



**TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
THAPATHALI CAMPUS**

**Proposal On :
Theater Management System**

Submitted by:

Saugat Pokhrel (THA081BEI036)

Sparsh Bashyal (THA081BEI044)

Shikshit Bhattarai (THA081BEI039)

Yogesh Aryal (THA081BEI048)

Submitted to:

Department of Electronics and Computer Engineering
Thapathali Campus
Kathmandu, Nepal

February, 2025

ABSTRACT

This project aims to develop a Theater Management System using the C programming language. The system will provide a console-based interface for managing theater operations, including ticket booking, seat management, movie scheduling, and customer management. The system will be designed to handle multiple screens, showtimes, and ticket pricing, ensuring a smooth and efficient experience for both customers and theater staff. The project will focus on creating a robust and efficient system using C, leveraging its low-level capabilities for performance and reliability.

Keywords: Theater Management, Console-based System, Seat Management, Ticket Booking, Movie Screening

Table of Contents:

ABSTRACT.....	i
Table of Contents:	ii
Table of Figures:.....	iii
List of Abbreviations.....	iv
1.1 Background Introduction.....	1
1.2 Motivation.....	1
1.3 Problem Definition	1
1.4 Objectives.....	2
1.5 Scope and Applications	2
3. PROPOSED SYSTEM ARCHITECTURE.....	5
3.1 Block Diagram or System Architecture	5
3.3 Tools and Environment	9
4. METHODOLOGY	10
5. SCOPE AND APPLICATIONS.....	11
6. TIME ESTIMATION.....	12
7. FEASIBILITY ANALYSIS.....	13
7.1)Practical Use of Theatre Management System	13
a) User login page	13
b) Film selection.....	14
c) Seat booking.....	15
d)Admin page.....	15
7.2)Financial feasibility of Theatre Management System.....	16
Development Costs:	16
Revenue Generation:	17
3)Complexity and Challenges.....	17
7.4)Conclusion	18
REFERENCES:.....	19

Table of Figures:

Fig 3-1: Block Diagram of Entry Point	5
Fig 3-2 Admin Interface	6
Fig 3-2 User Interface	7

List of Abbreviations

TMS: Theater Management System

1. INTRODUCTION

1.1 Background Introduction

The entertainment industry, particularly the movie theater business, has seen significant growth over the years. With the increasing number of moviegoers, managing theater operations manually has become inefficient and error-prone. The need for an automated system to handle ticket bookings, seat management, and movie scheduling is more critical than ever. A TMS aims to address these challenges by providing a centralized platform for managing all theater operations. This project will implement the system using the C programming language, leveraging its efficiency and low-level control.

1.2 Motivation

The motivation behind this project is to simplify the complex processes involved in managing a movie theater. By automating tasks such as ticket booking, seat allocation, and movie scheduling, theater staff can focus more on providing excellent customer service rather than dealing with administrative tasks. Additionally, customers will benefit from a seamless booking experience, reducing wait times and improving overall satisfaction. Using C ensures that the system is efficient, fast, and reliable, even with large amounts of data.

1.3 Problem Definition

The current manual processes for managing theater operations are time-consuming and prone to errors. Customers often face long queues, and theater staff struggle to manage multiple tasks simultaneously. The proposed Theater Management System aims to automate these processes, providing a more efficient and user-friendly solution for both customers and theater staff. The system will be implemented in C, ensuring high performance and reliability.

1.4 Objectives

The main objectives of our project are listed below

To develop a console-based Theater Management System in C that automates ticket booking, seat management, and movie scheduling.

To provide an intuitive user interface for both customers and theater staff.

