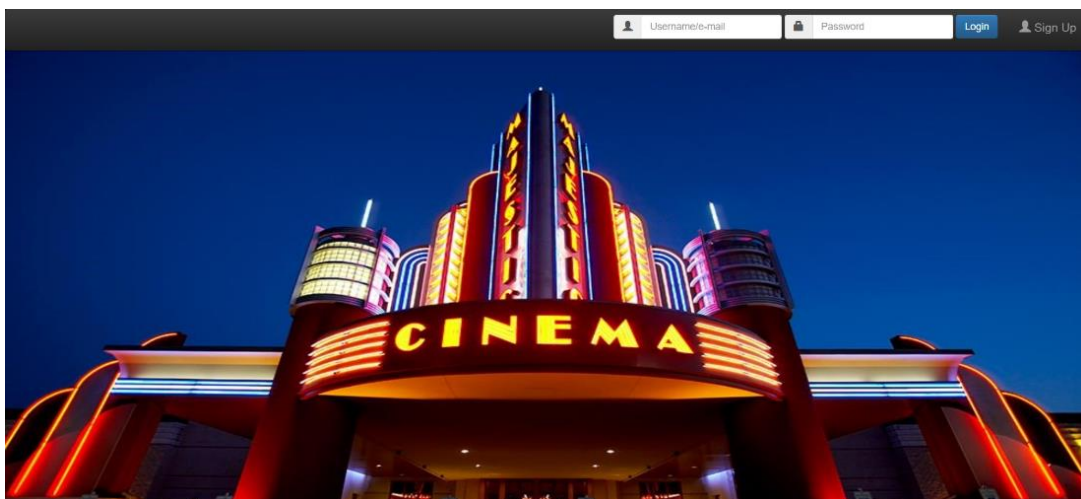


Figure 9. Login Screen



Figure 10. Register Screen

This is our login and registration page, designed for easy navigation and user-friendly interaction. As you can see, the process is straightforward and user-friendly, ensuring a comfortable experience for everyone.

9.2.2. Homepage

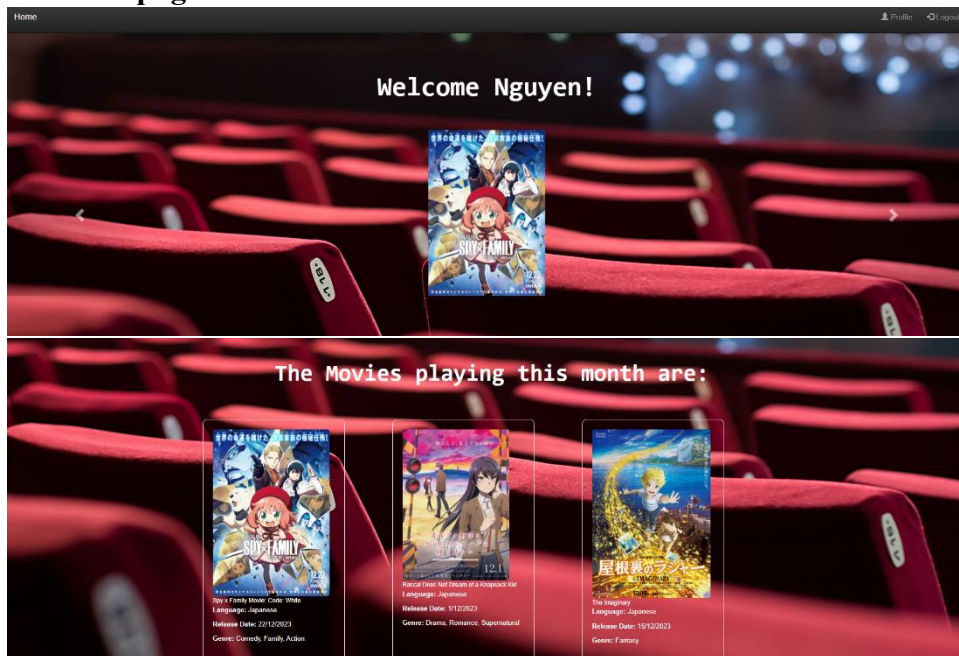


Figure 11. Homepage Screen

This is our homepage. In the header, you can find a button leading to the main page and a profile button to review your registrations, along with a logout option. Below, there are featured movies for the month, each linking to their information page for a quick overview and ticket booking convenience

