WOLKITE UNIVERSITY

COLLEGE OF COMPUTING AND INFORMATICS

DEPARTMENT OF INFORMATION TECHNOLOGY

PROJECT TITLE: ONLINE TICKET RESERVATION SYSTEM FOR

ALEM CINEMA

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DECLARATION

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ABBREVIATION

HTML – HipherTextMarkupLanguage

OOSAD - Object Oriented System Analysis and Design

OOA - Object-Oriented Analysis

API - Application Programming Interface

IDE - Integrated Development Environment

UML - Unified modeling language

UC - Use Case

MD5 - message digest 5

MTD. - Movie Ticket Dispenser

BR – Business Rule

REQ - Requirement

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CHAPTER ONE

1 INTRODUCTION

The entertainment industry is one of the most profitable sectors in the business world. People always spent money for being entertained, and so will they in the future. The only problem is how people get to know about all the currently presented movies as well as the future ones, and then, in case they know, how they can get tickets. This problem used to be solved by theaters' ticket kiosks at the Showtime or by phone reservation which are in most cases restricted by time, location, and most important by availability of tickets. Because of that reason our document will describe the implementation details of a Movie Ticket Dispenser (MTD). The system will allow the user to buy tickets online for movies that are either stored in the system's own database or available using web services offered by the Entertainment companies, but accessed by the MTD. Bookings can be made independent of time and location.

Alem Cinema ticket reservation system aims at helping cinema customers on how to make bookings and reservation for cinema and to minimize the hassle of travelling down to the cinema location before making reservations and queuing up for tickets to avoid congestions. This involves making the customer aware of seat reservation schemes. Cinema Ticket booking system achieves this using cinema booking software, which will contain various events that result into a graphical interface booking system which even special people can make reservations. This paper makes it easy to make reservations for users to watch a movie at will any time they want and anywhere they choose as long as they are connected to the Internet instead of travelling down to the booking center and this is time wasting. Being an online booking system, it will assist managers and administrators to update movie information that can be accessed by customers, help confirm reservations and educate the customers on how to book cinema ticket, and seat reservation online in such a way that the congestion involved would be reduced. Online cinema ticket booking system is needed in order to run a check on the authenticity of the tickets to avoid fraud manipulated booking.

1.1 Organizational Background

Alem Cinema is a pioneer and leader in the cinema industry. It was the first privately owned cinema in Ethiopia opened in April 2004. Alem Cinema is committed to nurture the advancement of the cinema business. It is very reputable for creating opportunities to domestic filmmakers who produce films in local languages.

For the past 15 years, Alem Cinema has been the preferred choice because they offer many attractive benefits such as refreshments, comfort seating, and clear screenings. The cinema operates two movie theaters with a combined seat capacity of over 700.

They consistently offer new entertaining movies in Amharic on a regular basis (Monday to Sunday). They have three spots everyday scheduled in two hour intervals at each of the two theaters. Saturday and Sunday we screen children's films as well. Alem Cinema's staff will ensure our customers are well treated and that they enjoy themselves during their visit.

1.2 Statement of the problem

Alem Cinema currently uses a manual system. Due to this cause, the cinema is under several problems that negatively affects the reliability, performance, efficiency and effectiveness of day to day activities.

The system is very time consuming and lazy. This system is more prone to errors and sometimes the approach to various problems is unstructured

Some of the major problems are:

1. Errors and inaccuracies: Manual reservation systems is more prone to human errors, such as double-booking seats or entering incorrect information, which can lead to customer complaints and confusion.
2. Inefficiency: Manual reservation systems is time-consuming and labor-intensive, resulting in long wait times for customers and lost sales for the cinema.
3. Lack of real-time information: Manual systems do not provide up-to-date information on seat availability, making it difficult for customers to know if a particular movie is sold out until they arrive at the cinema.
4. Limited scalability: Manual reservation systems cannot handle a high volume of ticket sales, limiting the cinema's ability to grow and expand its operations.
5. Inability to track customer behavior: Manual systems does not have the capability to collect and analyze data on ticket sales and customer behavior, making it difficult for the cinema to make informed decisions about marketing strategies and operations.
6. Poor customer experience: The manual reservation systems lead to long wait times and other inconveniences for customers, resulting in a poor customer experience and potentially lost business for the cinema.

- To overcome the above problem, we proposed an online cinema ticket reservation system involves implementing various strategies, such as enhancing the user interface, improving data validation, implementing effective error handling, ensuring system stability and scalability, providing customer support, and conducting regular maintenance. These approaches aim to create a better user experience, reduce errors, and increase customer satisfaction.

1.3 Objectives of the project

1.3.1 General objectives

The general objective of this project is develop online cinema ticket reservation system for Alem Cinema.

1.3.2 Specific objectives

To achieve the above stated general objective, we formulate the following specific objectives

- To create engaging user interfaces
- To create and implement a database for the proposed system
- To Analyze the requirements and design an online system.
- To model the system using object oriented system and analysis approach.
- To secure the current system, protect against data damage, unauthorized effects, and data loss.
- To deploy our system for the users.

1.4 Feasibility Study the System

The feasibility study is the preliminary study that determines whether a proposed system project is financially, technically and operationally viable. Feasibility study is essential to evaluate the cost and benefits of the new system. The alternative analysis usually include as part of the feasibility study, identifies viable alternatives for the system design and development.

1.4.1 Technical Feasibility

- The cinema currently has a website that could be used to host the reservation system, so no new infrastructure is needed.
- The reservation system will be built using modern web technologies such as HTML, CSS, JavaScript, and PHP, which are already familiar to the cinema's IT team.
- The reservation system will use a database to store customer and ticket information, and the cinema already has a database server that can be used for this purpose.

1.4.2 Operational Feasibility

- The reservation system can be easily integrated into the cinema's existing website and ticketing process. Customers will be able to reserve tickets online and receive confirmation via email or SMS.
- The cinema's staff will be able to access the reservation system through a user-friendly dashboard, where they can manage ticket inventory, view customer information, and generate reports.
- The reservation system will not require significant additional staffing, as the existing ticketing staff will be able to handle the increased volume of online reservations.
- The reservation system will not disrupt existing business processes, as it will integrate seamlessly into the cinema's existing ticketing workflow

1.4.3 Economic Feasibility

- The implementation of a ticket reservation system will require an initial investment in software development, hardware, and staff training. However, this investment is likely to be recouped through increased ticket sales and improved efficiency.
- The reservation system will provide customers with a more convenient way to purchase tickets, which may increase ticket sales and revenue.
- The reservation system will allow the cinema to more efficiently manage ticket inventory, reducing the risk of overbooking or overselling tickets and potentially saving money on refunds or compensation for affected customers.
- The reservation system will allow the cinema to collect and analyze data on customer behavior and preferences, which can inform future business decisions and marketing strategies.

1.4.4 Political feasibility

The system to be developed is not conflict with any government directives, because it gives services for the people effectively and efficiently. This project system will avoid conflict between the workers and organizations because of both of them are beneficiaries.

1.5 Scope and limitations of the project

1.5.1 Scope of the project

The scope of project is allows users to purchase movie tickets over the internet. The system usually provides users with a user-friendly interface to browse movie show-times and available seats, select seats of their choice, and make payment securely using a variety of payment options.

The system also offers features such as seat selection, booking history, cancellation, and refunds. In addition, the system may provide users with information about the movie, including trailers, ratings, reviews, and synopsis. And Our project is highly convenient for users as they can purchase movie tickets anytime and from anywhere.

It also saves time, avoids the hassle of long queues at the cinema, and allows users to avoid sold-out movies. The system is highly scalable and can handle a large volume of users and transactions simultaneously, making it a highly efficient and reliable platform for moviegoers.

1.5.2 Limitations of the project

- Dependence on third-party payment systems: If the online reservation system relies on third-party payment systems,
- Language barriers: If the online reservation system is only available in a limited number of languages, it may limit the number of users who can access the system.
- User adoption: While an online cinema ticket reservation system may offer convenience and flexibility, some users may be resistant to using it due to a lack of trust or familiarity with the technology.

1.6 Significance of the project

The online cinema ticket reservation system is a significant project that has transformed the way moviegoers purchase their tickets. The system provides a range of benefits to both the moviegoers and the cinema industry. Firstly, it provides convenience to customers by allowing them to book tickets anytime and from anywhere using their internet-connected devices.

This eliminates the need to visit the cinema in person and saves time. Secondly, the system provides moviegoers with a user-friendly interface to select their preferred seats and choose from a variety of available show times, which enhances their movie going experience.

For cinema operators, the online cinema ticket reservation system helps streamline their operations by reducing the workload of cinema staff and minimizing errors in ticket sales.

It also provides valuable insights into customer preferences, which enables them to make data-driven decisions about scheduling and pricing.

Moreover, the online cinema ticket reservation system has transformed the cinema industry by increasing ticket sales and revenue. The system enables cinema operators to reach a wider audience by providing a platform for online ticket sales. This has led to increased revenue and growth in the cinema industry.

1.7 The beneficiaries of the system.

- The beneficiary of the online cinema ticket reservation system can be anyone who wants to watch a movie at a cinema theater. The online ticket reservation system offers a lot of benefits for movie-goers, such as:

    1. Convenience: The system allows movie-goers to book tickets from the comfort of their own homes, without having to stand in long queues at the cinema.

    2. Time-saving: With the online ticket reservation system, movie-goers can avoid wasting time waiting in line and can simply show up at the theater just in time for the movie.

    3. Choice: The online ticket reservation system offers movie-goers the ability to select their preferred seats, as well as choose from a wide range of movies and show timings.

    4. Security: The system is secure and offers peace of mind to movie-goers as they can easily purchase tickets using a variety of payment options, without having to worry about carrying cash to the theater.

1.8 Methodology

1.8.1 Data collection tools and techniques

The Method and techniques used to analyze the existing system and designing electronic system includes, interview, questionnaires and observation. Those methods which help us to gather the required data to analyze our project and those methods selected due to the time and the organization's willingness.

- **Interviewing and questionnaires**: It is the primary technique used to elicit the necessary information from the manager of Alem Cinema who takes the responsibility to manage Alem Cinema and the ticket seller. The ticket seller gives us valuable information about the overall activity they perform, concerning on how they sell the ticket and the show time of the movies.

- Here's how the manual cinema ticket reservation system could work:
  - The cinema staff member greets the customer and asks for the show-time, screen number, and number of tickets required.
  - The staff member checks the availability of seats for the requested show-time and screen number.
  - If there are enough seats available, the staff member asks for the customer's name and contact details, and proceeds to reserve the seats.
  - The staff member calculates the total cost of the tickets based on the number of adult, child, and senior tickets, and provides the customer with the total amount due.
  - The staff member accepts payment and provides the customer with the tickets.
  - The staff member thanks the customer and reminds them of the show-time and screen number.

- **Observation:** Site visiting was made to support the interview done with aim to understand the ticket reservation system. The team members have observed physically by going to the place.

  The cinema has 1 big screens, each with a seating capacity of over 400. The cinema is open from Monday to Sunday with minimum 2 show-times each day: 6:00am, 8:00pm and 5:00pm. The ticket prices are $100 for new released movies and $60.

1.8.2 System analysis and design

We will employ the OOSAD (Object Oriented System Analysis and Design) methodology during the project's system analysis and design phase. Because it is a better approach to create, oversee, and put together the things that are used in our system. Increased consistency among analysis, design and programming activities.

There are various phases to this approach, some of which include:

1.8.2.1 Object-Oriented Analysis (OOA)

The team will utilize use case modeling during this phase to simulate the operation of the system, locate and identify business objects, group objects and establish relationships among them, and lastly simulate the behavior of the objects in great detail.

1.8.2.2 Object-Oriented Design (OOD)

For the purpose of designing the sequence, activity diagrams, and modeling object interactions and behavior that support the use case scenario, our team will use the E-draw and Visio software during this phase.

The reason why we have selected OOSAD (Object Oriented System Analysis and Design) method specifically UML (Unified Modelling Language) model is because of the following advantages: -

- To enable a high degree of reusability of designs. To decrease the cost of software maintenance.
- To Reduce maintenance burden.
- To Increased consistency among analysis, design, and programming activities. Improved communication among users, analysis, design, and programming.

1.8.3 System development model

Because of the following factors, we shall employ the iterative paradigm in our project:

- Iteratively improves the iterative versions until the whole system is implemented and prepared for deployment.
- The life cycle model does not attempt to start with a full specification of requirements.

- The development is clearly measurable.
- Quickly and early in the software life cycle produces functional software.
- Less expensive and more versatile when changing requirements and scope
- Simpler to test and troubleshoot in a shorter iteration.
- Because risky components are recognized and treated during its iteration, risk management is made simpler.

1.8.4 System testing methodology

- **Unit testing**

The team started by testing the system at the class level because the designed system is in an object-oriented approach. We will test the modules using Postman to verify each module's API.

- **Integrated testing**

Postman integration testing will be used to determine whether the unit tests are functioning properly.

- **System testing**

A user who has been invited by the team will test the system when all the testing has been completed. The team thoroughly tested the system, especially at this level of testing.

1.8.5 Development tools and technology

- In this project we used the following soft wares.

Visual studio IDE for coding assistance to developers, rigorous testing that can be done inside the platform, support for team collaboration, and a variety of customization options.

1.8.5.1 Frontend technologies

Hypertext Markup language (HTML)

it is used to structure a web page and its content.

Bootstrap is an open source and free framework for developing responsive using CSS, HTML, and JS.

JavaScript

It is a programming language used for more interactive elements like drop-down menus, forms and modal windows.

Bootstrap

Bootstrap is an open source toolkit, one can customize it according to their project's requirement. Bootstrap is provided with built-in components which are used in accumulating responsive web-sites by a smart drag and drop facility. Bootstrap is widely used to design faster and simpler websites.

1.8.5.2 Backend technologies

PHP (recursive acronym for PHP: Hypertext Preprocessor) is a widely-used open source general-purpose scripting language that is especially suited for web development and can be embedded into HTML.

MySQL is an Oracle-backed open source relational database management system (RDBMS) based on Structured Query Language (SQL).

XAMPP: - It is a cross-platform web server, which helps developers to create and test their programs on a local server.

Development tools and techniques

The following are used for studying existing design and developing new system.

Unified modeling language(UML) tools

These tools have highly standardize notation and increase user involvement ,so we can describe the existing system and the new system to be developing using essential use case model, user interface, flow diagram activity diagram, deployment modeling and class type architecture for object oriented analysis phase.

Microsoft office 10 for documentation

E-DRAW MAX will be used for graphical representation of the same system concepts of the project. We also use sipping tools for images.

1.8.5.3 Deployment Environment

- **Hardware environment**

- 32/64 bit operating system.
- RAM: 2GB and above.
- HARD DISK :300 and above

- **Software environment**

- Operating system :windows10.
- Mysql server.
- Java (JDK).
- HTML for develop user interface(GUI)
- Visual studio for entire coding and editing.

1.9 Budget and Time Schedule of the Project

1.9.1 Budget Schedule of the Project

Table 1. 1 Budget Schedule

No.	Items	Quantity	Unit Price in birr
1	Removable flash disk	2	300.00
2	Desktop	1	15,000.00
3	PC	1	25,000.00
4	Paper	1 pack	500.00
5	Pencil	4	50.00
6	Transport	2	100.00
7	Printing	-	190.00
Total			41,440

1.9.2 Time Schedule of the Project

Table 1. 2 Time Schedule

Time Schedule										
Task	Starting Date	Ending Date	Nov	Dec	Jan	Mar	Feb	Apr	May	Jun
Proposal	11/15/2022	11/27/2022								
Requirement Analysis	12/01/2022	12/25/2022								
System Design	12/26/2022	01/25/2023								
Documentation Submission	01/26/2023	01/30/2023								
Implementation and Coding	02/15/2023	11/15/2023								
Testing	11/15/2023	11/15/2023								
Final Project Submission	11/15/2023	5/29/2023								

Team composition

Table 1. 3 Team composition

Title	Online cinema and ticket reservation for Alem cinema			
Prepared by	No	Name	Id number	Phone number
	1	Abdulwehab heiredin	NSR/0031/12	0961426640
	2	Ashenafi faraja	NSR/0206/12	0969255803
	3	Leul zeleke	NSR/0907/12	0933390962

1.9.4 Document Organization

The proposed system document will contain the following chapter each chapter will describe it in the following manner:

Chapter one:

describe the introduction of the existing system, the problem of the existing system, objective (general and specific objective) ,scope, significance ,benefit, Limitation , schedule , Budget of the Project and methodology we followed during data collection and analysis.

Chapter two:

describe what the existing system looks like in detailed way (who uses the existing system with major function, business rule and drawback of the existing system).

Chapter three:

functional requirements, and non-functional requirements of proposed system

Chapter four:

discussed about use case model, object model and dynamic models of proposed system.

Chapter five:

design goals, current and proposed software architecture, Hardware/software mapping, Persistent data management and Access control and security.

Chapter six:

In this chapter, we will discuss about implementation of database, detailed class diagram, application server, application security.

CHAPTER TWO

DESCRIPTION OF THE EXISTING SYSTEM

2.1 Introduction of Existing System

This chapter deals with analyzing the general work flow of the existing system, players in the existing system. It produces a broad outline of the proposed system that identifies the function to be performed and the technical aspect that the system must fulfill and briefly describes the existing system functionality, problem of the existing system. It also deals the functional and non-functional requirements of the proposed system.

It is necessary to know the existing system of a given organization to develop a better system. The target area of this online cinema ticket reservation system currently performs different activities includes registering new users of the cinema, reservation, maintain and update records, prepare predict report and then like.

2.2 Description of existing system

In the existing system, the customer can see the released movies and time schedules of the movies online. You can give comments on movies on the website but the major problem is ticket reservation. In that process, the Customer has to visit cinema hall for booking seats. Further they do not even have the information about the Movie which is in the cinema hall, it's show time and different rates of the ticket. Even the customer may not be able to get information about different cinema hall available in the city. So, if he/she wishes to see a Movie on a particular day he/she has to first travel around the city to find out where it is being shown at the specific time.

In existing system people need to go to the cinemas counter on their own to reserve a movie ticket. This conventional method is available at all cinemas around the world. But there are some disadvantages. At a peak time, there can be seen too many people standing in a long queues to buy movie ticket. This will make people tired while they need to stand in long times just to buy movie ticket. It is just wasting times and become frustrated.

Further cinema hall owner has to hire large number of staff at the counter for selling tickets. Hence this system is much boring and not much user friendly.

2.3 Player (Users) of the existing system

Player represents anything or anyone participates in the system. This may include people, external system, and other organization. In the existing ticket reservation system there are different players namely customers, manager, ticket seller, seat shower security guard and Electronic technician the above-mentioned players are discussing below:

- **Customers: -** are peoples they want to see movies.
- **Administrator: -**A cinema administrator will be a team leader, a business planner, a human resources officer and a marketing executive all rolled into one. Responsibilities will include Promoting films, Training staff and Dealing with problems as and when they arise.
- **Ticket seller: -** is a person who sells tickets for customers.
- **Ticket receiver: -**Sometimes people try to enter a cinema without paying for their seats. Ticket receiver who has difficulty preventing these people or other troublemakers from entering the cinema may call a security guard or the theater manager for assistance.
- **Seat shower: -**is persons work in movie cinema. They provide a safe environment for all guests and direct them to seats, restrooms and refreshment areas.
- **Security guard: -** is a person who protects the cine ma hall.
- **Electronic technician: -**Technicians are responsible for installing and calibrating sound and lighting systems. Stage lights must be installed, focused properly, and tested before a performance.

2.3 The existing organizational structure of ALEMCINEMA

The current system performs the work flow from the top level cinema manager to the lower level ticket seller person. The manager can obtain films from directors and negotiate with them. The ticket seller sits in the door and sells tickets to customers, while the ticket receiver receives tickets from customers and directs them to the proper seat.

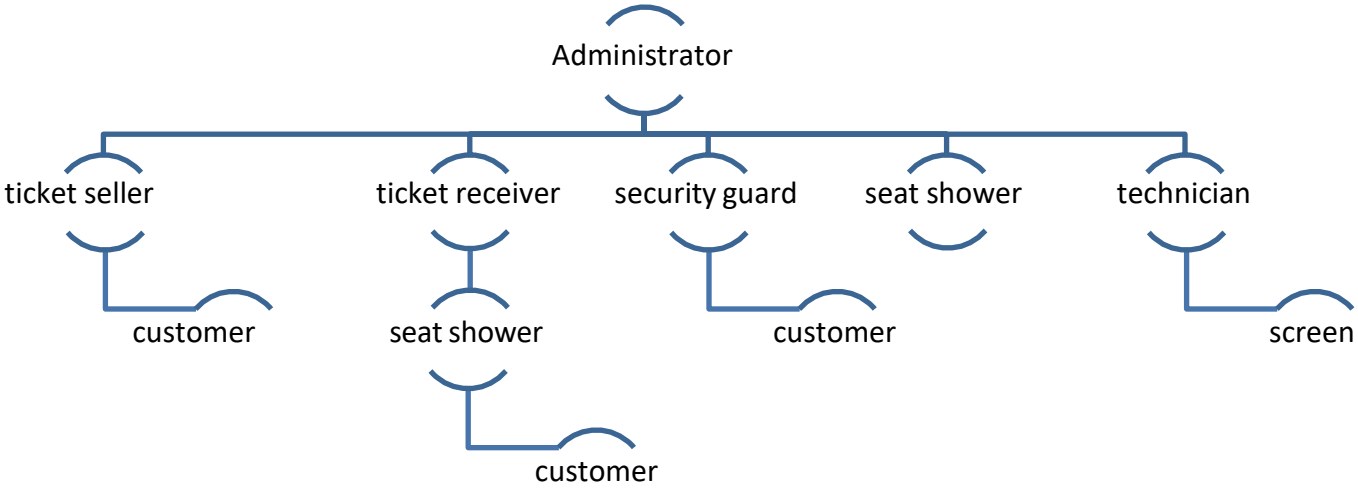


Figure 2 1 The existing organizational structure of ALEM CINEMA

2.4 Major Functions of the Existing System

. The current website system of Alem Cinemas provides movie information such as the length of the film and the names of its writers and producers. It also provides a commenting platform for viewers to share their thoughts on the movies. The current website provides a weekly list of available movies. This website also includes advertisements for other organizations and news about other movies.