1.5 Scope and Applications

The proposed system can be used in: Movie theaters to manage daily operations efficiently. Small to medium-sized theaters that require a lightweight and efficient system. Educational institutions for teaching C programming and system design

2. LITERATURE REVIEW

A Theater Management System (TMS) is a comprehensive software solution designed to streamline the multifaceted operations of theaters, encompassing movie scheduling, screen assignments, ticket reservations, and ticket printing. By integrating these functions, a TMS enhances efficiency and improves the overall management of theater activities. The missions of a TMS mean that it will be connected to at least all of the cinema's reading servers. This therefore makes it a natural supervision tool. It happens that some TMS integrate with the cinema's cash register system or even the advertising management system.[1]

Core Functions of a Theater Management System:

1. **Content Management:** TMS platforms manage Digital Cinema Packages (DCPs), including films, trailers, teasers, and advertisements. This ensures that all media content is organized and readily accessible for scheduled screenings.
2. **Show Scheduling:** The system facilitates the planning and scheduling of movie showtimes, allowing managers to allocate films to specific screens and times efficiently. This aids in optimizing screen utilization and meeting audience demand.
3. **Key Delivery Message (KDM) Management:** TMS handles the distribution and management of KDMs, which are essential for decrypting and playing encrypted digital films. Proper KDM management ensures that only authorized screens can display the content during designated times.
4. **Ticketing and Reservations:** Modern TMS solutions often integrate ticketing functionalities, enabling online and on-site ticket sales, seat reservations, and real-time availability updates. This integration enhances the customer experience by providing convenient booking options.
5. **Resource Allocation:** Beyond scheduling, TMS assists in managing theater resources such as seating arrangements, ensuring optimal utilization and adherence to safety protocols.

Benefits of Implementing a Theater Management System:

- **Operational Efficiency:** By automating routine tasks, TMS reduces manual labor, minimizes errors, and allows staff to focus on enhancing customer service.
- **Enhanced Customer Experience:** Features like online booking, seat selection, and timely information updates improve the patron's experience, leading to increased satisfaction and loyalty.
- **Data-Driven Decision Making:** TMS provides valuable insights through data analytics, helping managers make informed decisions regarding scheduling, marketing strategies, and resource allocation.

Challenges and Considerations:

While TMS offers numerous advantages, theaters must consider factors such as system integration with existing infrastructure, staff training, and data security. Selecting a system that aligns with the theater's specific needs and scale is crucial for maximizing the benefits of TMS implementation.

In conclusion, a Theater Management System serves as a pivotal tool in modern cinema operations, offering a centralized platform to manage various aspects of theater management efficiently. Its integration into theater operations not only streamlines processes but also enhances the overall experience for both staff and patrons.

3. PROPOSED SYSTEM ARCHITECTURE

3.1 Block Diagram or System Architecture

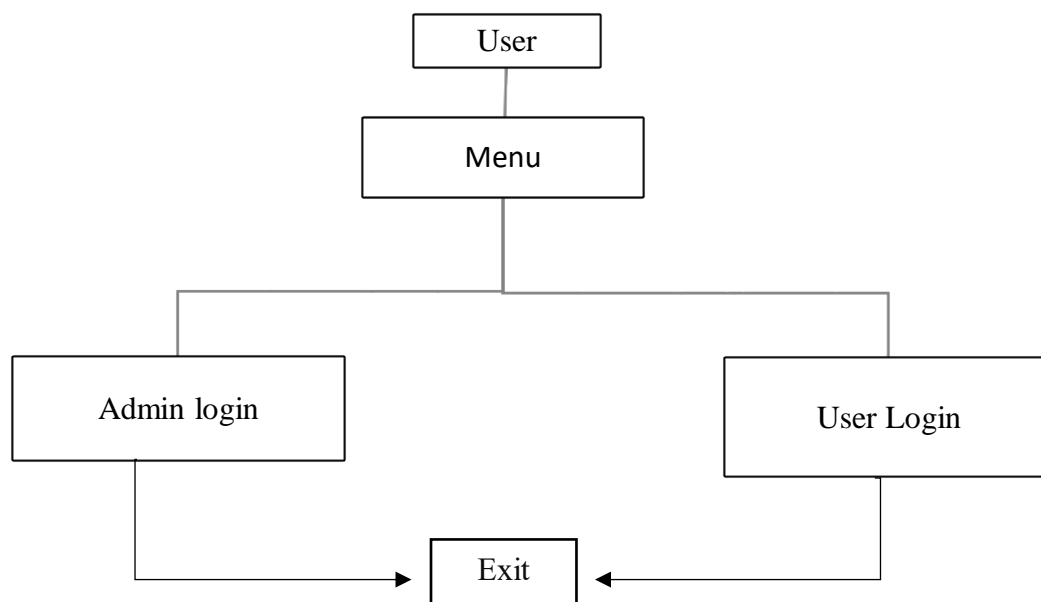


Fig 3-1: Block Diagram of Entry Point

3.2 Parts of the Program

3.2.1 Menu

The home page of the application has the title “Theater Management System” and the menu which shows login and create account and the users privilege will be checked in program and access will be given accordingly

3.2.1.1 Admin Login

The admin login menu requires the admin login credentials which should be filled up by the respective admin to do the activities related to theater. The activities can be selected from the menu presented.