9.2.3. Movie and booking page

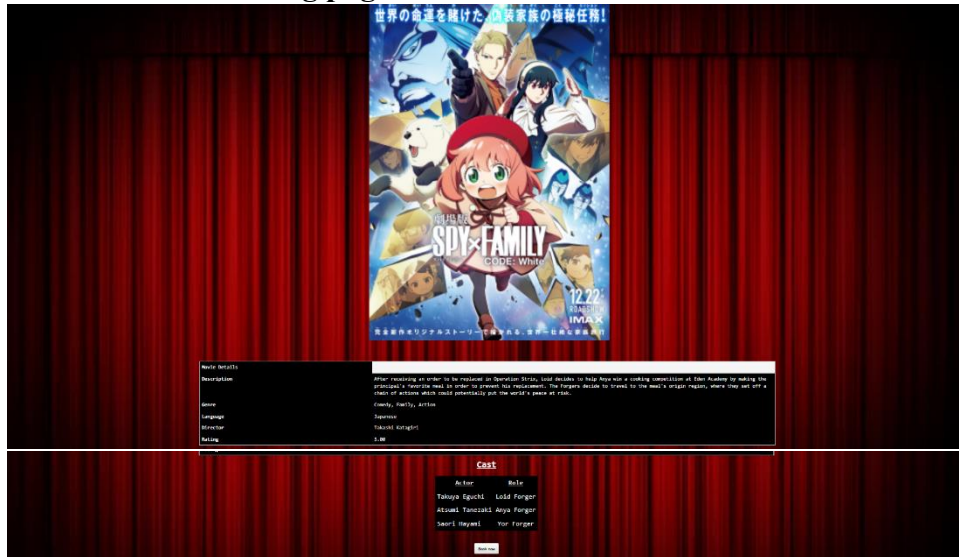


Figure 12. Movie Screen

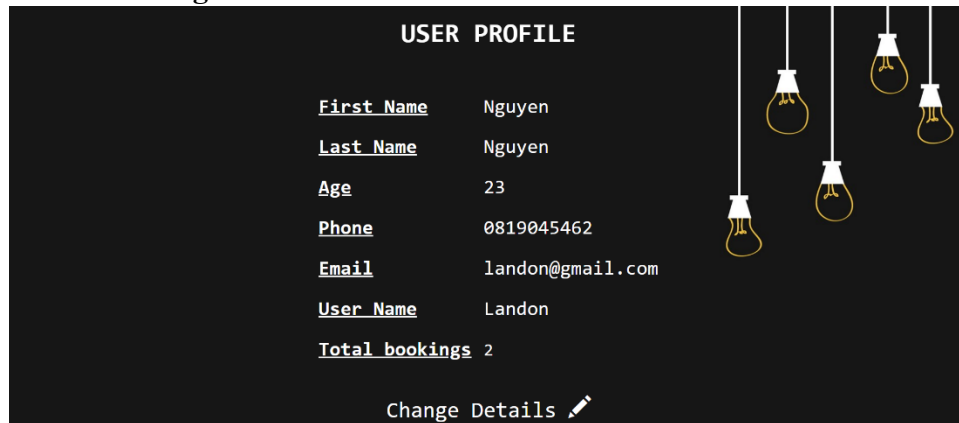
As you can see, all the details about the movie, including the cast, are available here. Additionally, at the bottom, there is a 'Book now' button, allowing you to reserve seats for the movie.



Figure 13. Booking Screen

After clicking 'Book now,' the booking page for that movie will appear. Here, you can view the schedule, available theaters, and the remaining seat count. Once you select the showtime code, you can proceed to choose the number of seats you'd like to reserve.

9.2.4. Profile Page



The image shows a 'USER PROFILE' screen with a dark background. On the right side, there are five yellow lightbulb icons hanging from the top. The profile information is listed in a table-like format with labels underlined. At the bottom, there is a 'Change Details' button with a pencil icon.

<u>First Name</u>	Nguyen
<u>Last Name</u>	Nguyen
<u>Age</u>	23
<u>Phone</u>	0819045462
<u>Email</u>	london@gmail.com
<u>User Name</u>	Landon
<u>Total bookings</u>	2


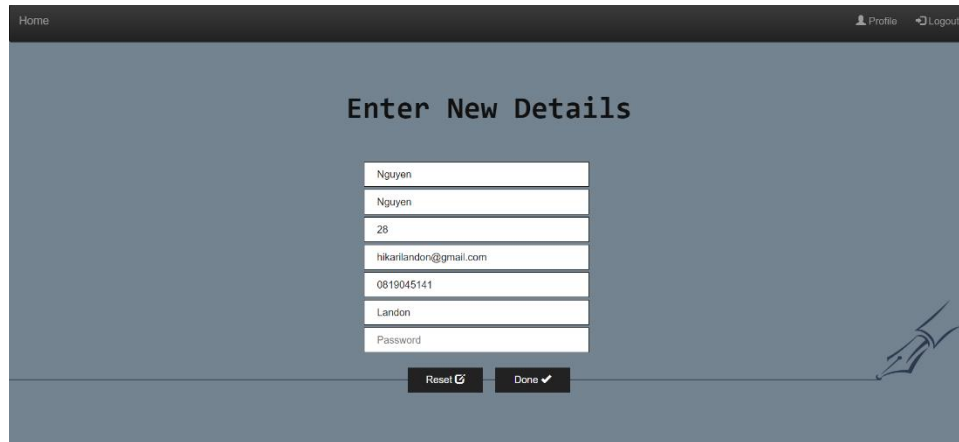
Change Details 

Figure 14. Profile Screen

This is the User Profile Page, where you can view the information you've provided to us. If you wish to edit these details, simply click on 'Change Details' to initiate the process of updating your information.