In general, the Alem cinema website does not offer a ticket reservation system.

2.5 Drawbacks of the existing system

The existing system actually faces to a lot of problems, and these problems results due to the manual system of accomplishing its operations. Such as:

- **Ticket Reservation: -**In the cinema hall, there can be seen too many people standing in a long queues to buy movie ticket. This will make people tired while they need to stand in long times just to buy movie ticket. It is just wasting times and become unsatisfied.
- **Report generation: -**The cinema hall head generates report on weekly or monthly. The cinema hall condense general information about the activates that are performed within the members. This is difficult to integrate various information's to generate the report.
- **Storage: -**Since all records such as movies kept physically on shelves so the cinema hall record keeping system is poor and subjects to number of problem such as:

- There is no means of keeping backup
- Space: there are a lot of movies that are shown by customers and they need a room to store and causes difficult to search them from it at later use.
- There is also loose of physical recordings through times

- **Information related problems: -**because of the cinema use manual system the customers cannot easily acquire information about which movies are shown and the schedule**.** This means it is difficult to distribute the information to the customers.
- **Market related problems: -**most of the customers are local because of the system is not web based. Due to the manual system customers are limited with in locality.
- **Efficiency**- due to the manual operation most of the activities are prone to wastage of resources like man power, time etc. to produce the corresponding outputs. This makes the existing system inefficient while utilizing resources.

2.6 Business Rules in the Existing System

A business rule is effectively an operating principle or polices that we try to specify for both the existing system and the new system must satisfy. The business rule is a principle or a policy in which the proposed system operates accordingly. It deals with access control issues.

It often relates to access control issues, operating policies and principles of the organization. The organization has the following principles in the existing system which includes:

- **BR1 -** The management reserves the right to refuse entry.
- **BR2 -** Reserved Tickets not be return after selling if the time limit has reached.
- **BR3** - There is a no smoking in a cinema hall.
- **BR4 -** Entry and re-entry are checked by employees by checking either they are reserve ticket or not.
- **BR5 -** Food and drink not allowed in a cinema hall.
- **BR6 -** Shouting and disturbing others not allowed.
- **BR7** - Verbal and/or physical aggression towards staff will result in refusal of entry or requirement to leave.
- **BR8 -** Children must be accompanied by a responsible adult at all times.

CHAPTER THREE

THE PROPOSED SYSTEM

3.1 INTRODUCTION

The proposed system is a web based application where one can buy tickets with just one click go. An internet user can buy tickets at any time of day or night. He will be guided with all the necessary steps to book tickets and collect tickets at the ticket counter in the website.

In order to overcome the existing problem, we are making this system as online where every customer to get better facilities at his own computer or laptop.

3.2 Functional requirement

Functional requirements define the fundamental actions that system must perform. Functional requirement describes functionality or system services

- **Customer**

Req1. The system shall give application form for required information.

Req2. The system shall show movie news.

Req3. The system shall show movie schedule.

Req4. The system shall show movie information and preview.

Req5. The system shall show free seats.

Req6. The system shall provide the customer online payment methods.

Req7. The system shall give application form for reserving seats.

Req8. The system shall allow users to cancel already reserved seats.

Req9. The system shall enable customer or visitor to view list of movies.

➢ Theatre

Req1.The system shall require login before allowing any functions for the staff.

Req2. The system shall allow the theatre to update his or her account.

Req3.The system shall allow the theatre to add movie schedule.

Req4. The system shall allow the theatre to see seat information.

Req5. The system shall allow the theatre to search movies schedule from the list.

Req6. The system shall allow the theatre to add, update and delete movies.

Req7. The system shall allow the theatre to manage payment.

Req8. The system shall allow the theatre to add show

Req9. The system shall allow the theatre to view show

➢ Admin

Req1. The system shall allow the admin to login.

Req2. The system shall allow the admin to add theatre.

Req3. The system shall allow the admin to delete theatre.

Req4. The system shall allow the admin to add upcoming movies

Req5. The system shall allow the admin to logout.

➢ Ticket Checker

Req1. The system shall allow the Ticket Checker to check ticket

3.3. Non-functional Requirements

The non-functional requirement of the system deals with how well the system provides service to the user. The non-functional requirements of the new system that we proposed are those requirements that are not readily captured in the use case.

3.3.1. User Interface and Human Factors

The user interface of the system shall be interactive, users friendly, and easy to learn and not confuse users. Anyone can access the website on the desktop or laptop computer.

3.3.2. Hardware Consideration

The system shall work on all devices with an updated browser. The system should interact with a server, so the server should have supported enough storage.

3.3.3. Security Issues

Security concerns should be addressed through the implementation of security policies such as the use of user login credentials and access restrictions (policies).

- The system is secured. i. e. user must be able to give rights or deny for all users based on his/her position by the administrator of the system.
- Use different algorithm to encrypt the password.
- The password is strong (8) character string.
- All major operations/transactions done on the system should be logged to the central database that means all of the users have their own login page.
- Any change in the structure of the database is shall done by administrator.

3.3.4. Performance Consideration

Since the system will be accessed by users (admins, service providers and service seekers), it shall be optimized to ensure a reasonable amount response time and throughput while handling and processing queries quickly.

1. **Response Time**- Upon request for user inquiry the system under normal condition should display results as quickly as possible.

2. **Processing Time**- Since the system is developing with efficient programming language and database upon request for user's Activities the system under normal condition should `process the request as quickly as possible by using multi-tier architectures.

3. **Concurrent** - Processing the system can support multiple users at a time.

Efficiency:

- ✓ The system gives appropriate output based on the expected lists of inputs.
- ✓ The system must ensure allocation and use of services being requested for the users by using minimum memory storage, cost, time and human power.

Accuracy:

- ✓ Proposed system will be better due to reduction of error. All operation can be done correctly and it ensures that whatever information is coming from the data base is accurate.

3.3.5. Error Handling and Validation

Accidental threat like improper data input, destruction of data during processing shall be controlled by the system.

- **Incorrect input**: the system handles many exceptions like inserting empty string to the database, filing the form with incorrect value, and inserting a duplicated Email and display an appropriate message for each error.
- **Login error**: the system shall handle an attempt to login with incorrect username and password and display appropriate message.

3.3.6. Quality Issues

The system should be available 24 hours a day and 7 days a week unless internet connection is week. The system shall allow users to comment and send bug reports to the development team in order to improve the system

- **Reliability**: the system should not fail if there is access of internet.
- **Usability**: the system that we developed to learn and operate. It will need only little training to use the system.
- **Availability**: the system will available for all working day

3.3.7. Backup and Recovery

When team member standard to develop a system they must have to put use a backup mechanism by using cloud storage and removable flash disks.

3.3.8. Physical Environment

The system deploys in a server computer that supports the window operating system and the client computers access it from the server and can use it. In the physical environmental factors, to protect the server from overheat and other natural disasters like rain, the server should keep in well-equipped and ventilated rooms for better protection.

3.3.9. Resource Issues

The systems need a laptop or desktop and a web browser on this device in order to work.

The resource that help for our system (our system consume) are internet, computer or electronic internet based device and electric light to functionalize or to give service this resources are must be needed.

3.3.10. Documentation

Each phase including the proposal, Requirements Analysis Document and System Design Document shall be documented with version number, which is stored GIT hub for the purpose of participating future references.

CHAPTER FOUR

SYSTEM ANALYSIS

4.1 Introduction

The analysis of an information system produces the details that clearly describe how a system will meet the requirements identified during earlier steps. Model is an abstraction of the real world. It allows us to deal with the complexity current in a real-world problem by focusing on the essential and interesting features of an application. The techniques and associated notation used for object oriented analysis and design in incorporated in to a standard object – oriented language called unify Modeling language (UML).

An important goal of requirement modeling is come to an understanding of the useless problem that the new system is to address. This chapter focuses on developing the requirement and analysis models for the new system using the UML use case model, sequence diagram, activity diagram and class diagram.

4.2 Use case Model

Use case classes are used to model and represent units of functionality or services provided by a system (or parts of a system: subsystems or classes) to users. It captures the goal of the users and the responsibility the system to its users. It is the functionality of the system or the service provided by the system. Based on the analysis made the following use cases are identified.

A use case is a sequence of action that provides a measurable value to an actor another way to look at it is that a use case describes a way to which a real world to interacts with the system. An essential use case sometimes called a business the case is simplified, abstract, generalized use case that captures the intention of the user in a technology and implementation independent manner.

- ✓ **A use case**: describes a sequence of action that provides a measurable value to an actor and draw as a horizontal ellipse.
- ✓ **An actor:** is a person, organization, or external system that plays a role in one or more interactions with the system and draw as stickman figure.

- ✓ **System boundary**: indicates the scope of the system project. Anything within the box represent functionalities in side in scope.

Relationship between actors and use cases exists whenever an actor is involved with an interaction described by a use case and modeled as a line connecting use cases and actors.

4.2.1 Actor Identification

Actor classes are used to model and represent roles for "users" of a system, including human users and other systems. Based on this we identify the following user of our system:

- ➢ Administrator
- ➢ Theatre
- ➢ customer
- ➢ Ticket Checker

4.2.2 Use case Diagram

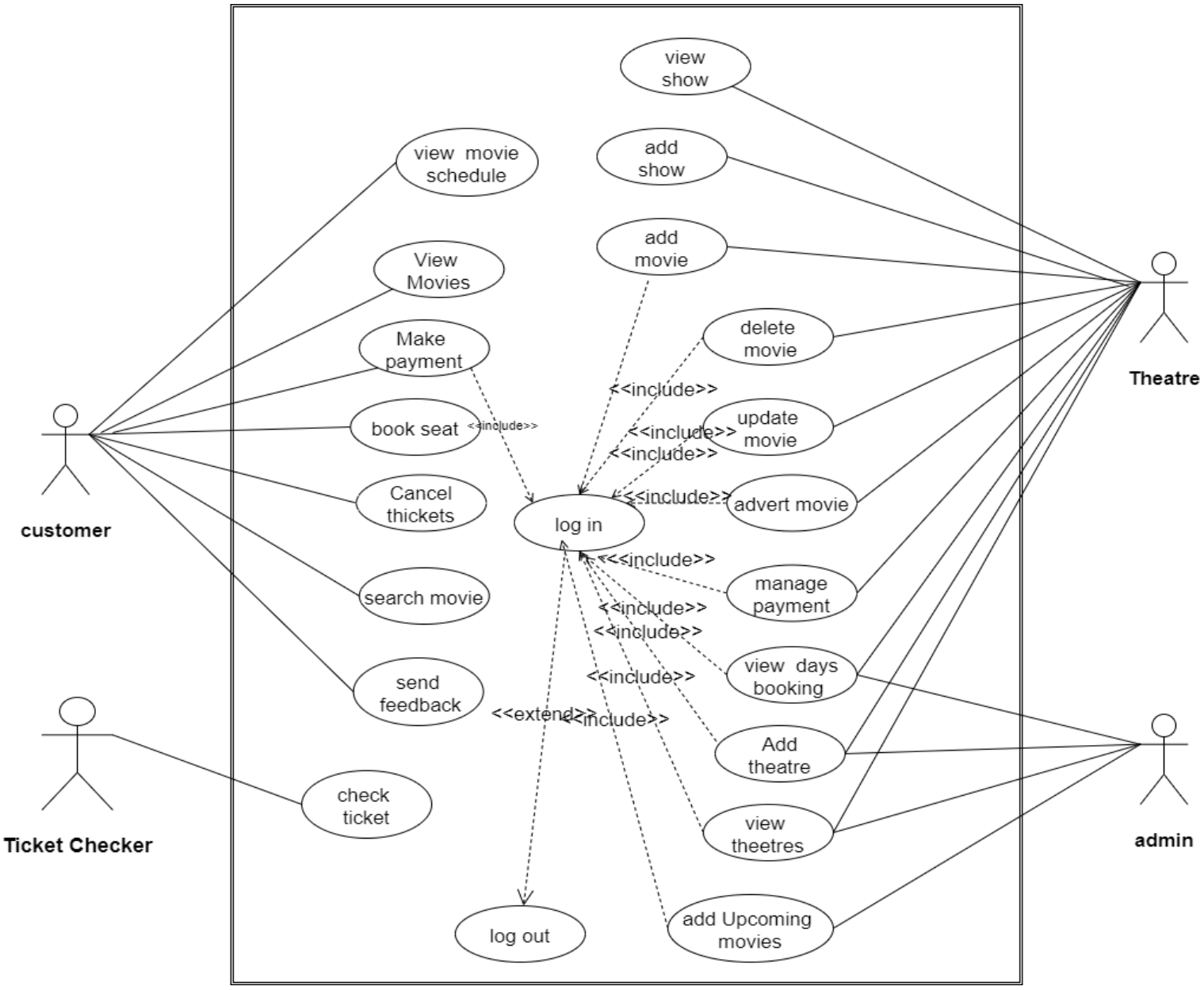


Figure 4. 1 use case diagram for online Alem Cinema Thicket Reservation system

4.2.3 Use case description

Table 4. 1 Use Case Description of login

Use case name:	**Login**	
Use case id	Uc01	
Actor	theatre, Admin, customer, ticket checker	
Description	The system allow the theatre, Admin, customer, ticket checker to login to the system	
Pre-condition	theatre, Admin, ticket checker must have user name and password to login	
Basic flow	User action	System response
	1.the theatre and Admin click loginbutton 3. The theatre and Admin enter his/her username and password 4.Then click login button	2. The system display login form 5. The system validates the entered information and display main page
Post condition:	theatre and users access their own pages.	
Alternatives Flows:	If the theatre enters invalid user name or password	
	5.2 theatre and Admin re-enter thecorrect information	5.1 the system displays try again error message

Table 4. 2 Use Case Description of schedule

Use case name	View movie schedule	
Use case id	Uc02	
Actor	Customer, theatre, administrator	
Description	The system allow the customers to see movie schedule	
Pre-condition	The customer should visit the site	
Basic flow	User action	System response
	1.Click the movies schedule link 3.the user visit the movie schedule	2.the system will display movie schedule.
Post condition	The movie schedule will be visited by customers	
Alternative flow	If the user nothing found movie schedule	
	6.1 customers should click movie schedule	

Table 4. 3 Use Case Description of book seat

Use case name	Book seat	
Use case id	Uc03	
Actor	Customer	
Description	The customer to fill necessary information required to the system	
Pre-condition		
Basic flow	User action	System response
	1.for reserving ticket user will click the "book now" button 3.the user clicks the "check available seat" button 5.the user fill the required information and clicks "payment" button 7.the user enters valid card number and clicks "confirm payment" button	2. the system will display movie information 4.the system checks the validity and availability of seats 6.the system will display ticket information and available payment methods 8. the system confirms the payment and displays the seat ticket information
Post condition	After collecting information from user, this users seat should be reserved	
Alternative flow	If the users enters invalid information or if the seat is reserved	
	6.1. go back to basic flow 1	6.2the system gives error message

Table 4. 4 Use Case Description of View seat information

Use case name	View seat information	
Use case id	Uc04	
Actor	theatre, Customer	
Description	The system allow to view the reserved seat	
Precondition	The user must first log in to the system	
Basic flow	User action	System response
	1. Click “view seat” button	2. the system displays the reserved seat information
Post condition	The available seat is viewed by staff	

Table 4. 5 Use Case Description of add movies

Use case name:	Add movies	
Use case id	Uc05	
Actor	Staff	
Description	The system enables movie updates for the theatre.	
Precondition	The theatre must login to the page	
Basic flow	User action	System response
	1.Click manage movies link 3.the staff click “update” button 5.The staff updates movie information and click “update” button 8.End use case	2.the system display the update movie button 4. The system makes the movie info available to be edited. 6. Verifies submitted data and notifies staff that the movie information has been successfully changed.
Post condition:	The movie list will be updated up to date	
Alternatives Flows:	If the staff enters invalid information	
	6.2 Staff re-enter the correct information again	6.1The system display error message

Table 4. 6 Use Case Description of delete movies

Use case name:	delete movies	
Use case id	Uc06	
Actor	Staff	
Description	The system enables theatre to remove movies	
Precondition	The theatre must login to the admin page	
Basic flow	User action	System response
	1.Click manage movies link 3.the staff click “delete” button 5.End use case	2.the system display the previously added movies 4. the system deletes the movie list
Post condition:	The movie list will be deleted from the list	

Table 4. 7 Use Case Description of UC update movies

Use case name:	update movies	
Use case id	Uc07	
Actor	theatre	
Description	The system enables theatre to update movies	
Precondition	The theatre must login to the admin page	
Basic flow	User action	System response
	1.Click manage movies link 3.the staff click “update” button 5.End use case	2.the system display the previously added movies 4. the system updates the movie list
Post condition:	The movie list will be deleted from the list	
Alternatives Flows:	If the staff enters invalid information	
	6.2 Staff re-enter the correct information again	6.1The system display error message

Table 4. 8 Use Case Description of UC Advert movie

Use case name	Advert movie	
Use case id	Uc08	
Actor	Theatre	
Description	The system allows the theatre to advert available movie	
Precondition	The theatre must be authorized to advert movie	
Basic flow	User action	System response
	1.Click advertisement link 3.the Marketing manager click “add advert” button 5. the Marketing manager insert movie and information and then click “add” button 7.End use case	2.the system display advert movie page 4.the system display advert movie form 6. The system will check the validity and display successfully message.
Post condition	The movie will be added to advertisement	
Alternative flows	If the user enters invalid information	
	6.2 go back to step 5	6.1 the system display error message

Table 4. 9 Use Case Description of view report

Use case name:	View Report	
Use case id	Uc09	
Actor	Admin	
Description	The system allow the admin to see report	
Precondition	The admin must login to the admin page	
Basic flow	User action	System response
	1.Click report link 3.the admin click report button 6.End use case	2.the system display the report page 4. the system fetches and display report 5. the system closes the report and display the main page
Post condition:	Admin view weekly and monthly reports	

Table 4. 10 Use Case Description of Manage staff

Use case name	Manage staff	
Use case id	Uc10	
Actor	Administrator	
Description	The system allow Admin to add ,deletes and change staffs password for disabling purpose	
Precondition	The administrator to login to the admin page	
Basic flow	User action	System response
	1. The admin click “Manage staff” button. 3. The admin click add, delete staff button and change the staff password 5.End use case	2. The system displays the Manage staff form 4. The system displays successful message
Post condition	Add new staff, delete staff and The staff whose password changed means staff cannot use the system	

Use case name	Manage schedule	
Use case id	Uc11	
Actor	Admin	
Description	The system allow the staffs to add, delete update movie schedule	
Pre-condition	The Admin should have user name and password and must login to the system	
Basic flow	User action	System response
	1.Click the manage movie schedule link 3.then click “manage movie schedule” button 5.click “add” ,”delete”, “update” button 7. the staff add, delete, update movie schedule 8. End use case	2.the system display manage movie schedule page 4.the system will display manage movie schedule form 6.the system will check the validity and display successful message
Post condition	The movie schedule will be added, updated and deleted to the database.	
Alternative flow	If the staff enters invalid information	
	7.2 If nothing is found go to basic flow	7.1the system gives error message

Table 4. 11 Use Case Description of Manage schedule

Use case name	Manage Payment	
Use case id	Uc13	
Actor	theatre	
Description	The system allows the manager to manage payment	
Precondition	The manager must login	
Basic flow	User action	System response
	1.the manager clicks “transactions” button 3.then the manager investigates any issues related to the payment system. 5.end of use case	2.the system display payment and transaction if exists. 4.The system validates the information and send the report to the manager.
Alternative option	If the form in not field with required data	
	6.1 system returns invalid message	

Table 4. 13 Use Case Description of Manage Payment

Use case name	Send feedback	
Use case id	Uc13	
Actor	Customer,theatre	
Description	The system allows the user to send feedback to the administrator	
Precondition	The staff must login and the customer must have e-mail address and phone number	
Basic flow	User action	System response
	1.the user clicks “contact us” button 3.the user enters his/hers feedback and send it 5.end of use case	2.the system display contact form page 4.The system validates the information and send the feedback to the admin.
Alternative option	If the ticket is not valid	
	6.1 system returns invalid message	

Table 4. 14 Use Case Description of send feedback

Use case name	Logout	
Use case id	Uc15	
Actor	Admin, Staff ,hall coordinator	
Description	The system allows the admin, staff to log out from the system	
Precondition	The staff and admin must login	
Basic flow	User action	System response
	1.the user clicks “log-out” button	2.the system loges out and display home page

Table 4. 15 Use Case Description of logout

Use case name	c	
Use case id	Uc15	
Actor	Ticket Checker	
Description	The system allows the hall coordinator to check ticket when the customer enters in to the hall .	
Precondition	Ticket Checker r must login in to the system	
Basic flow	User action	System response
	1.the Ticket Checker enters the custom-ers ticket number in to system 3. if the ticket is valid, the coordinator confirm the ticket to the customer. 4.end of the usecase	2. the system checks the validity of ticket from the database.