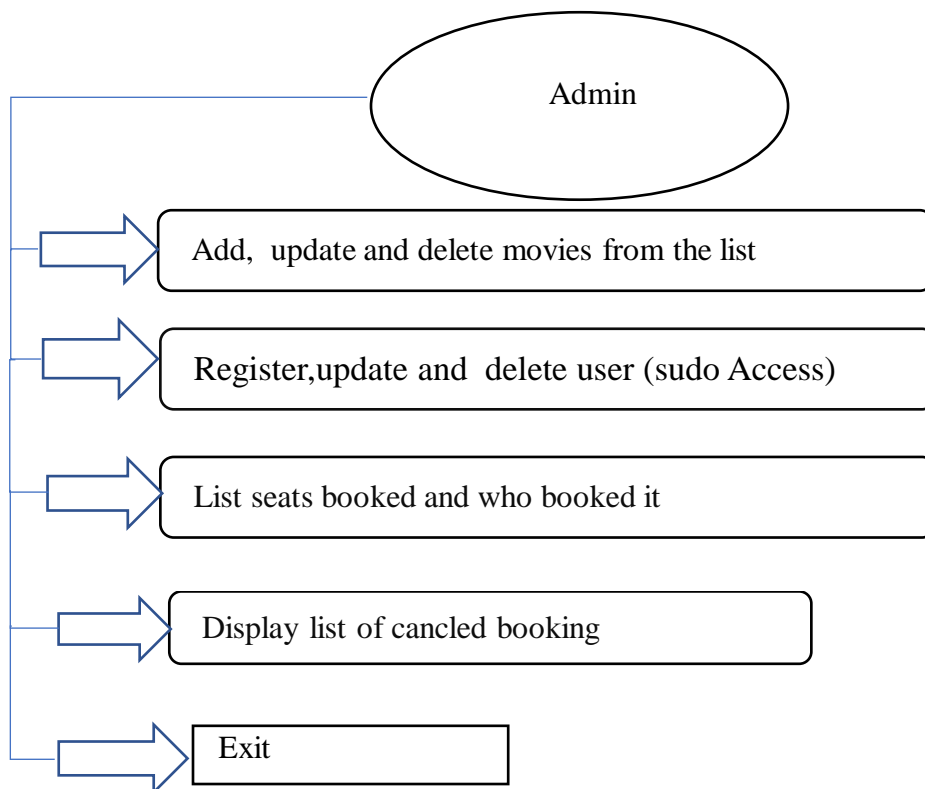


Figure 3-2 Admin Interface

3.2.1.2 User login

The user can see the movies that are being shown and will be shown in the future. And book seat's accordingly.