The image shows an 'Enter New Details' screen. At the top, there is a navigation bar with 'Home' on the left and 'Profile' and 'Logout' on the right. The main content area has a title 'Enter New Details' and a form with several input fields. At the bottom, there are 'Reset' and 'Done' buttons. A pen icon is visible on the right side of the form.

Home Profile Logout

Enter New Details

Nguyen
Nguyen
28
hikarilandon@gmail.com
0819045141
Landon
Password

Reset Done

Figure 15. Edit Profile Screen

This is where you can edit your personal information. After entering all the necessary edits, you can press 'Done' for the system to save the changes, or you can choose 'Reset' if you want to revert the form to its original state.

9.3. System Test

Pre-conditions: Databases need to have Login data. Front-end and Back-end connection. Client Identify.	
Test Case ID: 001	Test Case Name: Login
System: Login system	Subsystem: Back-End Server
Short Description: Checking Login System	

Step	Action	Expected System Response	Pass/Fail	Comments
1	Input a valid username and password into the respective fields.	The system should accept the credentials and proceed to authenticate the user.	Pass	Check that the system recognizes valid user credentials directed to the appropriate page
2	Press Logout button	The system should cancel the session and redirecting to the login page again.	Pass	
3	Input an invalid username or password.	The system should display an error message indicating that the credentials are incorrect.	Pass	
4	Leave all input empty and press Login button	The system should display an error message indicating that the credentials are incorrect.	Pass	Confirm that the system does not grant access with incorrect credentials and shows appropriate error messaging.

Table 13. Test Case for Login System

Test Case ID: 002	Test Case Name: Booking
System: Booking system	Subsystem: Back-End Server
Short Description: Checking Booking System	

Pre-conditions:

Databases need to have Show data.

Front-end and Back-end connection.

Client Identify.

Step	Action	Expected System Response	Pass/Fail	Comments
1	Navigate to the booking page by selecting a movie and clicking on the "Book Now" button	The booking page should load, displaying the movie details, available showtimes.	Pass	Ensure that the booking page is accessible and loads without any errors.
2	After selecting the choice, click on the "Confirm" button.	The system should navigate to the confirm page, summarizing the booking details and providing options for payment.	Pass	
3	Click "Confirm" without choosing any choice	The system should display an error message indicating that the the field are empty	Pass	Ensure that the booking process is smooth, and the user receives a confirmation of the booking.
4	Click "Cancel" when confirming for the booking	The system should display an window that annouce Successfully Cancele	Pass	

Table 14. Test Case for Booking System

Chapter IV: CONCLUSION

10. Final Report and Feedback

10.1. Summary

In summary, we have finished most of the basic tasks and finalized our project with a full database and an online booking cinema website has almost all the function for users can use to book a ticket. But many things as can see on design that we also plan can't work, and we must leave it aside for now because we have no time to fix and implement.

10.2. Client's feedback

The following are the feedback of our client about what we should add in the project:

- **Releasing time:** Estimate the time that the project is releasing
- **Public Relations (PR):** After the website's construction, the development of a promotional plan to attract users is essential. Online marketing strategies, such as Search Engine Optimization (SEO) and running advertising campaigns on social media platforms, will be implemented. The timeline for this phase typically depends on the competitiveness of the target market and the extent of SEO work required. A minimum of 3-6 months is usually necessary for SEO to show significant results, but ongoing efforts may continue beyond that timeframe.
- **Optimization:** Optimize the website to ensure fast loading times and compatibility with various mobile devices and operating systems is critical. The timeline for this phase will depend on the current state of the website and the extent of improvements needed. It may range from a few weeks to several months, considering testing and fine-tuning.
- **Security:** Ensuring the security of users' personal information during registration and login processes is of paramount importance. The timeline for implementing security measures depends on the complexity of the website and the specific security measures to be integrated. This could take anywhere from a few weeks to a few months.
- **Incentive Programs:** Developing and implementing incentive programs for different user groups, such as members, students, and seniors, can vary in complexity. The timeline for this phase will depend on the complexity of the programs and how they are integrated into the website. It might take a few weeks to a couple of months.

10.3. Future plans

- The most important plan is to fix all the errors and solve all the remaining problems like payment and having a more appealing UI.
- Upgrade the system to have an admin page that can do all administrative work there instead of working on database.
- We also need to develop a system that can automatically put new Movie on homepage instead of doing manual on code.
- For a better customer experience, the demo of the project will be published for the approval of the members to collect more feedback. So, the performance of the UI and system will be optimized.
- Based on all demo feedback, the project release date will be announced to the clients as soon as possible.

- The marketing campaign of the project will be divided into two parts: first, throughout the social media pages of students and young people, which are the most potential customers of the cinema, advertisements will be uploaded rapidly to attract customers. Also, the cinema will work with many third-party payment apps to provide different vouchers and discounts for customers when they buy the tickets via those applications.

11. References

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- [7]. Parimal Mehta & Parth Panchal (2018). "Movie Ticket Booking System". [16BCE118_Movie Ticket Booking System_Project.doc - Google Drive](https://drive.google.com/file/d/16BCE118_Movie_Ticket_Booking_System_Project/docx?usp=sharing)