Table 4. 16 Use Case Description of logout

4.2.4 Class Diagram analysis level

Class Diagrams are used to represent the structure of the system in terms of objects, their notes and nature of relationship between classes. It shows the static features of the objects and do not represent any particular processing.

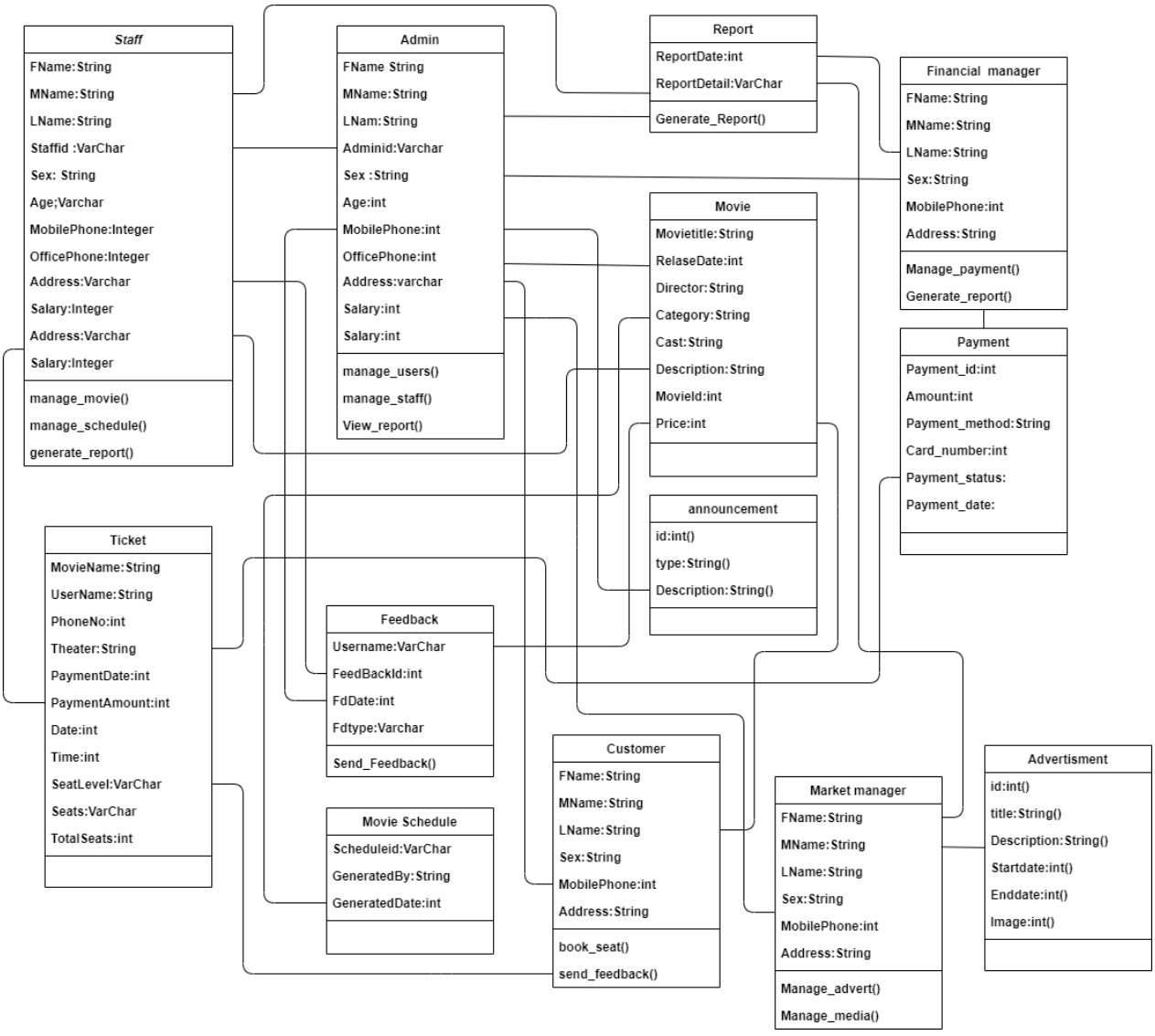


Figure 4. 1 Class Diagram

4.4.2. Data Dictionary

The data dictionary is a meta-data about the data the system is going to manipulate. Data Dictionary of the class diagram is described for each class in table to table.

Field	Type	Length	Description
First_Name	String	30	First name of customer
Last_Name	String	25	Last name of customer
Email	String	30	Email of customer
Mobile_No	String	15	Phone number of customer
Address	String	20	Address of customer
Gender	String	20	Gender of customer

Table 4. 17 Table customer personal details

Field	Type	Length	Description
First_Name	String	30	First name of staff
Last_Name	String	25	Last name of staff
Email	String	30	Email of staff
Id_photo	String	255	Id or passport or tin number photo of staff
User_Name	String	20	User name of staff
Password	String	10	Password of staff
Mobile_No	String	15	Phone number of staff
Address	String	20	Address of staff
Gender	String	20	Gender of staff

Table 4. 18Table staff personal details

Field	Type	Length	Description
User _Name	String	30	User name of the Staff
Password	Char	30	Password of staff

Table 4. 19 Table staff login details

Field	Type	Length	Description
Movie_name	String	20	The name of the movie
Released_Date	String	50	Movie release date
Director	String	20	Movie director's name
Category	String	20	Type of movie
Cast	String	100	People that participated on the movie
Description	String	200	Some detailed information of the movie
Price	int	10	The cost of the movie
Movie_id	String	10	Movie identification number

Table 4. 20 Table movie detail

Field	Type	Length	Description
Theater	String	40	The movie displaying Theater name
Payment_date	int	20	Date for the ticket
Payment_amount	int	20	Description of the project
Date	varchar	40	Date of the movie display
Time	String	30	Time of the movie start
Seat_level	Varchar	30	Level of the seat reserved
Total_seat	int	10	Numbers of seat reserved at once

Table 4. 21 Table ticket details

Field	Type	Length	Description
Movie_name	String	20	The name of the movie
Released_Date	String	50	Movie release date
Director	String	20	Movie director's name
Category	String	20	Type of movie
Cast	String	100	People that participated on the movie
Price	int	10	The cost of the movie
Movie_id	String	10	Movie identification number
Scheduleid	int	20	Identification of the schedule
Generated_by	VarChar	20	Name of the staf that scheduled the movie
GeneratedDate	int	20	Date of the schedule generated

Table 4. 22 Table movie schedule details

Field	Type	Length	Description
Feedback_id	int	20	Feedback identification
Feedback_date	int	20	Date of the feedback is submitted
First_Name	String	30	First name of customer
Last_Name	String	25	Last name of customer
Email	String	30	Email of customer
Feedback_type	String	20	Type of the feedback

Table 4. 23 Table feedback detailed information

Field	Type	Length	Description
Report_date	String	20	Date of the report submitted
Report_detail	String	30	Report's full information
First_Name	String	30	First name of staff
User_Name	String	20	User name of staff
Mobile_No	String	15	Phone number of staff
Address	String	20	Address of staff
Gender	String	20	Gender of staff

Table 4. 24 Table report details

4.2.5 Sequence Diagram

A sequence diagram is a UML interaction diagram. It represents the chronology of the passing of messages between system objects and actors. It may be used to illustrate a possible scenario of a use case, the execution of an operation, or simply an interaction scenario between classes of the system.