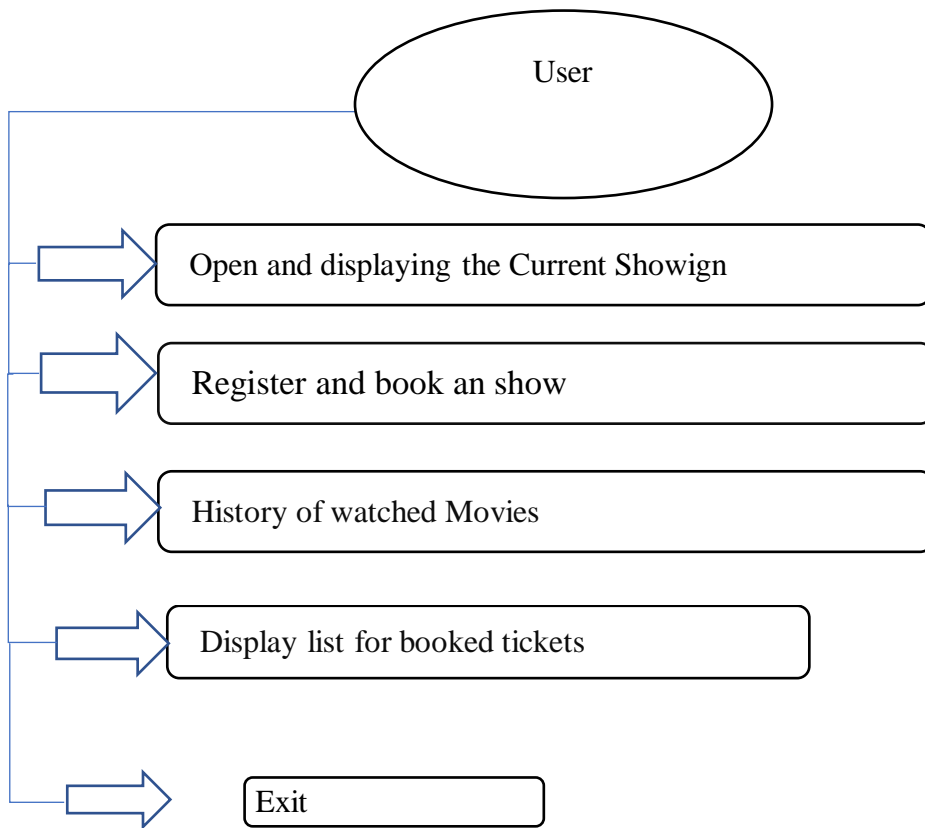


Figure 3-3: User Interface

FUNCTIONAL/NON-FUNCTIONAL REQUIREMENTS

The functional requirements of the system are:

- All users and administrators necessity be capable to register in the structure of system by giving the appropriate information.
- Double-check that you wish to log in to the user by entering valid information.
- The system must be capable of booking a movie ticket on a specific date.
- The system must allow the user to compare ticket prices and wait times. • The system must allow the user to watch movies by category.
- To add, amend, or delete a cinema, the system must be administered.
- Manage the films by adding, editing, and deleting them.
- Administrators can be added, edited, or deleted.
- The system administrator must be capable to display the number of recorded

Consumers[2]

3.3 Tools and Environment

During the making of the whole project, many tools were used as listed below:

3.3.1 Development Tools Used

- **GitHub:** It is a proprietary developer platform that allows developers to create, store, manage, and share their code. It uses Git to provide distributed version control and GitHub itself provides access control, bug tracking, software feature requests, task management, continuous integration, and wikis for every project.
- **Visual Studio Code:** It is an integrated development environment developed by Microsoft for Windows, Linux, macOS and web browsers. Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded version control with Git. Users can change the theme, keyboard shortcuts, preferences, and install extensions that add functionality.

.

4. METHODOLOGY

In our project we used various ways to gather our data and analyze the relevant topics covering the area of file handling, header files and arrays.

4.1 Header Files and Namespaces

Header files contains set of predefined library functions. In this project, we have used several header files as per convenience that are listed below:

1. string.h
2. stdio.h
3. conio.h

4.2 Functions and Conditional Statements

Functions are used in integral part of this project development. Most of the activity that are presented in the software heavily relies on functions and the inputs that are given from the user using this particular application.