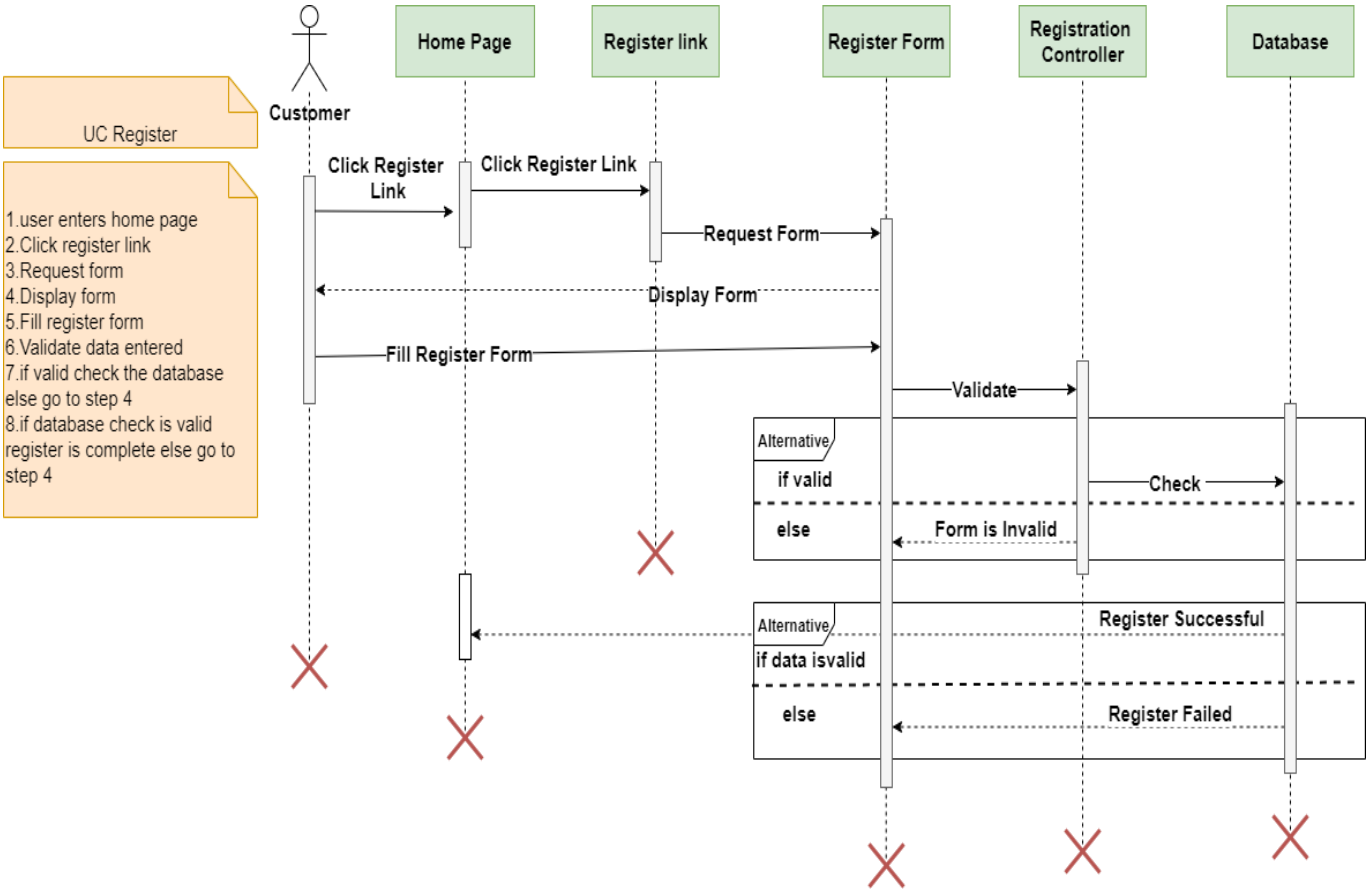


Figure 4. 2 *Register Sequence Diagram*

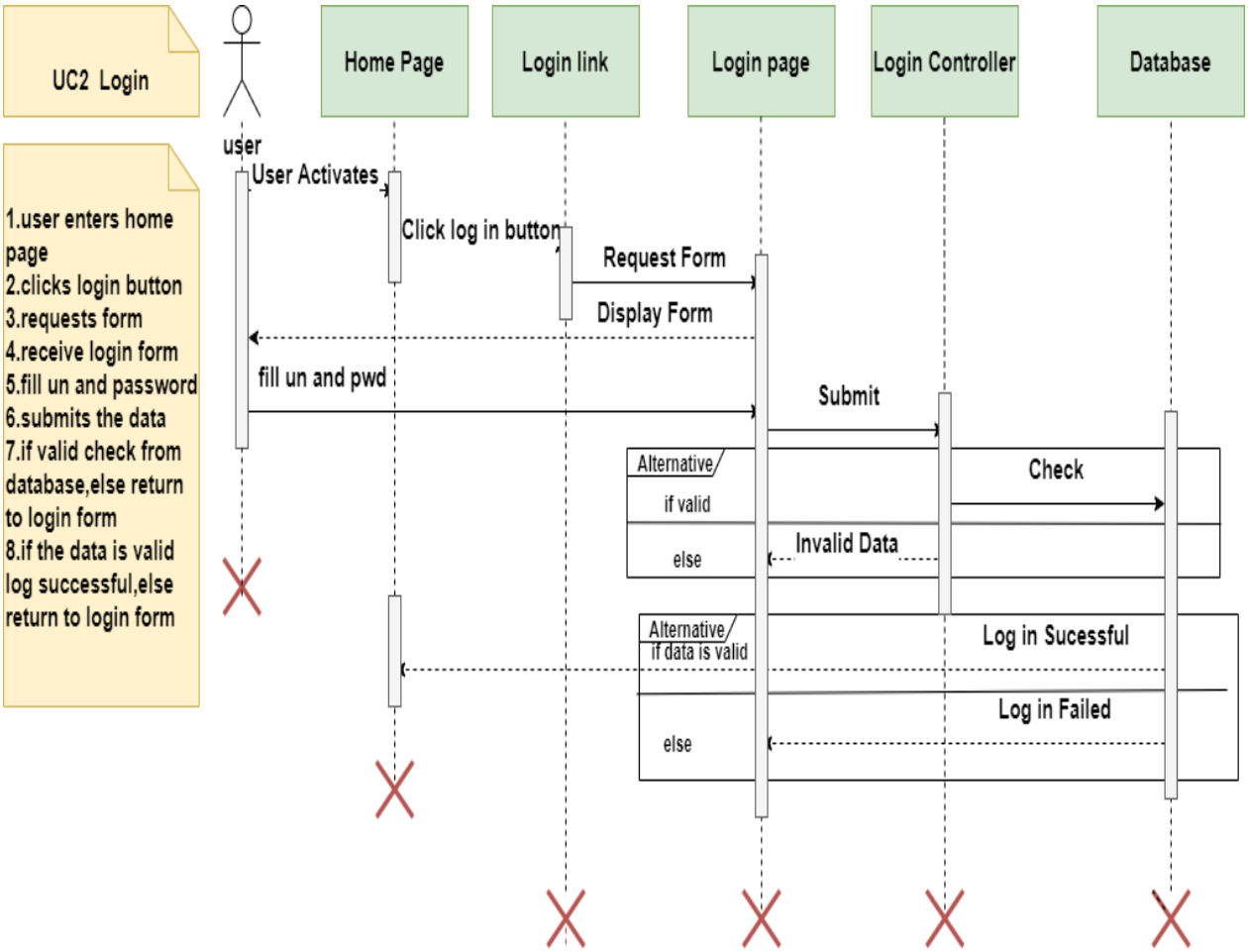


Figure 4. 3 Login sequence diagram

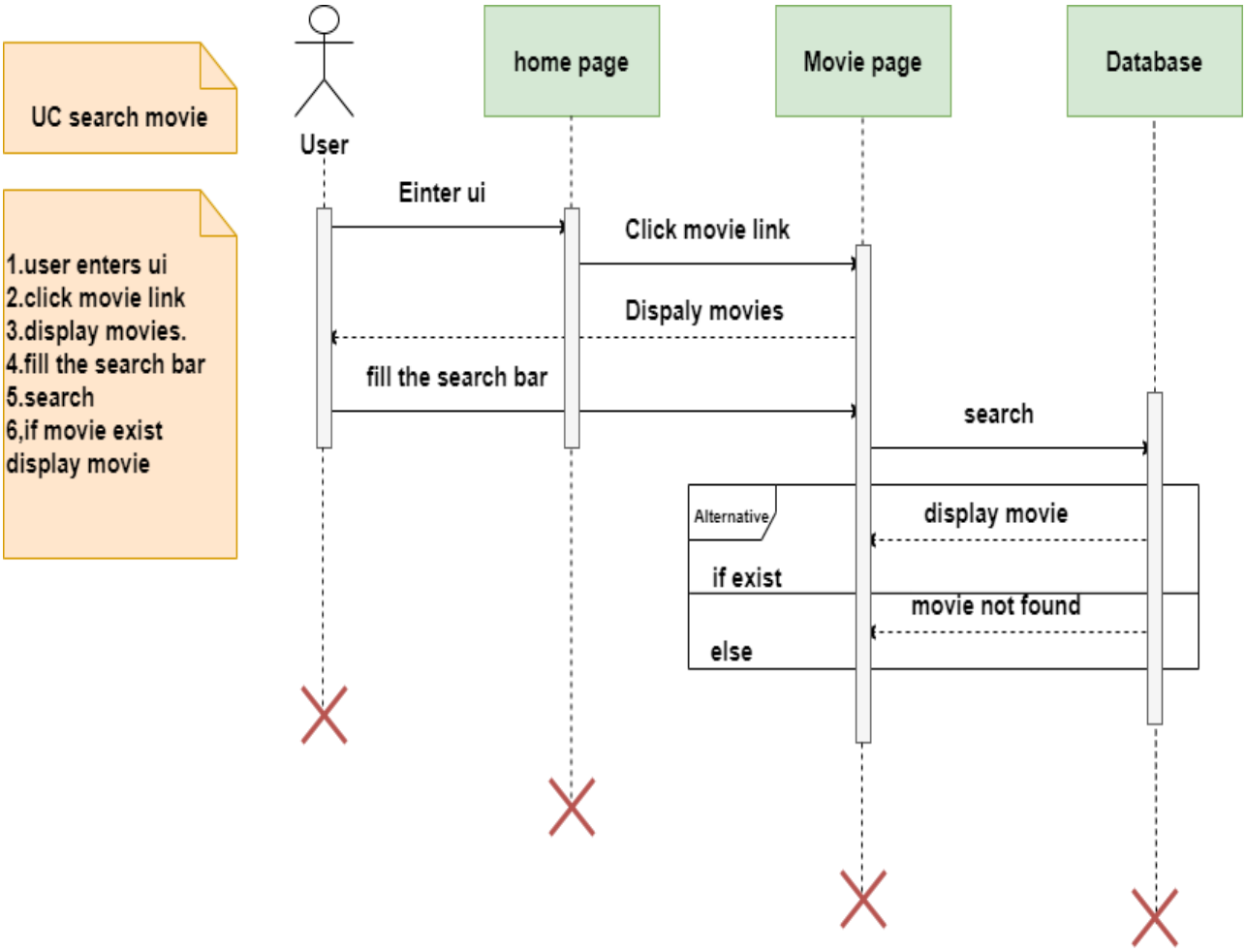


Figure 4. 4 Search Movies sequence diagram

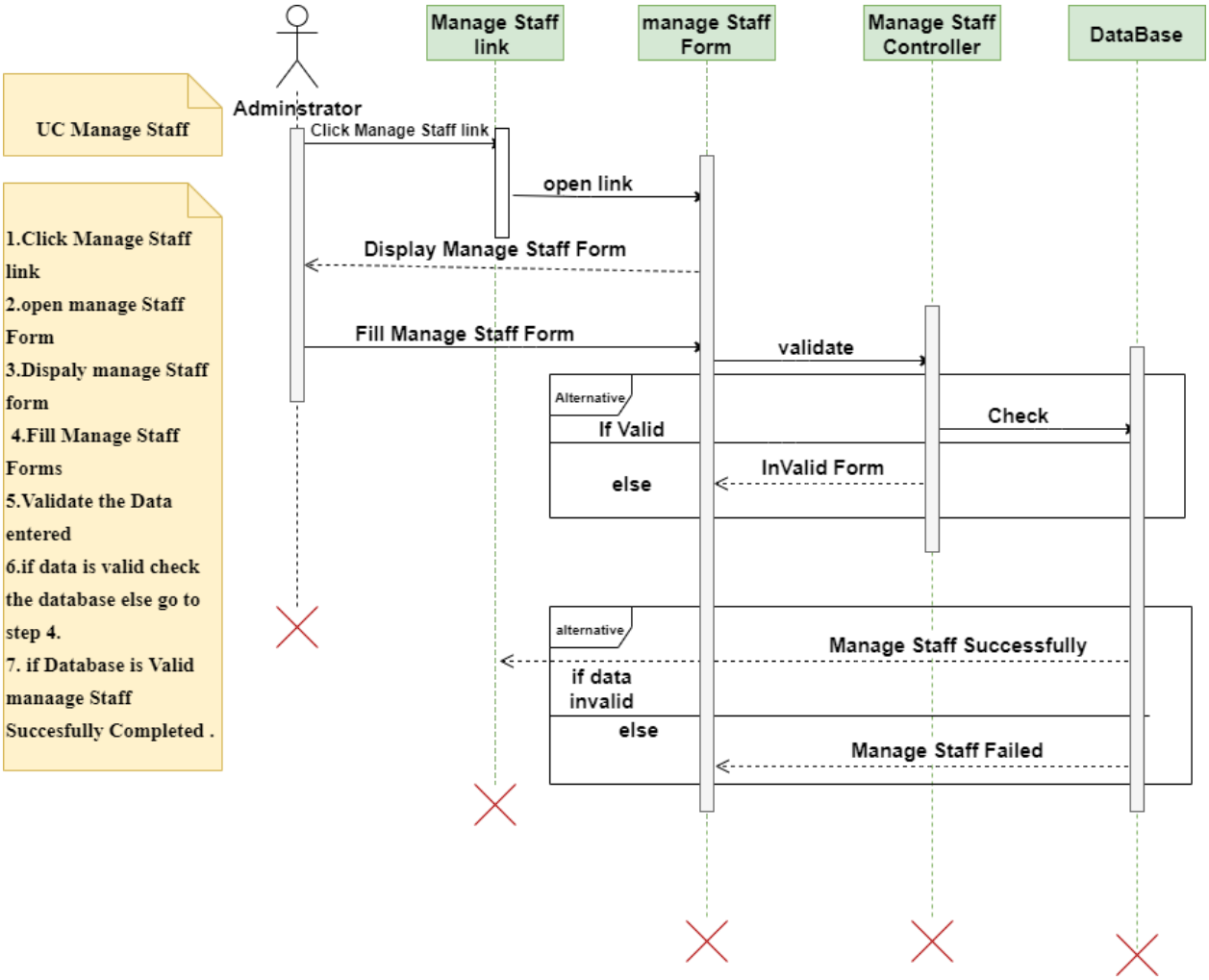


Figure 4. 5 manage theatre sequence diagram

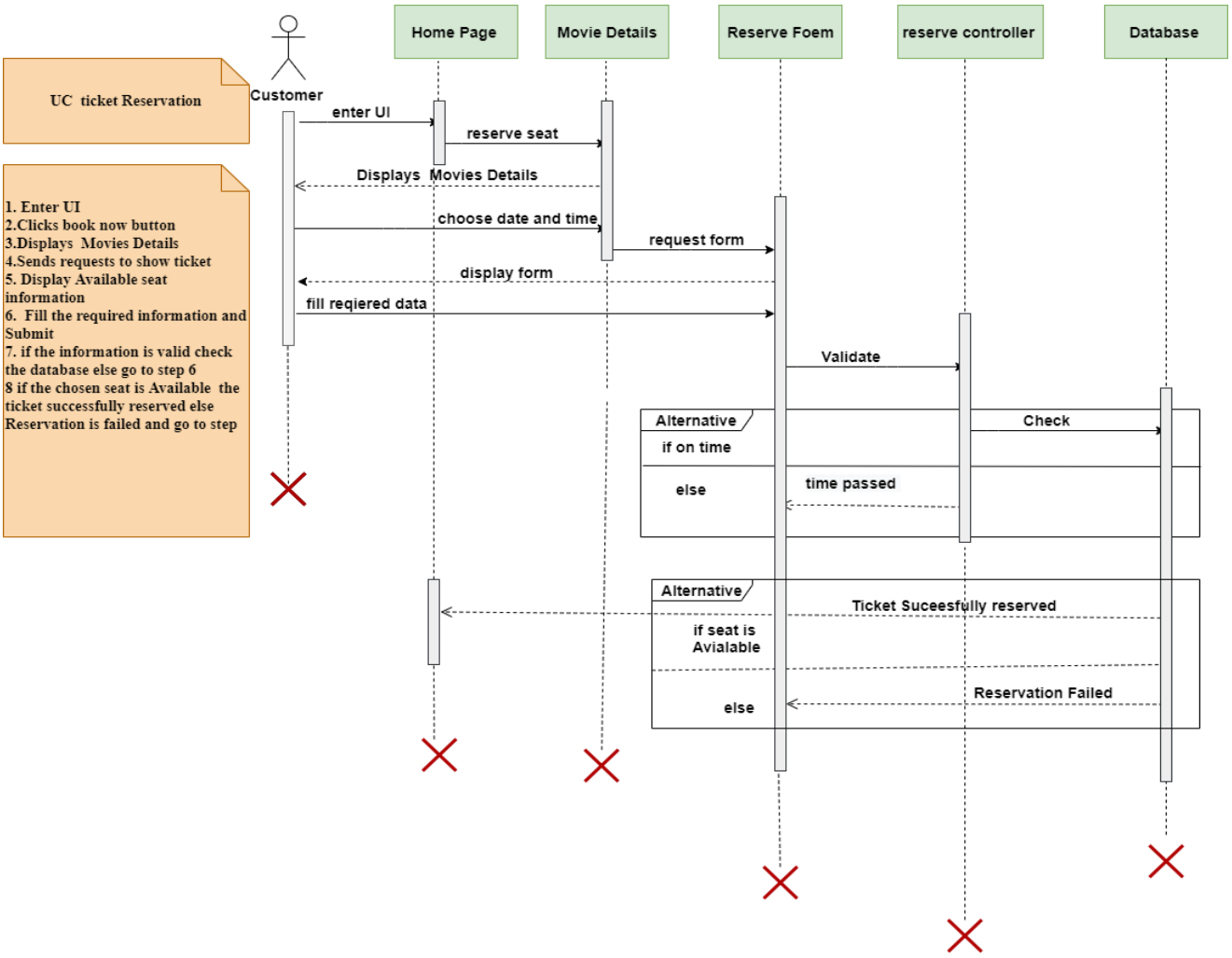


Figure 4. 6 ticket reservation sequence diagram

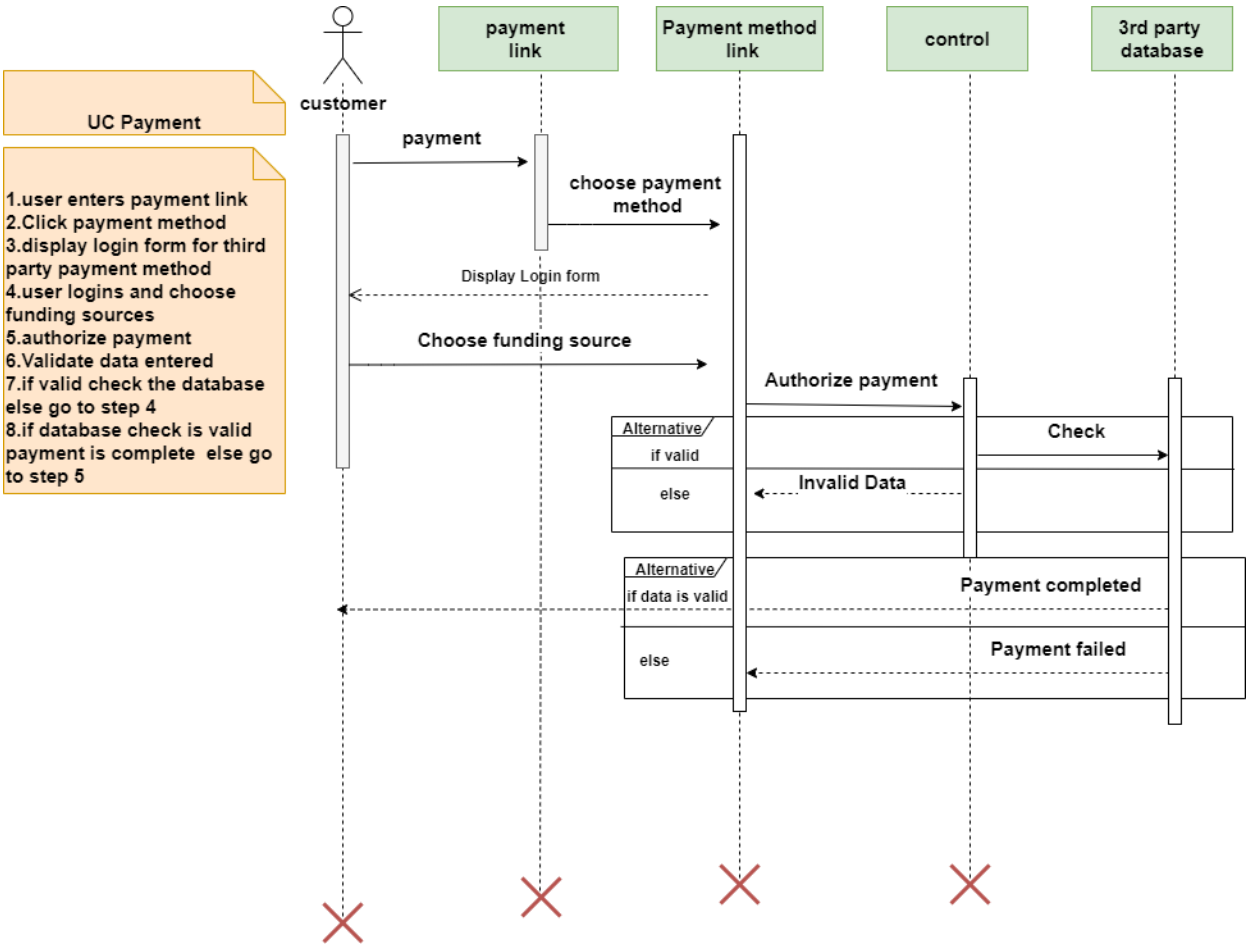


Figure 4. 7 payment sequence diagram

4.2.6 Activity Diagram

An activity diagram illustrates the dynamic nature of a system by modeling the flow of control from activity to activity. An activity represents an operation on some class in the system that results in a change in the state of the system. Typically, activity diagrams are used to model workflow or business processes and internal operation.

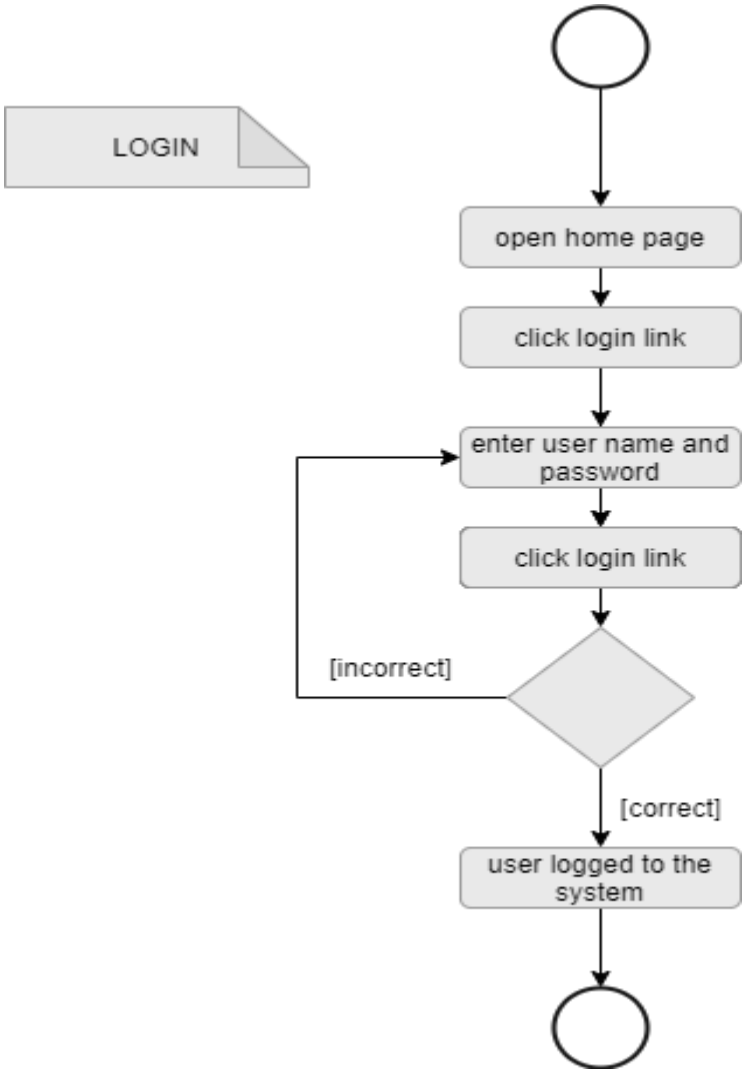


Figure 4. 8 login Activity Diagram

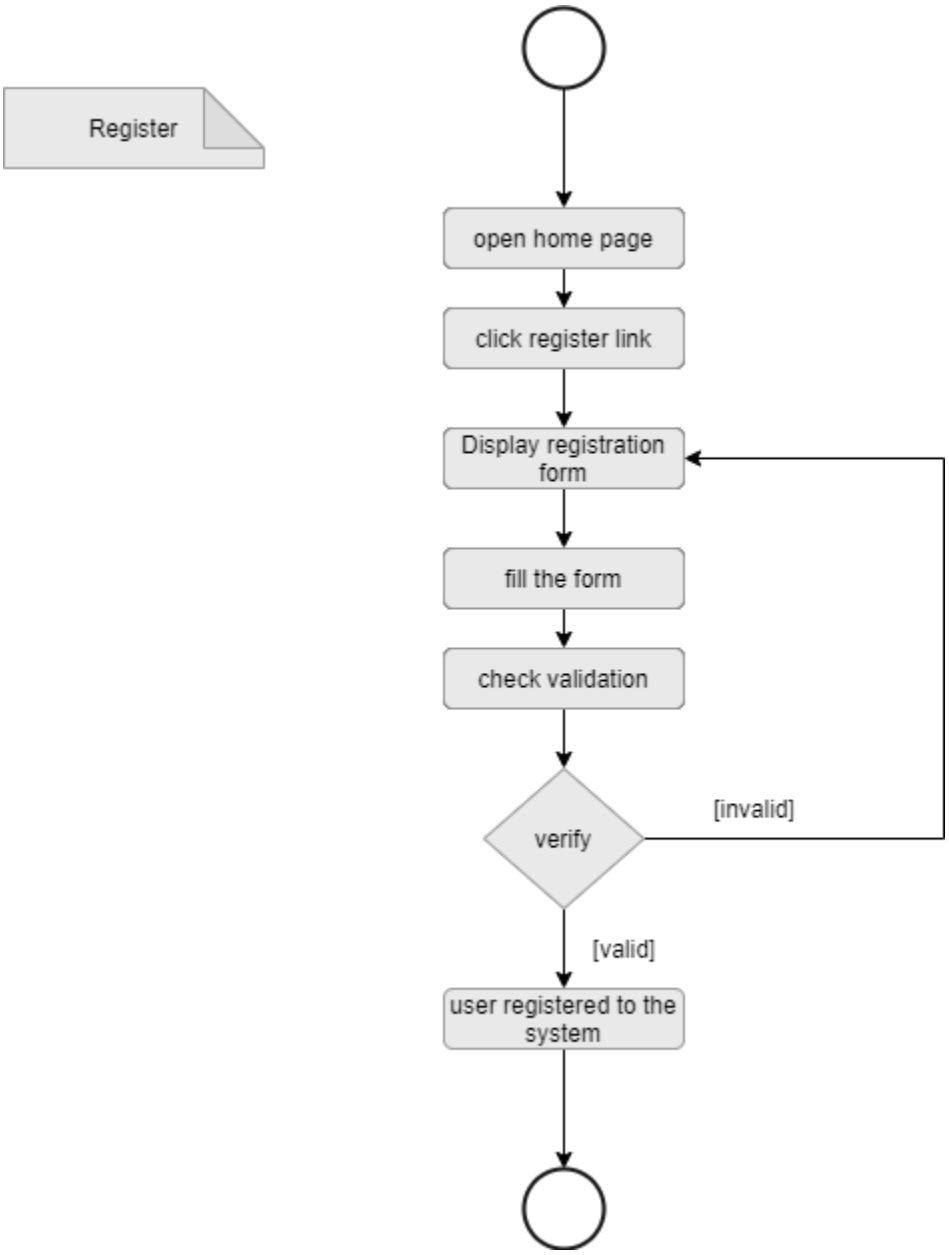


Figure 4. 9 Register Activity Diagram

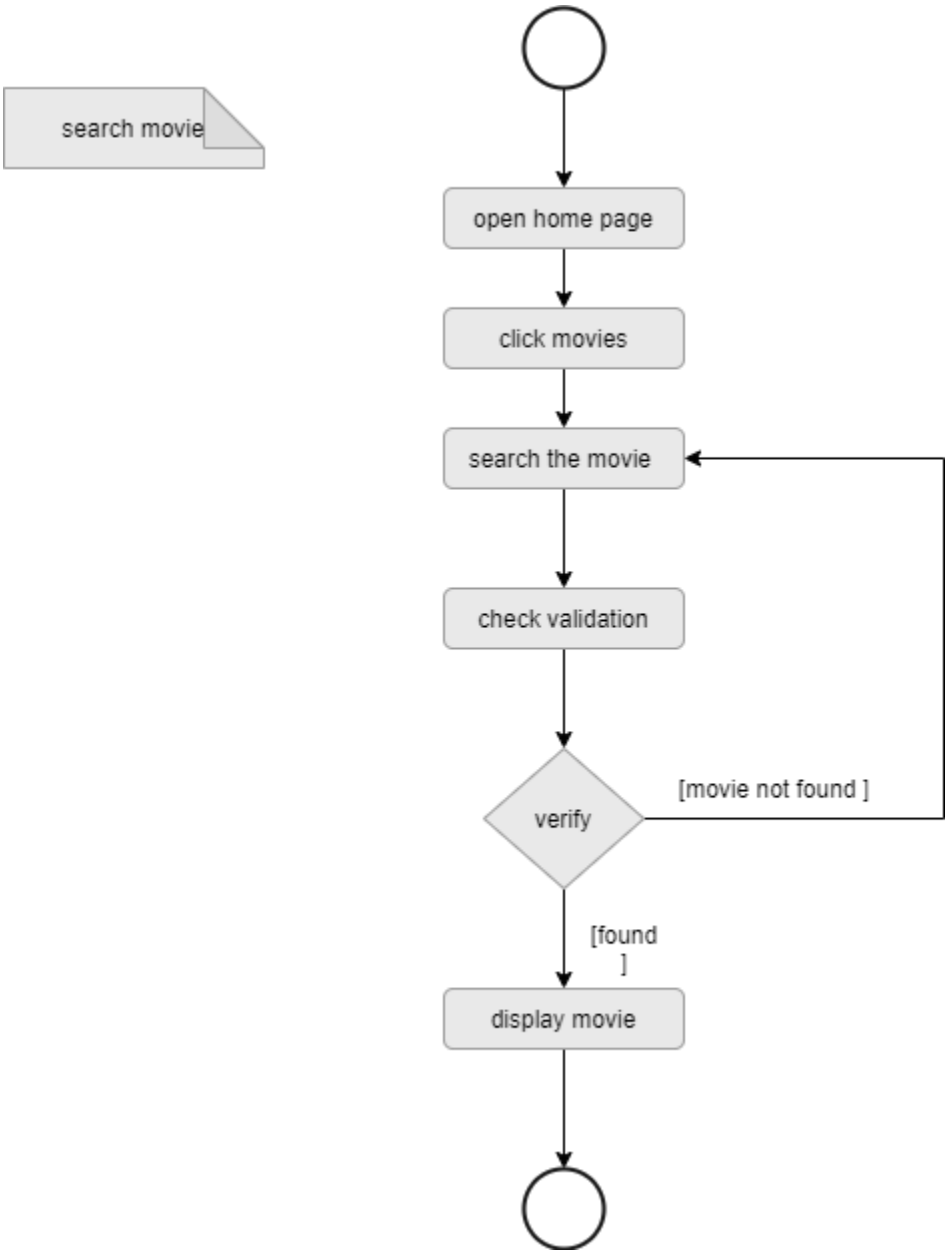


Figure 4. 10 Search movie activity diagram

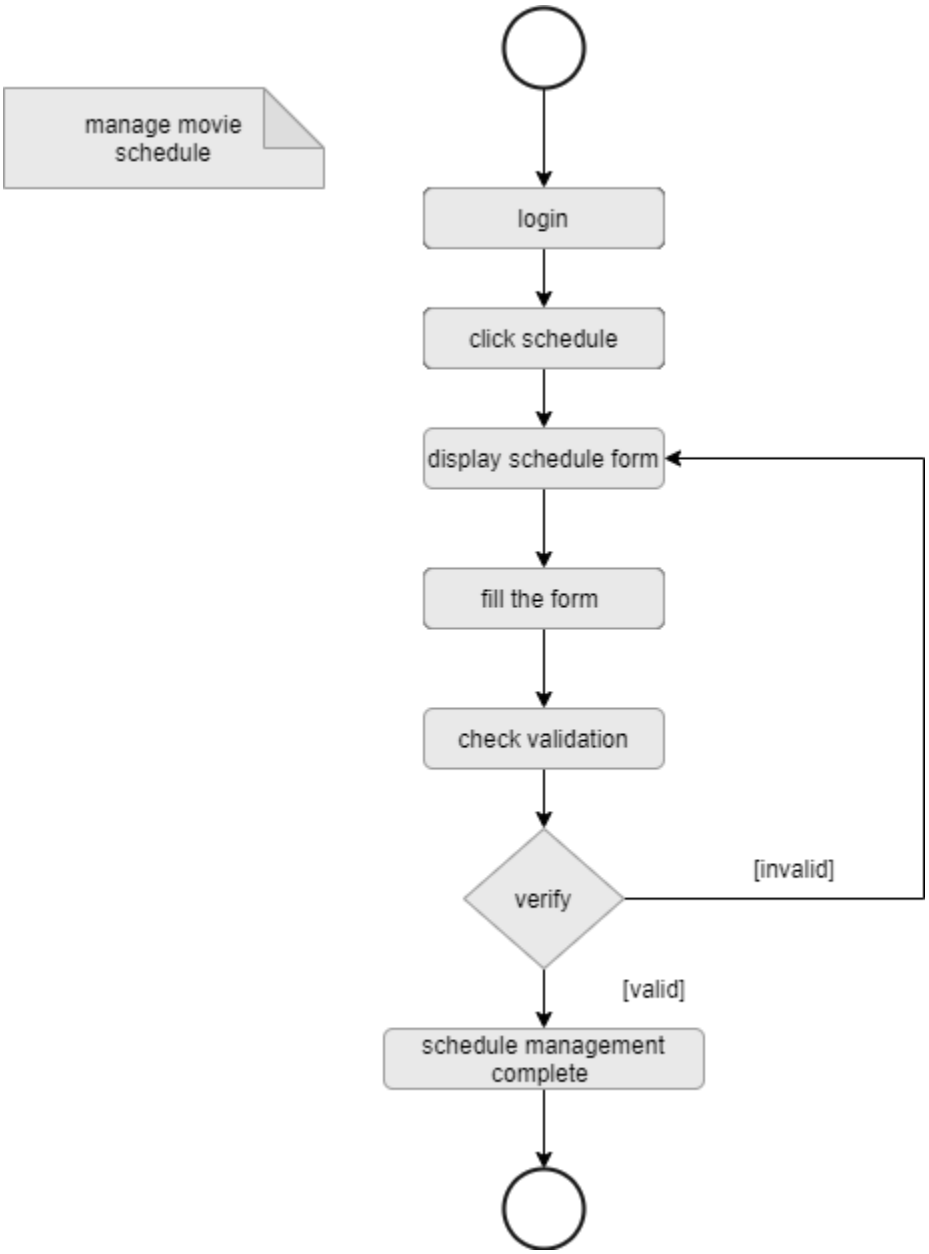


Figure 4. 11 Manage movie activity diagram

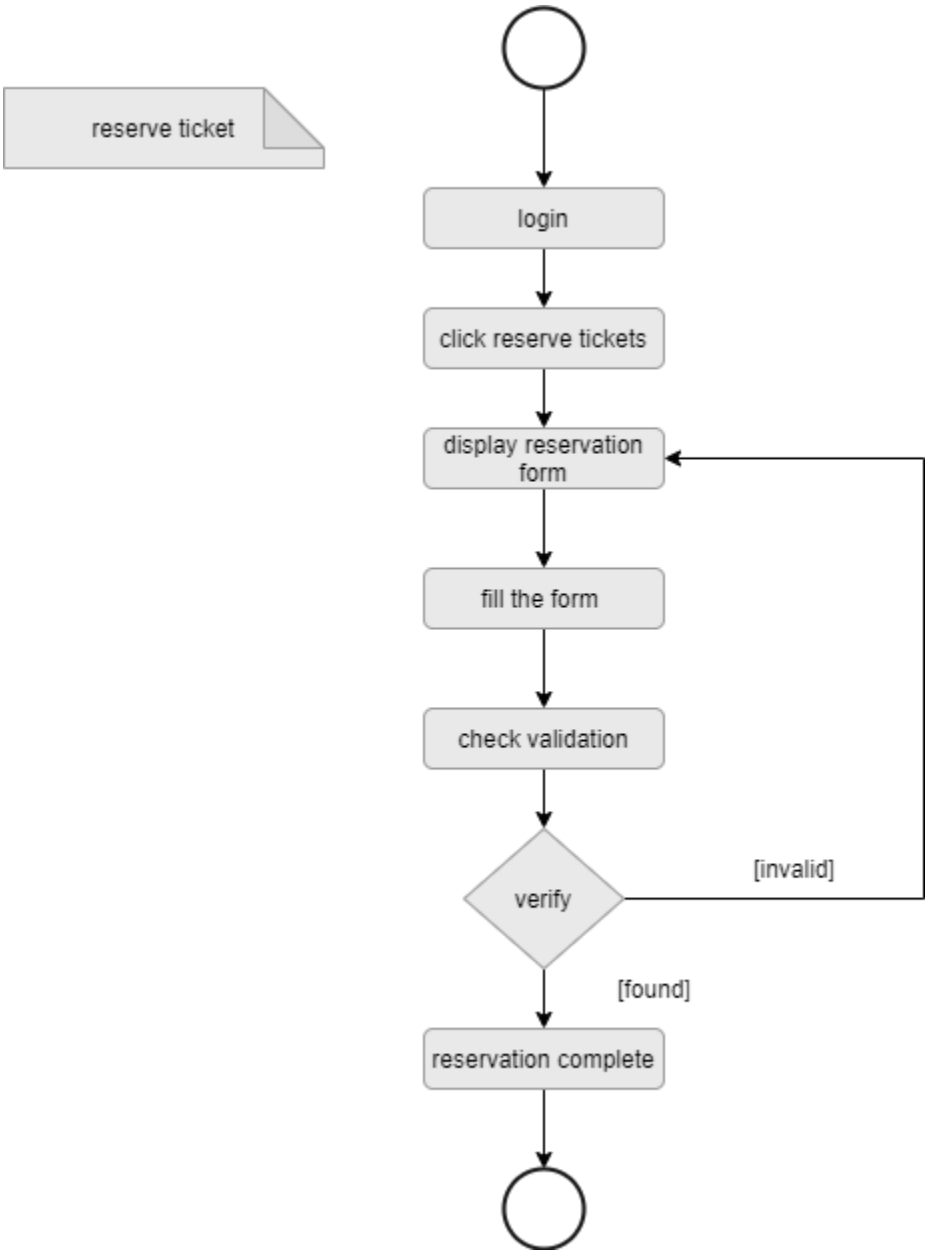


Figure 4. 12 Reserve ticket activity diagram

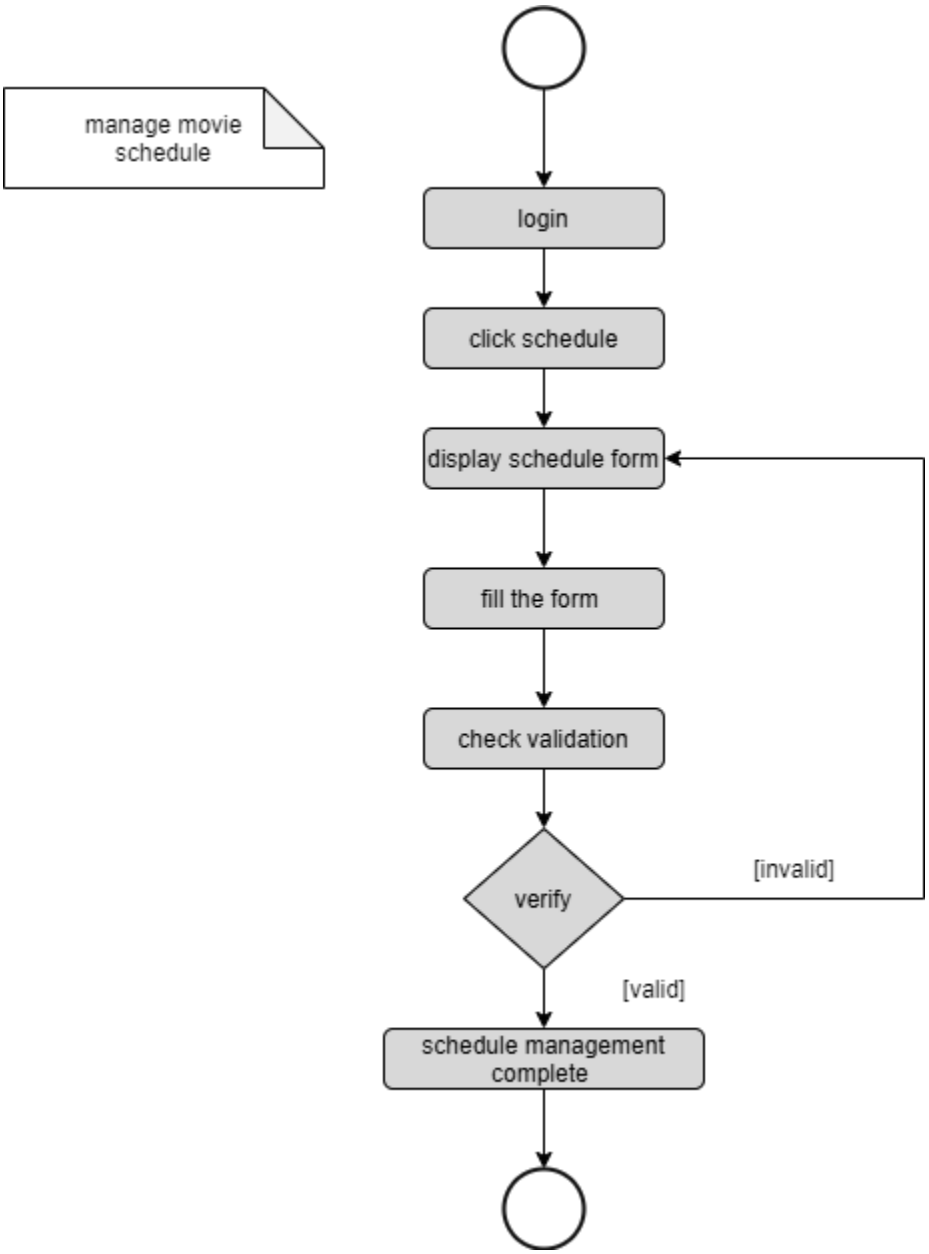


Figure 4. 13 Manage movie schedule activity diagram

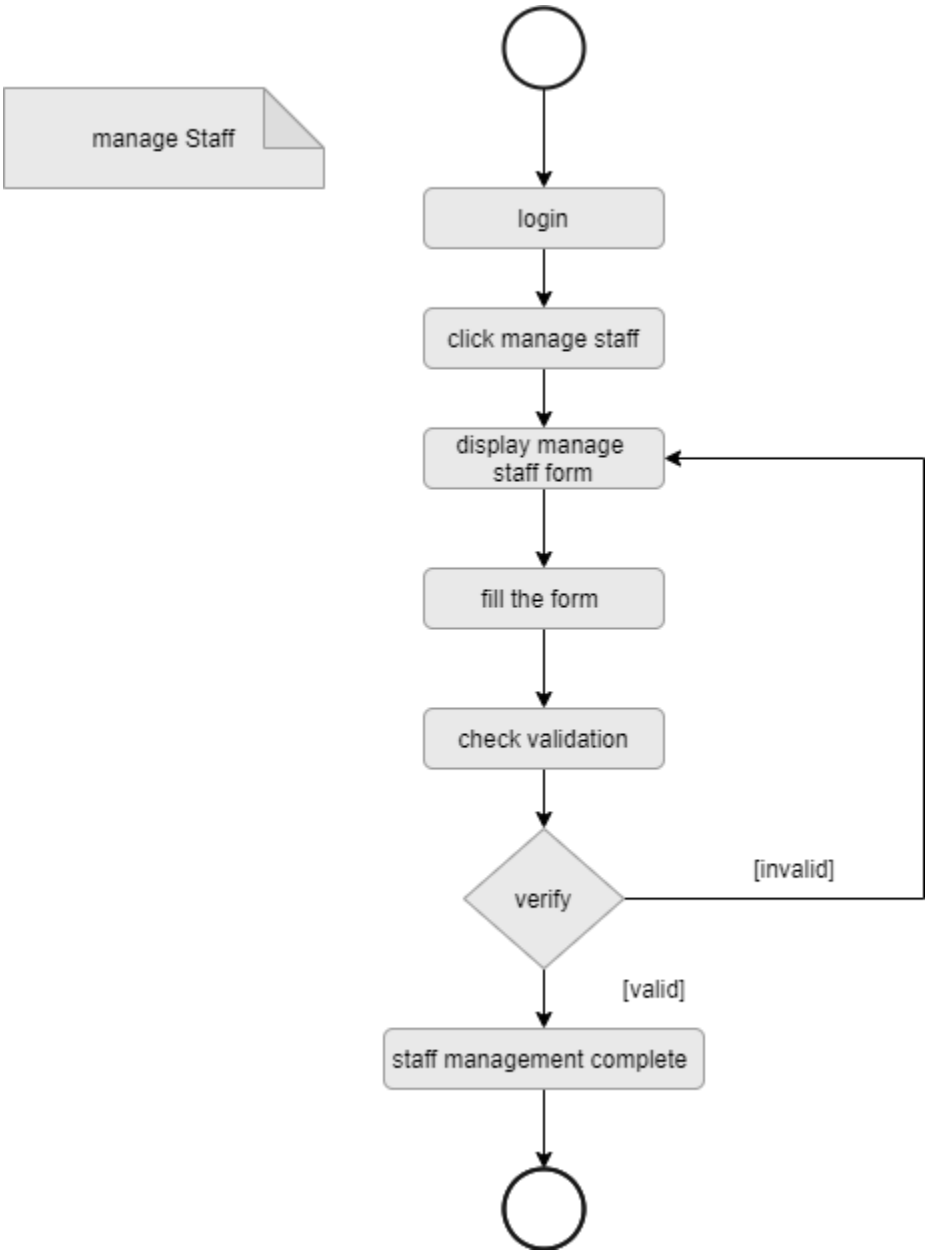


Figure 4. 14 Staff management activity diagram

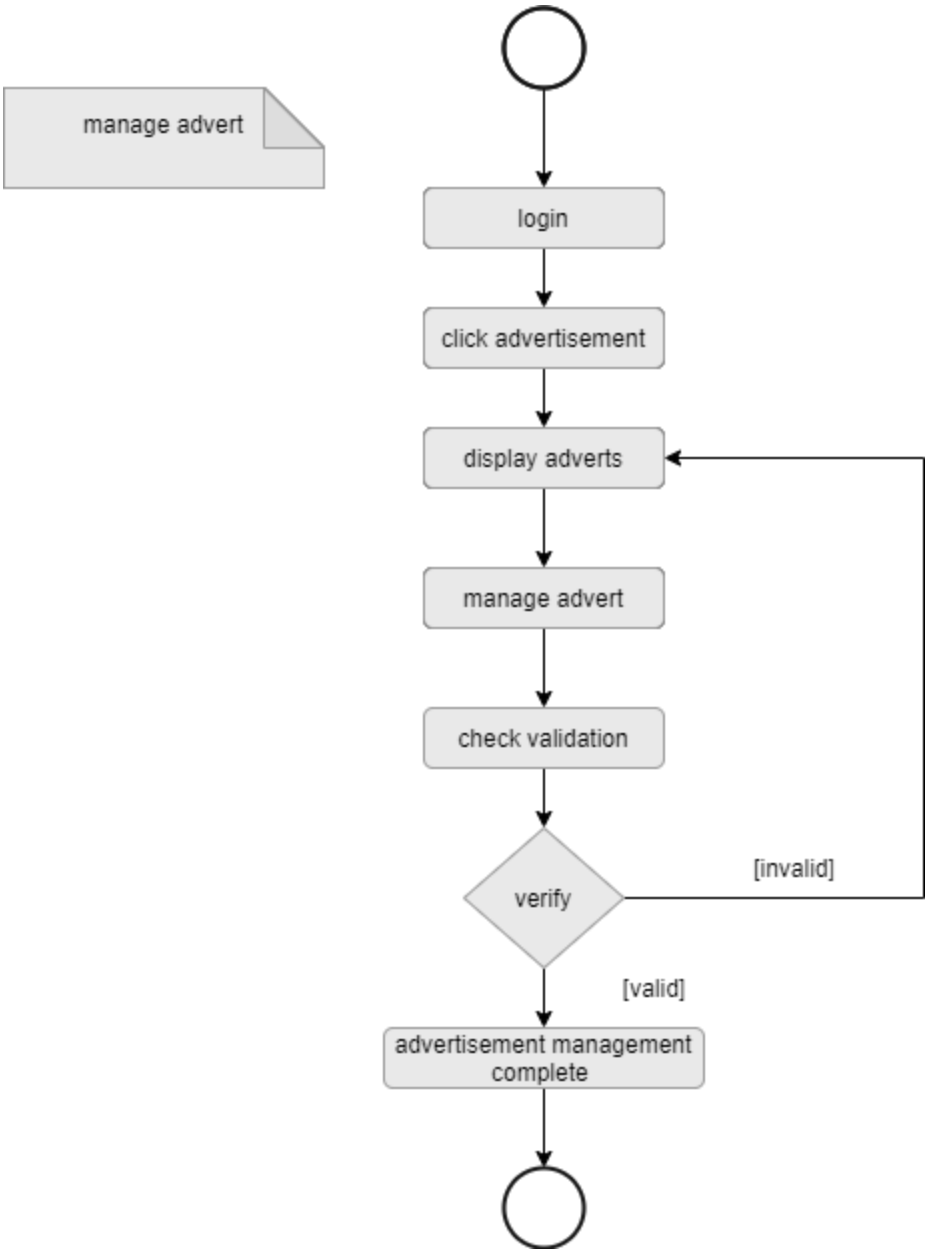


Figure 4. 15 Advert movie activity diagram

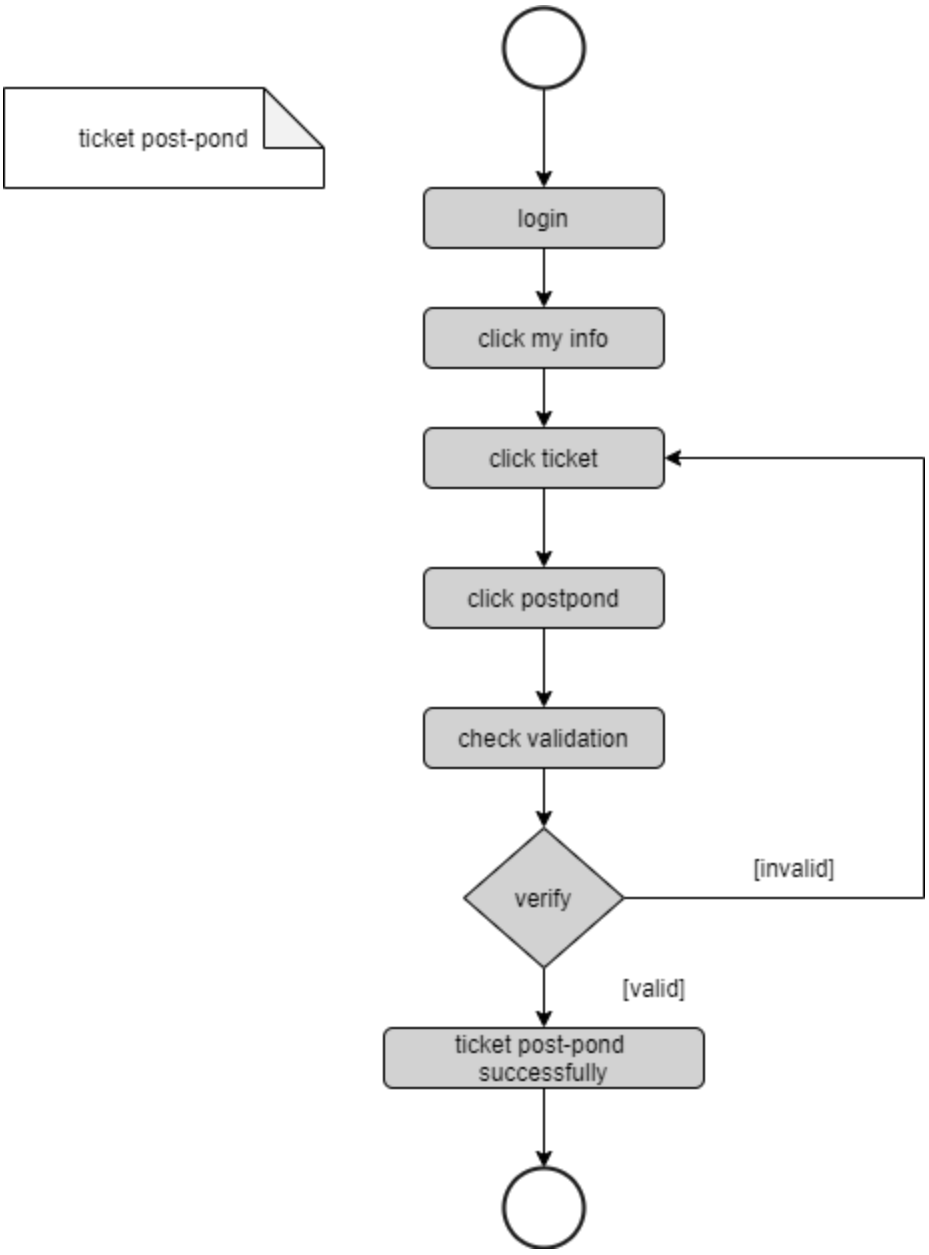


***Figure 4. 16** Post-pond ticket activity diagram*

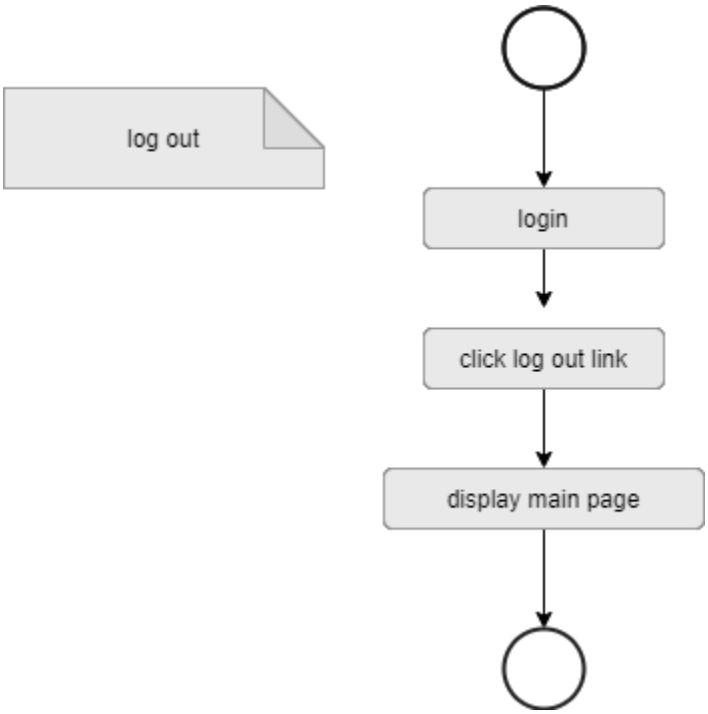


Figure 4. 17 Log out activity diagram

4.2.7 State chart diagram

The state chart diagram used to show the sequence of states that an object goes through the events that cause the transition from one state to the other and the actions that result from a state change.

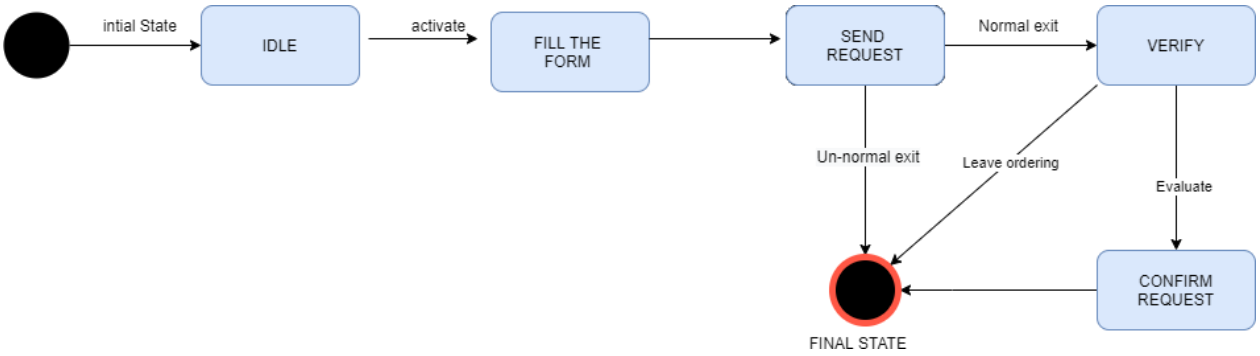


Figure 4.18 login State Chart Diagram

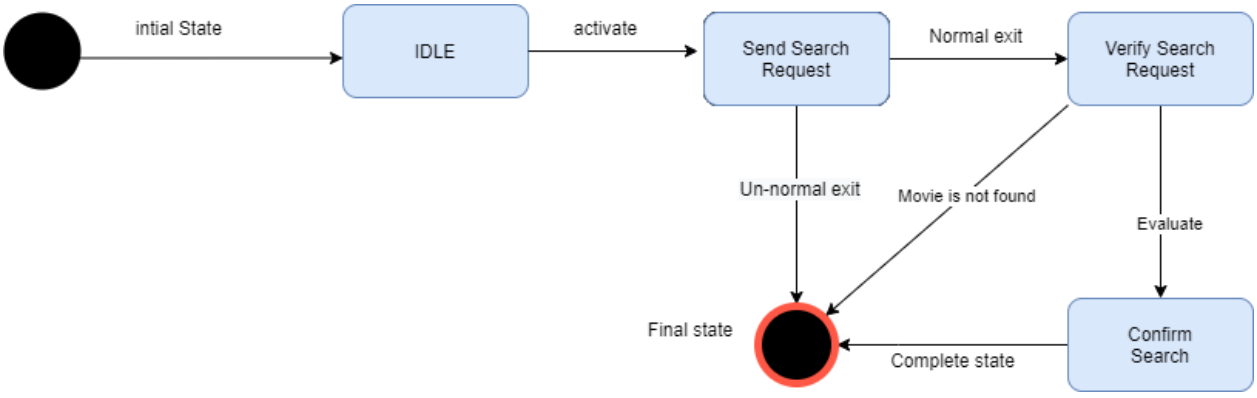


Figure 4. 19 Search State Chart Diagram

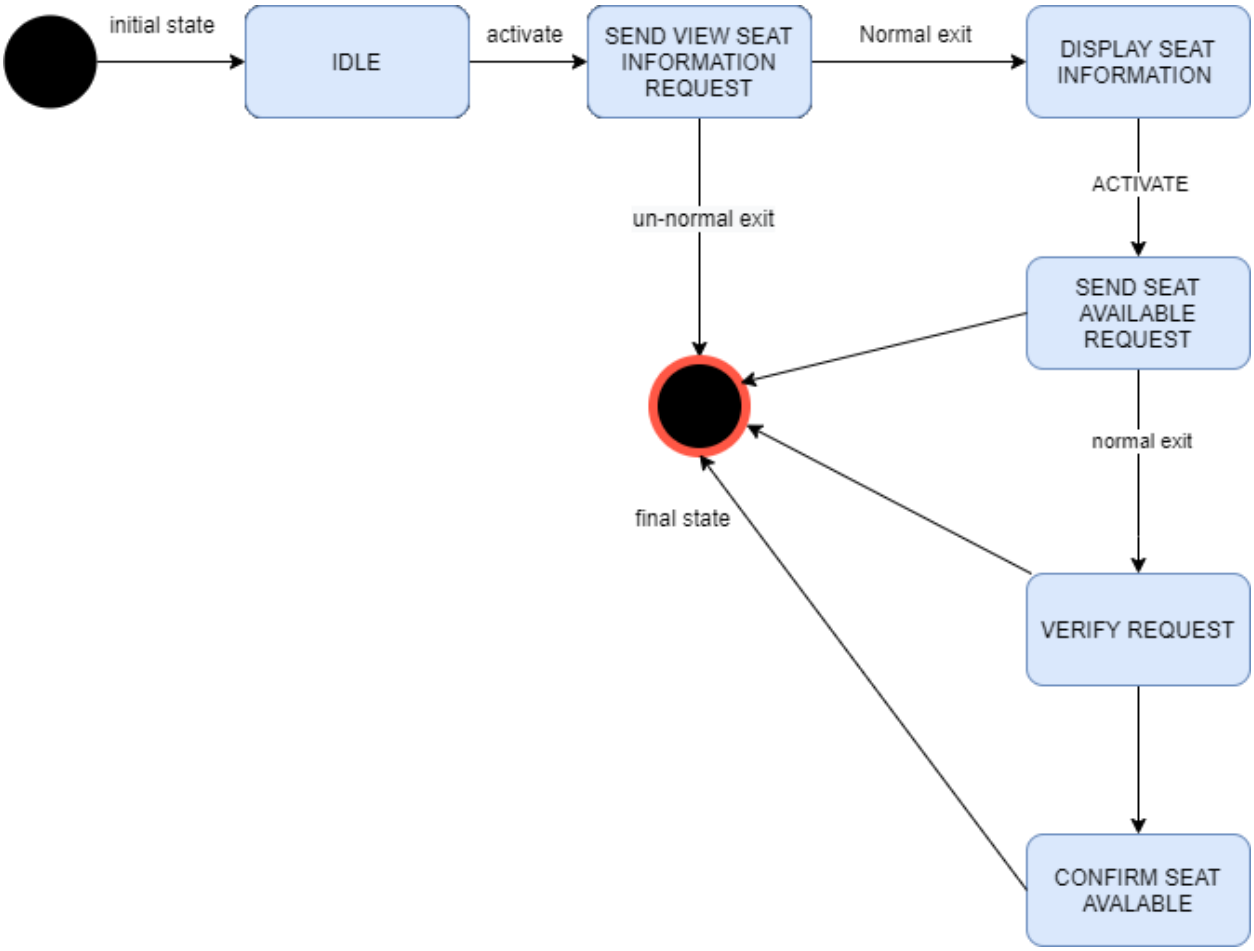


Figure 4. 20 Reserve ticket State Chart Diagram

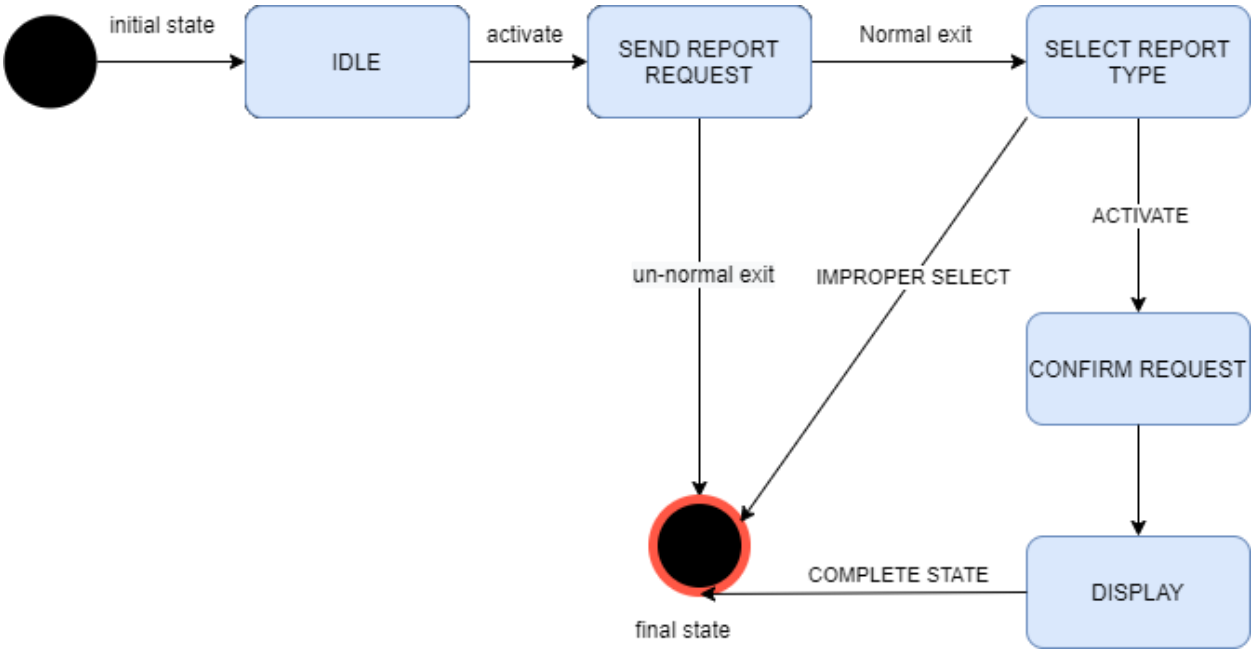


Figure 4. 21 view seat information State Chart Diagram

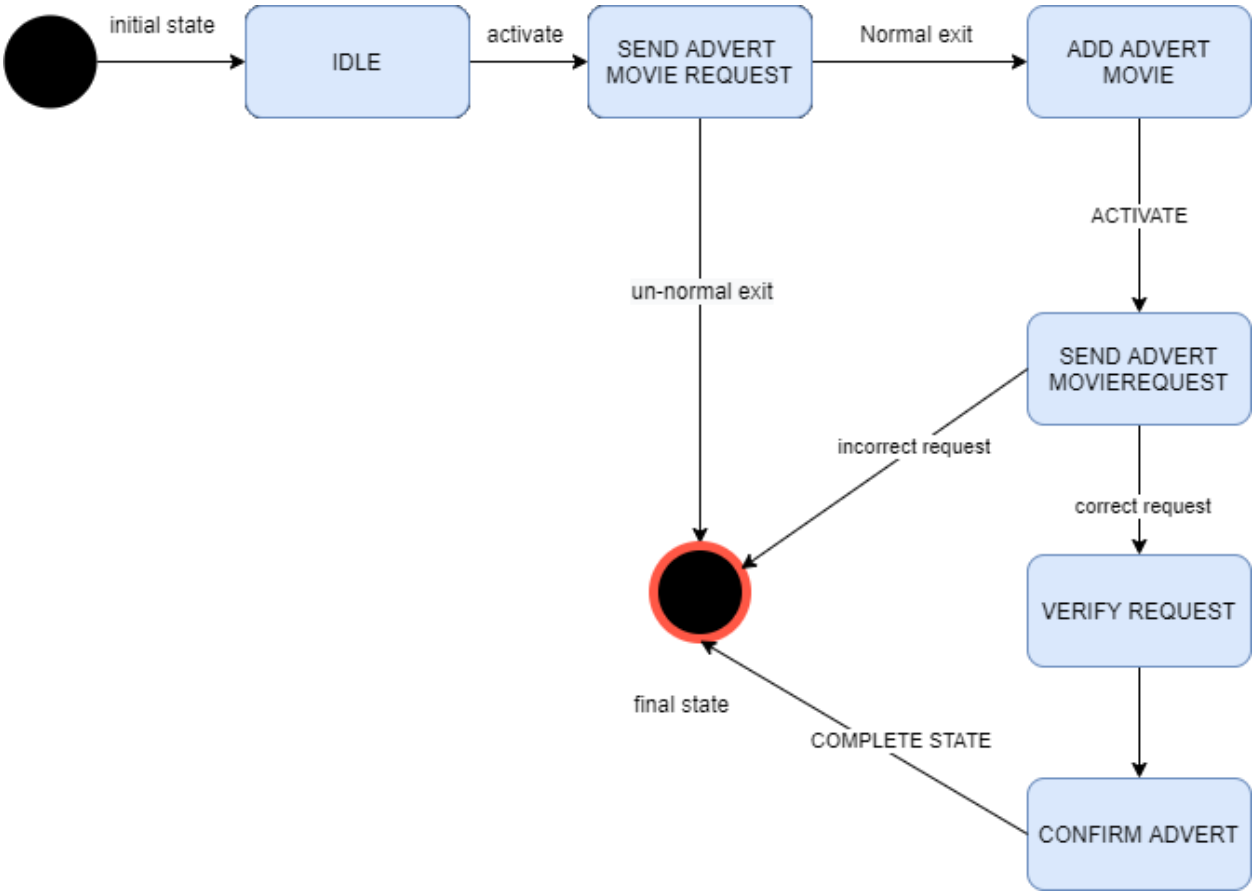


Figure 4. 22 State chart diagram for view report

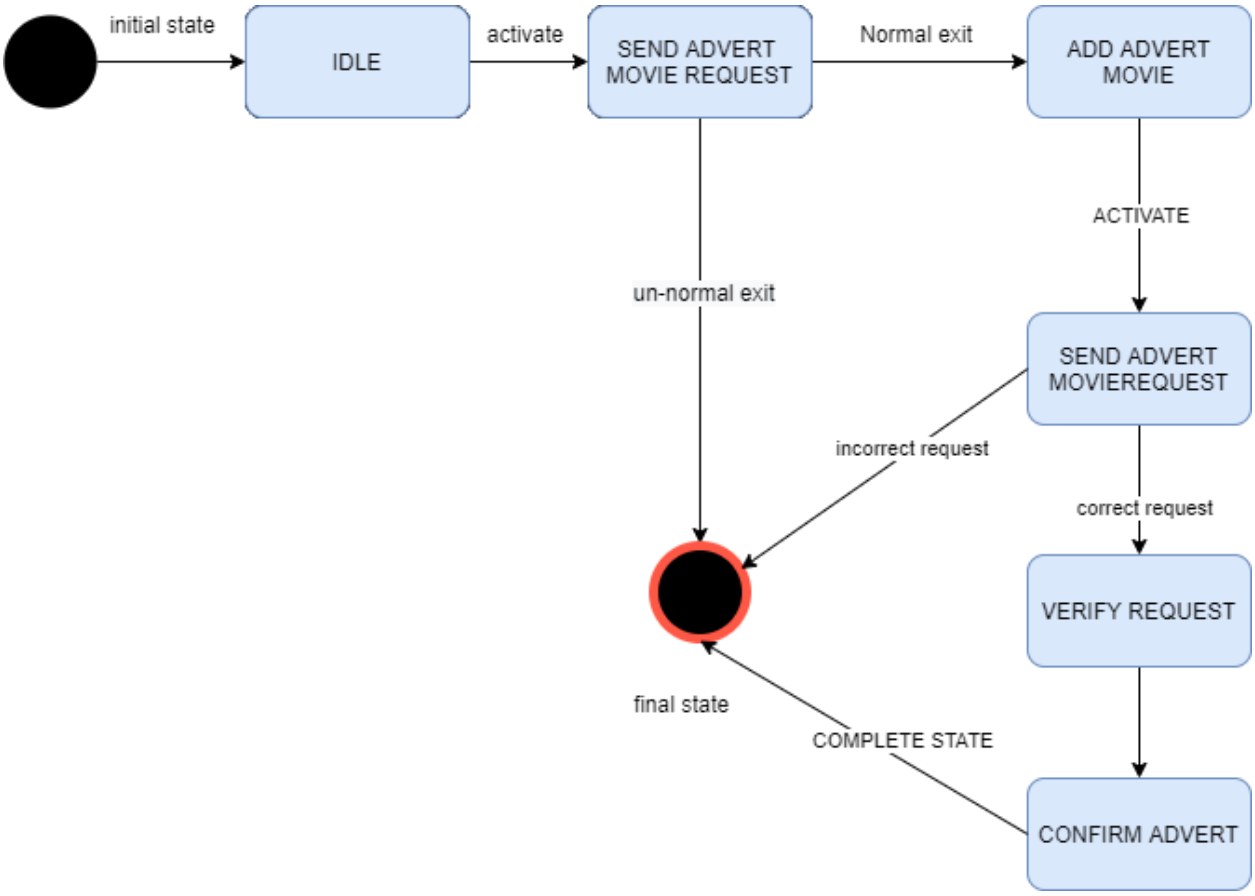


Figure 4. 23 State chart diagram for Advert movie

CHAPTER FIVE

5. SYSTEM DESIGN

System design in a project refers to the process of defining the architecture, components, modules, interfaces, and data for a system to meet specified requirements. It involves creating a plan for the system that outlines how it will be built, how its different parts will work together, and how it will be tested and deployed. System design is a critical part of the software development life cycle and helps ensure that the final product is efficient, reliable, and scalable.

During system design, the project team identifies the key requirements of the system and maps out the overall structure, components, and their interactions. They also specify how the system will handle data storage and retrieval, security, performance, and scalability. Once the design is complete, the team can use it as a blueprint to guide the development, testing, and deployment of the system.

Overall, system design plays a crucial role in the success of a project by ensuring that the final product meets the needs of its users and stakeholders.

5.1 Design goals

In this project design, there are several goals that we tried e to achieve. Here are some common design goals:

- The design should be user-friendly, easy to learn and use, and intuitive for the target audience.
- The system should be designed to allow users to complete the booking process quickly and easily. This includes minimizing the number of steps required to make a reservation, providing clear and concise instructions at each step, and automating as much of the process as possible.
- Aserver is required to handle the ticket reservation requests from multiple users simultaneously. It should be equipped with enough processing power, memory, and storage to handle the load.

- A database server is required to store and retrieve ticket reservation data. The database server should have enough storage capacity, processing power, and memory to handle a large number of ticket reservation requests.

The system should be designed with strong security measures to protect against data breaches, hacking attempts, and other security threats. This includes firewalls, antivirus software, and data encryption.

5.1.1. User Interface and Human Factors

The user interface of the system shall be interactive, users friendly, and easy to learn and not confuse users. Anyone can access the website on the desktop or laptop computer.

5.1.2. Hardware Consideration

The system/web portal/ shall work on all devices with an updated browser. The system should interact with a server, so the server should have supported enough storage.

5.1.3. Security Issues

Security concerns should be addressed through the implementation of security policies such as the use of user login credentials and access restrictions (policies).

- The system is secured. i. e. user must be able to give rights or deny for all users based on his/her position by the administrator of the system.
- Use different algorithm to encrypt the password.
- The password is strong (8) character string.
- All major operations/transactions done on the system should be logged to the central database that means all of the users have their own login page.
- The database will use MD5(message digest 5)cryptographic hash function which ensure the integrity of data and prevent unauthorized modification or tampering
- Any change in the structure of the database is shall done by administrator.

5.1.4. Performance Consideration

Since the system will be accessed by users (admins, service providers and service seekers), it shall be optimized to ensure a reasonable amount response time and throughput while handling and processing queries quickly.

1. **Response Time**- Upon request for user inquiry the system under normal condition should display results as quickly as possible.

2. **Processing Time**- Since the system is developing with efficient programming language and database upon request for user's Activities the system under normal condition should `process the request as quickly as possible by using multi-tier architectures.

3. **Concurrent** - Processing the system can support multiple users at a time.

Efficiency:

- ✓ The system gives appropriate output based on the expected lists of inputs.
- ✓ The system must ensure allocation and use of services being requested for the users by using minimum memory storage, cost, time and human power.

Accuracy:

- ✓ Proposed system will be better due to reduction of error. All operation can be done correctly and it ensures that whatever information is coming from the data base is accurate.

5.1.5. Error Handling and Validation

Accidental threat like improper data input, destruction of data during processing shall be controlled by the system.

- **Incorrect input** :- the system handles many exceptions like inserting empty string to the database, filing the form with incorrect value, and inserting a duplicated Email and display an appropriate message for each error.
- **Login error** :- the system shall handle an attempt to login with incorrect username and password and display appropriate message.

5.1.6. Quality Issues

The system should be available 24 hours a day and 7 days a week unless internet connection is week. The system shall allow users to comment and send bug reports to the development team in order to improve the system

- ➢ **Reliability**:-the system should not fail if there is access of internet.

- **Usability**:-the system that we developed to learn and operate. It will need only little training to use the system.
    1) The interface actions and elements should be consistent
    2) Error messages should explain how to recover from the error
    3) Undo should be available for most actions
- **Availability** :- the system will available for all working day

5.1.7. Backup and Recovery

When team member standard to develop a system they must have to put use a backup mechanism by using cloud storage and removable flash disks.

5.1.8. Physical Environment

The system deploys in a server computer that supports the window operating system and the client computers access it from the server and can use it. In the physical environmental factors, to protect the server from overheat and other natural disasters like rain, the server should keep in well-equipped and ventilated rooms for better protection.

5.1.9. Resource Issues

The systems need a laptop or desktop and a web browser on this device in order to work.

The resource that help for our system (our system consume) are internet, computer or electronic internet based device and electric light to functionalize or to give service this resources are must be needed.

5.1.10. Documentation

Each phase including the proposal, Requirements Analysis Document and System Design Document shall be documented with version number, which is stored GIT hub for the purpose of participating future references.

5.2. Proposed System Architecture

The Proposed system architecture for our system will likely involve a client-server model, where the clients are the Customers and the server is responsible for responding Customers Request.

This model can support multi-tier architecture. so, we will use multi-tier architecture in our system:

- presentation tier
- application tier, and
- database tier

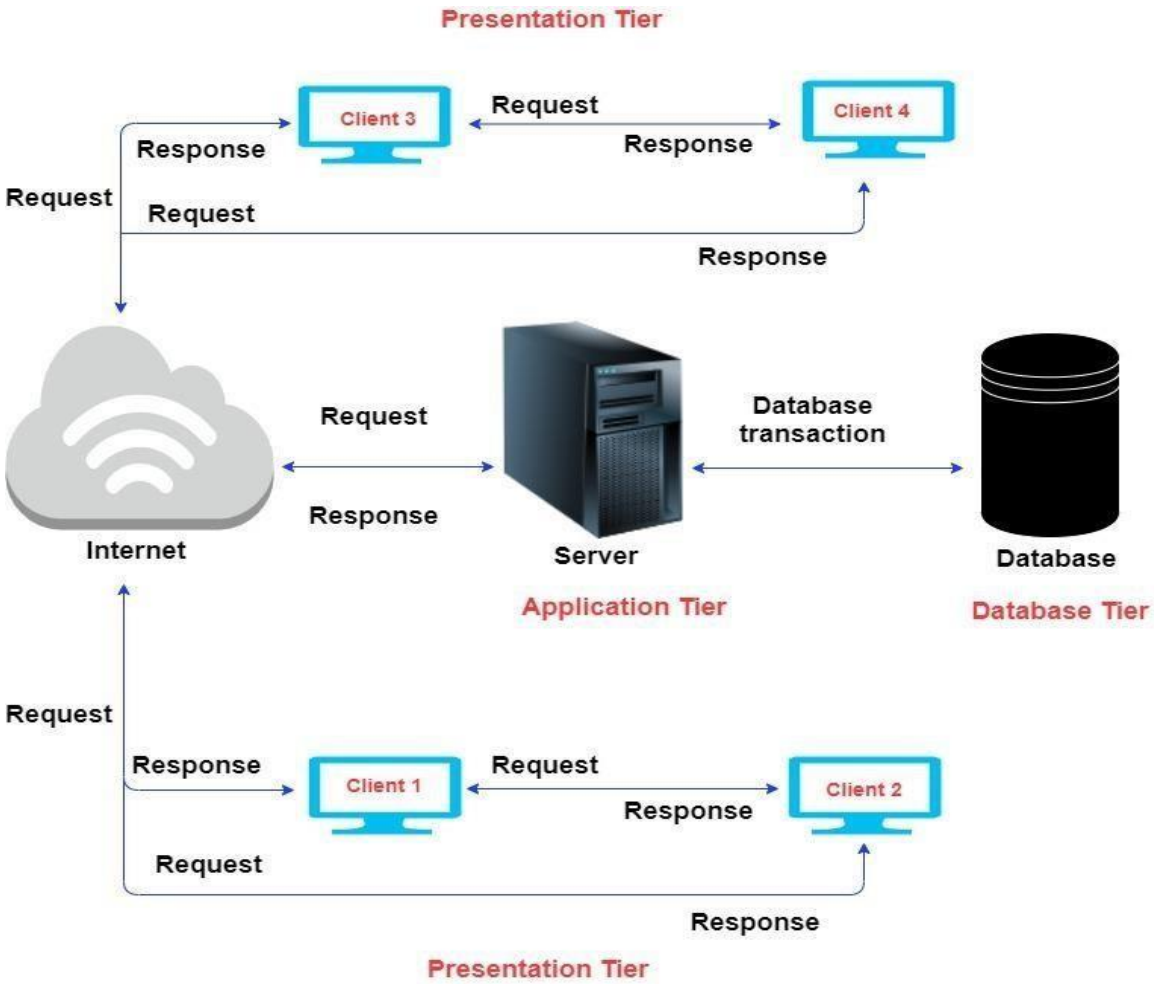


Figure 5. 1 General proposed system Architecture

5.2.1. Subsystem Decomposition and Description

Our Subsystem decomposition will break down a complex system into smaller, more manageable parts, or subsystems. Each subsystem is a functional unit that performs a specific set of tasks within the larger system. Subsystems identified from our system are:

1. **User interface subsystem:** This subsystem deals with the user-facing elements of the application, such as the website or mobile application. It includes components such as the login page, movie, selection screen, payment processing page, and confirmation page.

2. **Movie information subsystem**: This subsystem is responsible for storing and providing information about the movies that are available for reservation. It includes components such as the movie database. Which subsystem would typically including Movie listing , details reviews and rating.

3. **Booking subsystem:** This subsystem handles the booking of tickets, including selecting seats, reserving seats, and generating tickets. It includes components such as the ticket booking engine, which processes ticket requests and assigns seats to users.

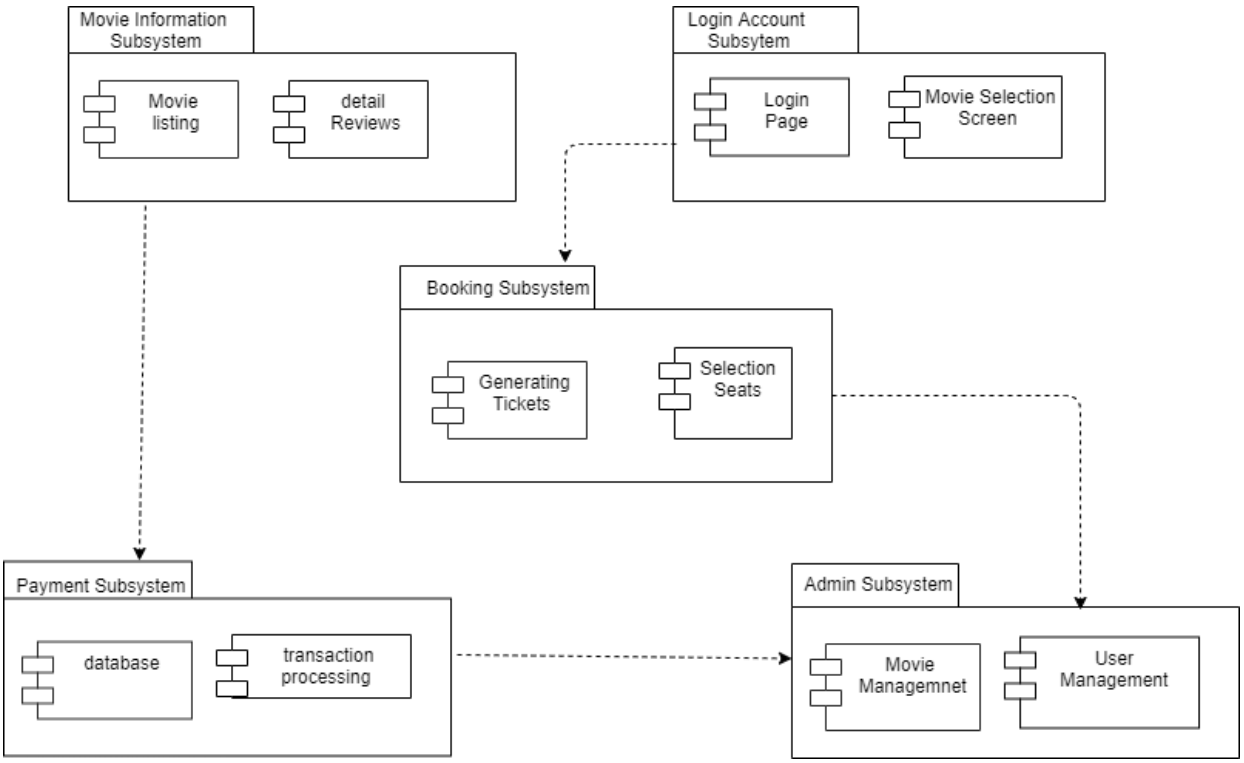
4. **Payment subsystem**

This sub system handles payment using API. An API is a set of programming instructions and standards that allow two applications to communicate with each other. In the case of a payment gateway, the API allows businesses to send payment requests and receive responses from the payment gateway securely and automatically.

We tried to integrate Chappa API system, which allows businesses to integrate their payment processing capabilities directly into their websites, mobile apps, or other applications.

Steps to use and integrate an API in the online payment process for a cinema ticket reservation system:

5.Admin subsystem: This subsystem is responsible for managing the system's backend and en- suring its smooth operation. It includes components such as the user and movie management sys-tem, which allows administrators to add or remove users and movies from the system.



5.2.2. Hardware/Software Mapping

Hardware/software mapping is the process of identifying the relationship between the software components of a system and the underlying hardware on which they run.

Software components

1. Web Server: Apache server serves as the platform for the web application and handles all incoming requests and responses to the client.
2. Database Management System: The cinema ticket reservation system requires a database to store all the relevant data such as user information, movie information, and ticket information. MySQL used.
3. PHP Framework: A Laravel PHP framework is a software framework that is used to build web applications quickly and efficiently.
4. Payment Gateway Integration: To process online payments, the system may need to integrate with a payment gateway provider such as Chappa
5. Programming Language: HTML, CSS, and JavaScript technologies are used to create the user interface and front-end of the web application.

Hardware Components:

1. Server: The cinema ticket reservation system requires a server to host the web application. The server can be a physical server or a cloud-based virtual machine.
2. Network: The network connects the server and allows for communication between the server and the client devices.
3. Storage: The server needs storage to store the web application, the database, and any other files that may be required.
4. Input/output Devices: The server may require input/output devices such as a keyboard, mouse, and monitor for maintenance and configuration purposes.
5. Security Components: The cinema ticket reservation system must have security components such as firewalls, antivirus software, and intrusion detection systems to protect against threats and unauthorized access.

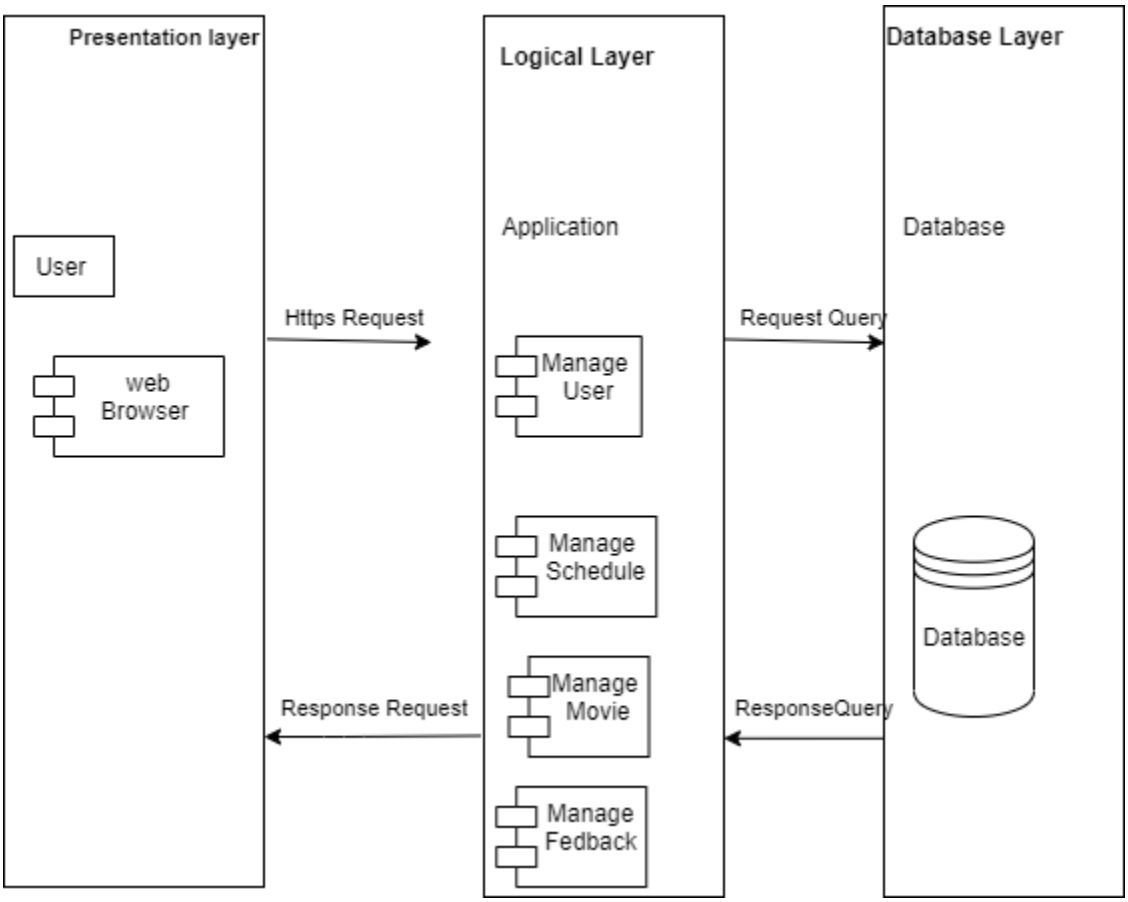


Figure 5. 3 Deployment Diagram

5.2.3 Detailed Class Diagram

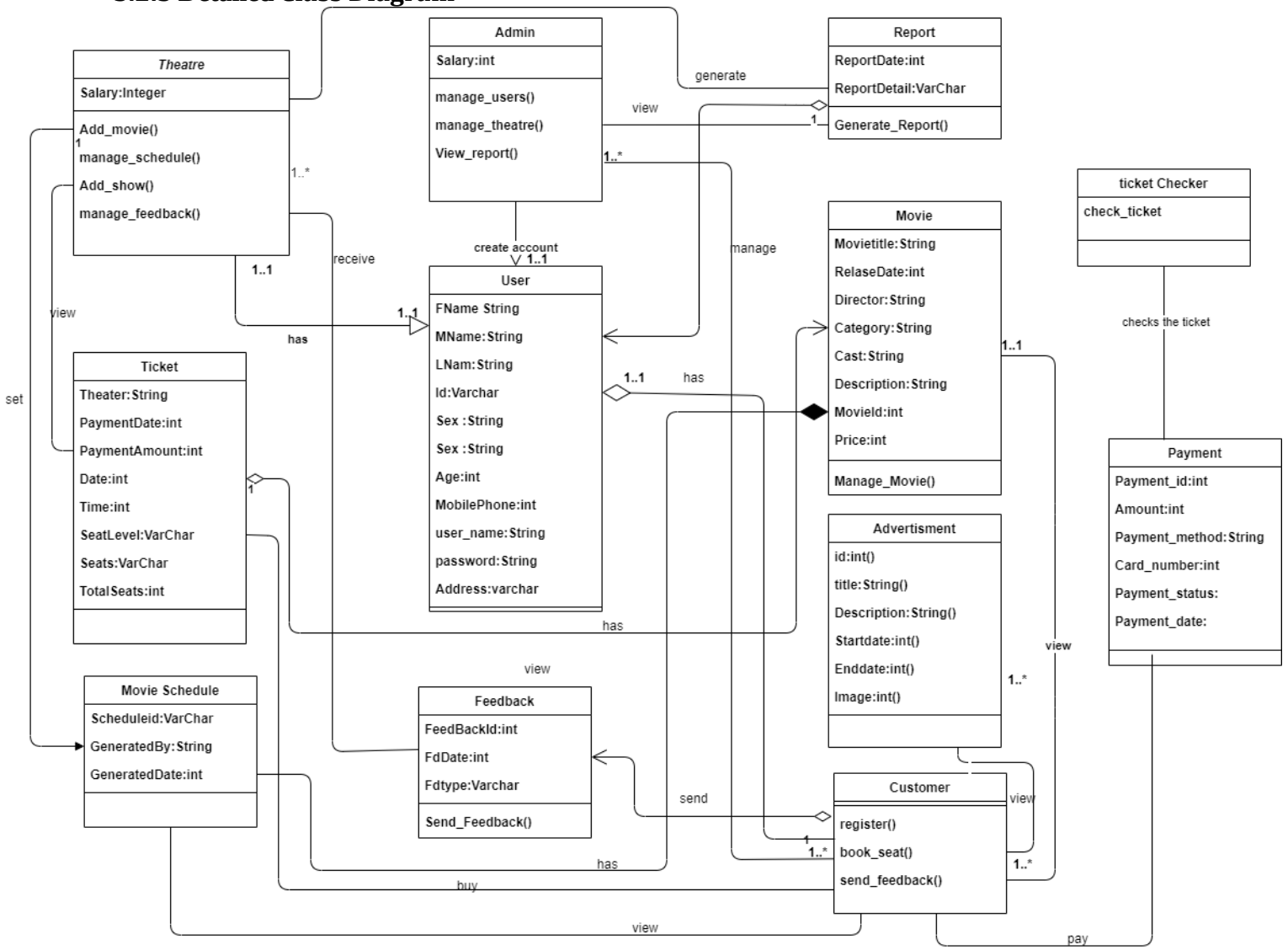


Figure 5. 4 Detailed class diagram

5.2.4. Persistent Data Management

The database schema will be designed to accurately reflect the data entities and relationships in the cinema ticket reservation system. This may include tables for movies, show-times, seats, users, and transactions, among others. A data access layer will be implemented to allow the application to interact with the database. The data would be stored in a relational database such as MySQL. This may include functions for inserting, updating, deleting, and querying data from the database, as well as handling errors and enforcing data validation rules.

The system would enforce data integrity constraints to ensure that the data stored in the database is accurate and consistent. For example, the system could use database triggers to prevent over-booking of seats for a particular show-time.

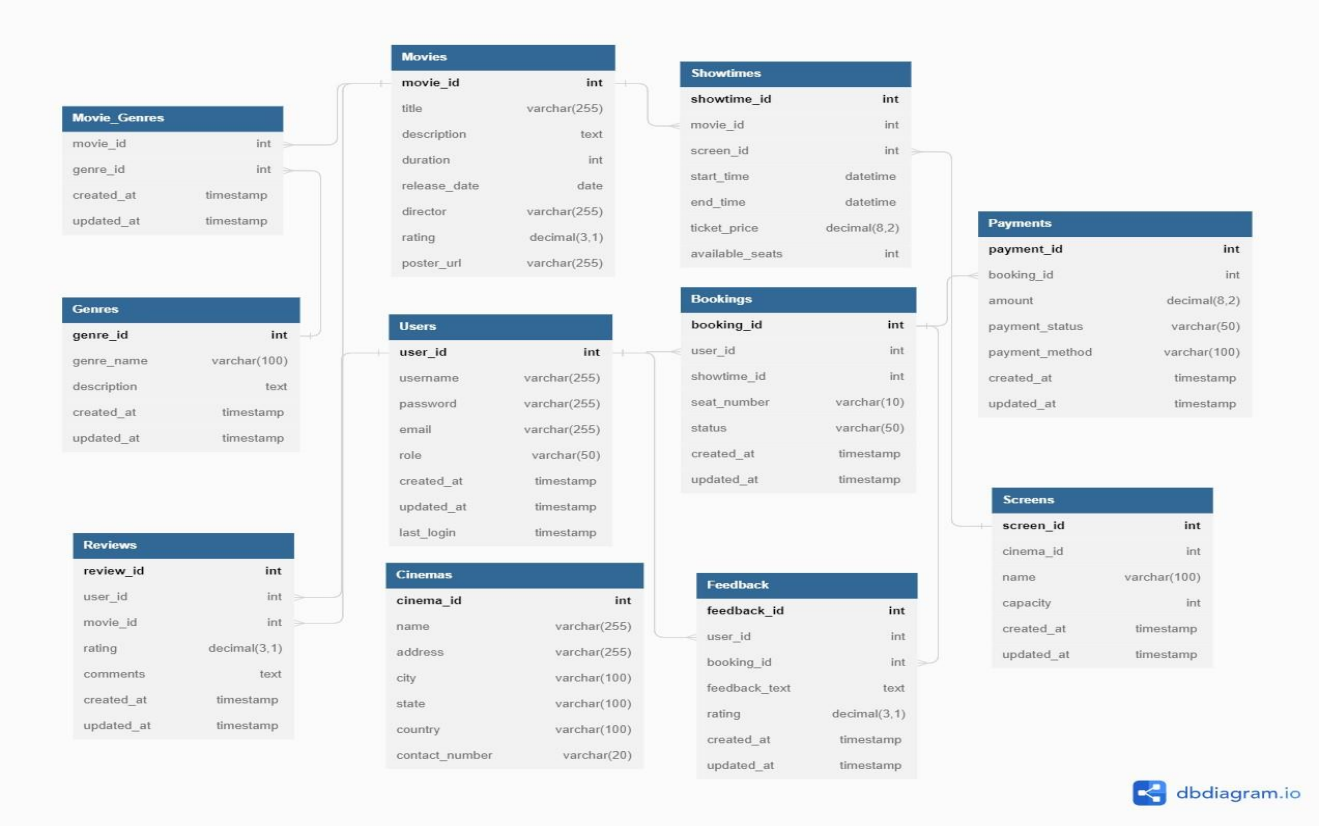


figure *5.5 persistant data diagram*

5.2.5. Access Control Security

Access control and security in our system involves defining user roles and privileges, as well as managing their access to system resources. This section includes a description of the user model, which outlines the access privileges of different types of users.

In addition, tables can be used to indicate the privileges assigned to each user of the system, providing a clear overview of who has access to what information.

Activity	Admin	Theatre	Customer	Ticket checker
Login	✓	✓		✓
Create Account	✓			
Manage Schedule		✓		
Add Movies		✓		
View Report	✓	✓		
Monitoring System	✓			
View ticket information		✓	✓	✓
Give Feedback			✓	
Financial Report		✓		

View Schedule		✓	✓	
Advert Movies				
Reply Feedback	✓	✓		
Update password	✓	✓		✓
Generate Report		✓		✓
Manage Payment				✓

Table 5.1 Access Control Security

5.3 Packages

In this section, we relate classes and modules within a subsystem. The package diagrams provide a visual representation of the relationships between the packages, including dependencies and inheritance. The goal is to make it easy for developers to locate and work on specific modules and for future updates and maintenance of the system.

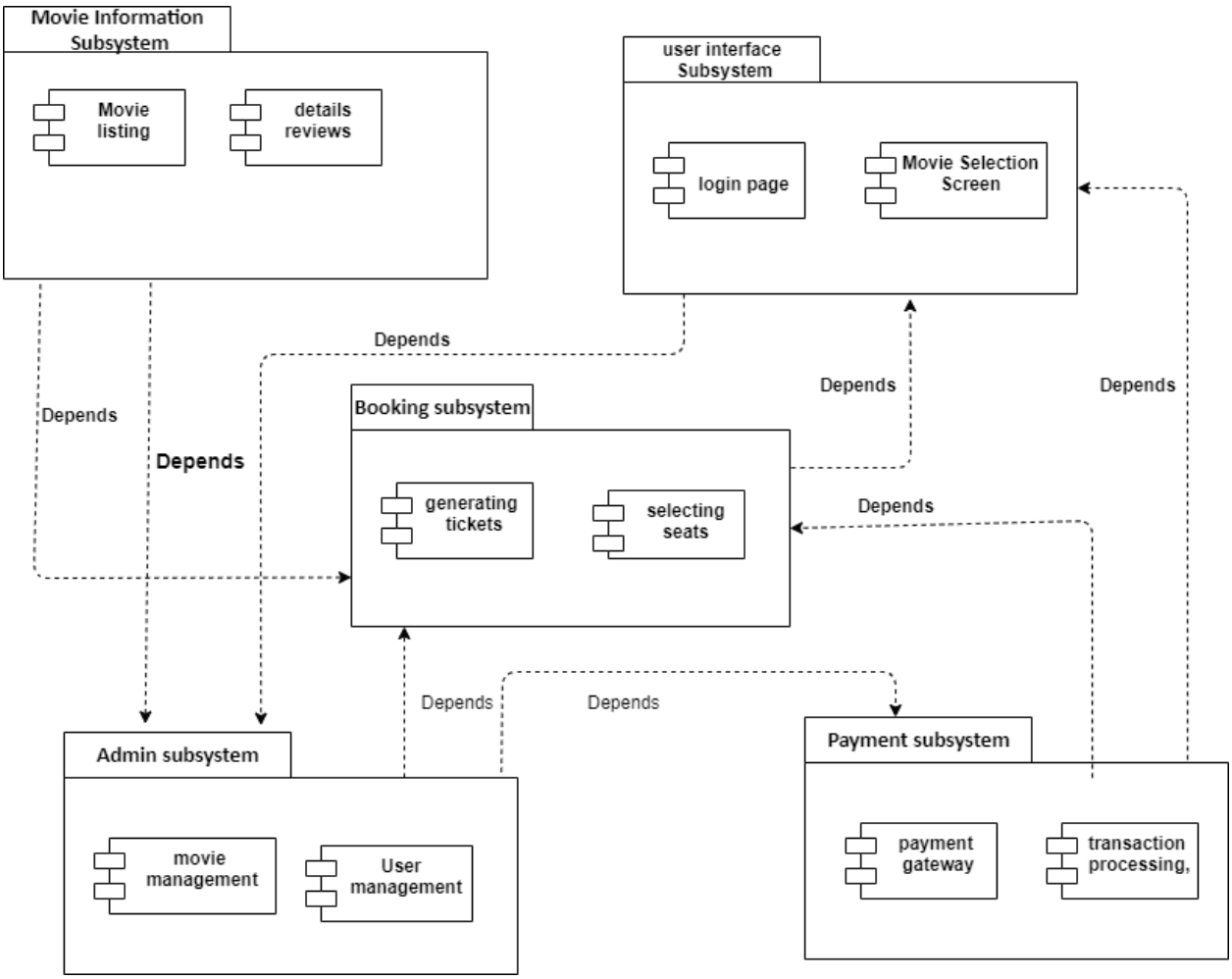


Figure 5. 5 Packages Diagram

5.4 Algorithm Design

Algorithm: Login ()

BEGN

Login (user-name, password)

INPUT: User-name and Password

IF (User exist)

THEN

READ Password FROM database

IF (Password == Entered Password)

Login successful

ELSE

PRINT “incorrect password “

END IF

ELSE

PRINT “incorrect User-name or password “

END IF

END

BEGN

Ticket reserve (Name,Phone number,Card Number)

INPUT: Name,Phone number and Card Number

IF (Value Valid)

THEN

INSERT Name,Phone_number,Card_Number TO Database

IF (Name,Phone number or Card Number==TRUE)

Reservation successful

ELSE

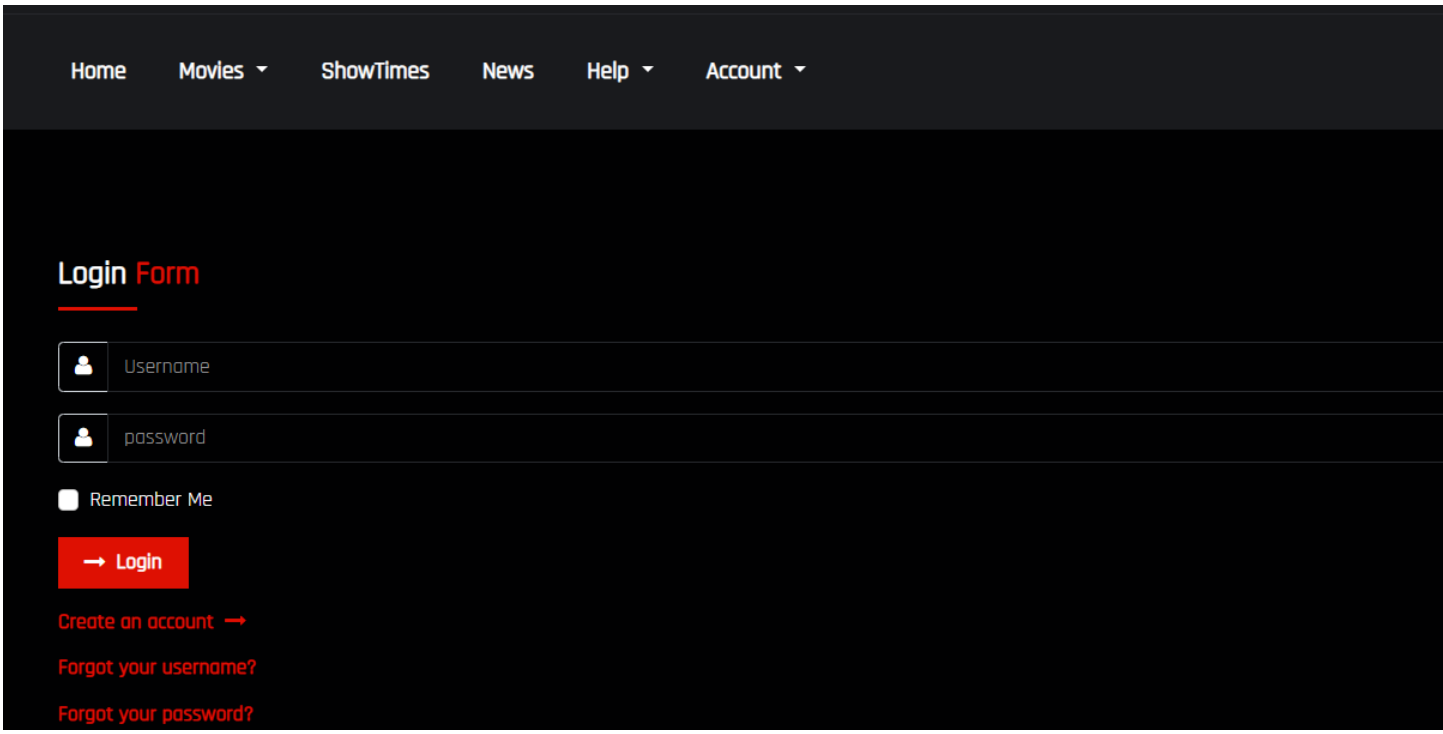
PRINT “Reservation Failed“

ELSE

PRINT “incorrect name or Phone number“

END

5.5 User Interface Design



CHAPTER SIX
IMPLEMENTATION AND TESTING

6.1. Implementation

The Implementation phase in the software life-cycle is where the actual software is implemented. It is the critical phase in which it transforms the design and analysis of the system into tangible system by writing the code to the system to be developed and make is operational and applicable by testing debugging the functionalities that are done. The result of this phase consists of source code, together with documentation to make the code more readable. The main objective of this phase is generally is to deploy and enable operation of the new information system in the production environment. During implementation and operation, physical design specification must be turned into working computer code, and then the code is tested until most of the errors have been detected and corrected.

Sample code :-

```
Create the Customers table
CREATE TABLE Customers (
  customer_id INT PRIMARY KEY,
  first_name VARCHAR(255),
  last_name VARCHAR(255),
  address VARCHAR(255),
  city VARCHAR(100),
  state VARCHAR(100),
  country VARCHAR(100),
  contact_number VARCHAR(20),
  email VARCHAR(255) UNIQUE,
  created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
  updated_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP
);
```

```
-- Create the User table
CREATE TABLE User (
  user_id INT PRIMARY KEY,
  name VARCHAR(255) NOT NULL,
  email VARCHAR(255) NOT NULL,
  password VARCHAR(255) NOT NULL,
  created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
  updated_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
  last_login TIMESTAMP,

);

-- Create the Movies table
CREATE TABLE Movies (
  movie_id INT PRIMARY KEY,
  title VARCHAR(255) NOT NULL,
  description TEXT,
  duration INT,
  release_date DATE,
  director VARCHAR(255),
  rating DECIMAL(3,1),
  poster_url VARCHAR(255)
);

-- Create the Genres table
CREATE TABLE Genres (
  genre_id INT PRIMARY KEY,
  genre_name VARCHAR(100) NOT NULL,
  description TEXT,
  created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
```

```
  updated_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP
);
```

6.2. Configuration of application server

We have been used XAMPP as application server because it is a simple, lightweight Apache distribution that isextremely easy for us to create a local web server for testing and deployment purposes. Since the basic job of allweb servers is to accept requests from clients (visitor of web browser) and then send the response to that request(the components of the page that a visitor wants to see). And a web server is an essential part of any website, since our developed system is web-based system, we had used Apache web Server which is open-source software.

- In the configuration process its installation is straightforward and simple then set upped and run the configuration to start, stop, and configure the services by opening the dashboard.
- It is integrated with most popular operating systems. We use XAMPP for windows.
- It is automatically installed on our computer as we install it.
- It is free web server and supports many operating systems.
- It is used to easily run and test websites and web applications locally.

6.3. Configuration of application security

Since our system involves storing of some personal data, we put some security mechanisms like unauthorized person cannot login into the system because the system requires a user name and password. Web application security is the process of securing confidential data stored online from unauthorized access and modification. We have implemented all input validations properly in order to secure our system. Since the system developed to the users who may senior to computer or may professional to computer so all inputs must be implemented.

easily and sample to use. When the user enters invalid inputs or empty, the system notifies to the user to inter valid inputs. In order to secure our system, we have been performed the following activities: -

- ✓ All inputs were validated properly
- ✓ User accounts was assigned with necessary access privileges
- ✓ Sessions was implemented

6.4. Testing

Developing software is a complex process. No matter how hard we try to eliminate all faults simply by going through the development phases which is requirements elicitation, requirement analysis, system design, and implementation, however through good practice we can make sure that the most series fault does not occur in the first place. In addition we need a separate testing phase, with the goal of elimination all remaining faults before release the system.

Testing is the final phase of implementation. Testing is a process to show the correctness of the program. Testing is checking of the system workability in an attempt to discover errors and avoiding such errors from the system. In this the team members tested the entire system as a whole with all forms and code. In this we tested all the functionalities in the System. All errors in the forms, functions, modules have been tested.

Test case scenario name: Login

#	Test Case	Input Data	Expected Result	Actual Result
1	When empty values to username and password fields are entered		An error message “Insert username and password” is displayed	An error message “Insert username and password” is displayed
2	When a wrong username or password enter		An error message “Incorrect username or password” is displayed	An error message “Incorrect username or password” is displayed
3	User Login		Redirects the user to his respective page	Redirects the user to his respective page

Figure 6. 1 **Table Test** Login

6.1. Sample Test

To simplify the testing process, the project team followed the different types of tests that break the testing process up into the distinct levels. These types testing are functional testing (unit testing, integration testing, acceptance testing and system testing) and non-functional testing (Security testing).

Unit testing: Unit testing is a validation method in which a programmer tests if individual units of source code are fit for use. The system units are tested one by one by inserting invalid data.
Integration testing: In this testing part, all the modules combined together and tested for fitness with each other and with the systems functionality. If error occurs in combining them, the module with problem will be identified and re combined.
Acceptance testing: Acceptance testing is the process of testing system prior to its delivery. A

system is mainly developed for an end user normally a customer of the organization. A system is said to be accepted if and only if the user of the system is satisfied.

System testing: It is the final step of testing. In this the team members tests the entire system as a whole with all forms, code, modules. This form of testing is popularly known as Black Box testing or System tests. In this the team members tests all the functionalities in the System

CHAPTER SEVEN
CONCLUSION AND RECOMMENDATION

7.1 Conclusion

In chapter one, we discussed the background of the project. We have identified the problem statement, set objectives for the project; described parties that benefit from our project and have chosen data collection and system methodology that is suitable for conducting this project.

In chapter two, we have identified activities of the project; we have studied their business processes, identified the problems that take place in the existing system, studied the forms and reports used and identified the players of the project. After that, next chapter, chapter three we have identified the functional requirements of the system to solve the problems of the existing system that is identified during the analysis process. In this chapter essential modeling, the non-functional requirements of the system and the collaboration among different classes has been modeled.

After covering the business area analysis of the project, the next chapter, chapter four, we have described the design phase of the object-oriented system development and design of the Cinema ticket reservation system . This chapter covered some concepts of object-oriented design as introduction. We have modeled the system use case diagram along with its description, identified actors that can use the system, identified user interface for the system, depicted the class diagram and included the description of the class diagram, drawn the sequence diagram ,activity diagram and built a user interface prototype of the new system.

7.2 Recommendation

We highly recommend utilizing the cinema ticket reservation system to enjoy the convenience, flexibility, and advantages it offers. By leveraging this system, you can have a seamless movie ticket booking experience, secure your prefe We highly recommend utilizing the cinema ticket reservation system to enjoy the convenience, flexibility, and advantages it offers. By leveraging this system, you can have a seamless movie ticket booking experience, secure your preferred seats, and make the most of exclusive offers and loyalty programs. Embrace the convenience of technology and enhance your movie outings with the cinema ticket reservation system.

7.3 References

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- Writing Effective Use Cases by Alistair Cockburn
- UML Modelling Diagram," [Online]. Available: http://www.google.com. [Accessed 02 December 2015].
- Just Enough Software Architecture: A Risk-Driven Approach by George Fairbanks forwarded by David garlans
- [6]Modern system analysis and design third edition by JEFFERY A.HOFFER, JOEY F.GEORGE, and JOSEPH

7.4.Appendices

Appendix I

Sample of login page source code.

```
<!-- login modal -->
    <div class="modal fade" id="loginModal" tabindex="-1" role="dialog" aria-
labelledby="exampleModalLabel"
        aria-hidden="true">
        <div class="modal-dialog" role="document">
            <div class="modal-content">
                <div class="modal-header ">
                    <h5 class="modal-title mx-auto " id="exampleModalLabel">Login Form</h5>
                    <button type="button" class="close" data-dismiss="modal" aria-
label="Close"> <span
                            aria-hidden="true">&times;</span> </button>
                </div>
                <div class="modal-body col-sm-8 mx-auto">
                    <!--  -->
                    <form method="POST" autocomplete="">
                        <p class="text-center">Login with your username and password.</p>
                        <!-- alert -->
                        <p class="errormessage" id="loginErr">
                            <?php echo $loginErr; ?>
                        </p>
                        <!--  -->
                        <div class="form-group">
                            <input class="form-control" type="text" name="username"
placeholder="Username">
                        </div>
```

```
                        <div class="form-group">
                            <input class="form-control" type="password" name="password"
placeholder="Password" required>
                        </div>
                        <div class="link forget-pass text-left"> <a
                                href="<?php echo $_SESSION['baseurl'];
?>public/main/forgotpassword">Forgot username or
                                password?</a></div>
                        <div class="form-group">
                            <input class="btn btn-primary btn-block " type="submit"
name="login_btn"
                                style="background-color: #6665ee;">
                        </div>
                        <div class="link login-link text-center">Not yet a member?
                            <br /> <a href="signup/serviceprovider" style="text-decoration:
underline;">Signup now as
                                service provider </a>
                        </div>
                        <div class="link login-link text-center " style="margin-top:-30px;text-
decoration: underline;">
                            <br />
                            <a href="signup/serviceseeker">Signup now as service seeker</a>
                        </div>
                    </form>
                    <!--  -->
                </div>
            </div>
        </div>
    </div>
    <!--/login modal  -->
```