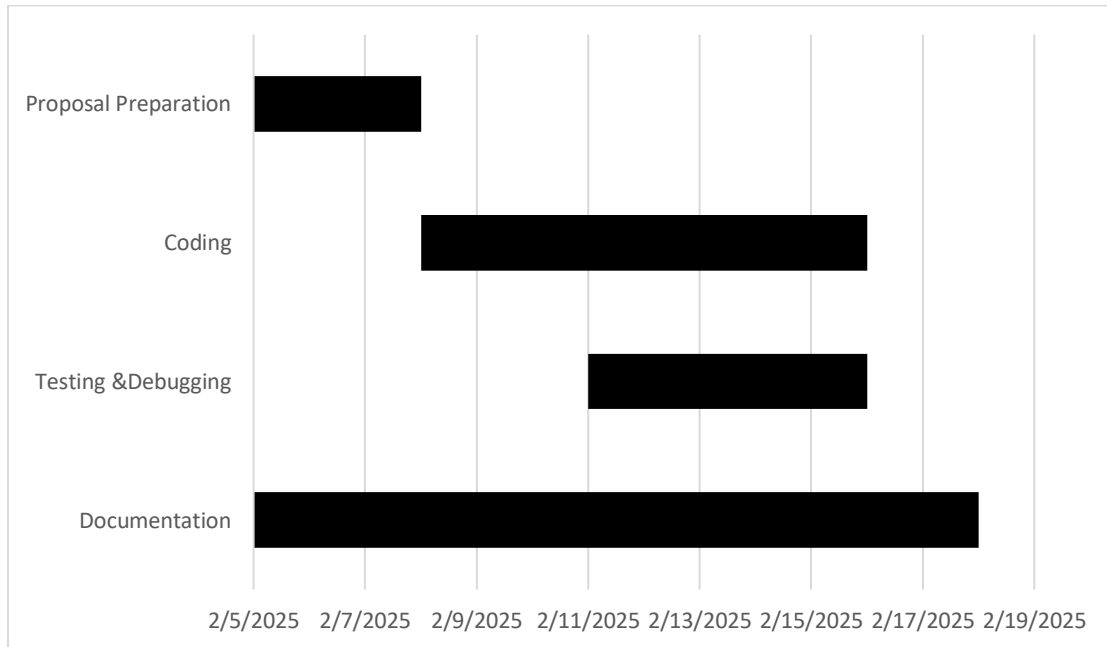
Likewise, conditional statements are also profoundly used in this application. The required data which is an absolute must and conform to the title that is supposed to be stored is how we can store the necessary data. The application becomes efficient and correct as we can filter what actual data is presented in the input with the help of conditional statements.

5. SCOPE AND APPLICATIONS

Scope and Applications list:

- Ticket Booking
- Seat Management
- Movie Scheduling
- Customer Relationship Management
- Resource Management
- Security Management

6. TIME ESTIMATION



7. FEASIBILITY ANALYSIS

The purpose of this feasibility study is to evaluate the possibility of developing a Theatre Management System (TMS) using the C programming language . The study will focus on the practical use , operational cost and challenges and complexity. Theatre management involves a wide range of tasks ,including user login page ,film selection , seat booking and admin page .

7.1)Practical Use of Theatre Management System

A Theatre Management System (TMS) built using the C- programming language can be used practically in a variety of ways, benefitting both theatre staff and

customers. Here's a breakdown of how it can be applied effectively in real-world theatre operations.

a) User login page

The User Login Page is designed for customers to create accounts, log in, and access personalized features such as film selection and seat booking.

Practical Use:

User Authentication: Customers must log in with a username and password to access the full functionality of the system, ensuring that their information is secure. If they do not have an account, they can easily sign up and create one.

Security and Privacy: The login system ensures that personal data

such as contact information, payment details, and booking history are securely stored and protected, giving users confidence in using the system.

The User Login Page enhances the customer experience by offering personalized features, maintaining security, and providing easy access to future bookings.

b) Film selection

The film selection feature allows users to select the ongoing movies . The user must click the movies which they want to watch and film details like rating ,genre, showtime etc. We can also select the movie timing through this page .

Practical Use:

- **Select Movies:** Users can see a list of available films or performances, which may include posters, descriptions, trailers, and ratings. This helps customers make an informed decision about which show they wish to attend.
- **Show Timings:** For each movie, users can view the available showtimes (e.g., 1:00 PM, 4:00 PM, 7:00 PM) and pick a time that fits their schedule.
- **Film Categories:** The films might be categorized based on genre (e.g., action, comedy, drama), language, or rating, allowing users to filter and select movies that interest them the most.

The Film Selection feature simplifies the process of browsing and choosing movies, helping customers decide what to watch quickly and easily.

c) Seat booking

The Seat Booking feature allows users to choose their preferred seats for a specific show. It ensures that users can visually select seats from the available options and reserve them in real-time.

Practical Use:

Interactive Seat Map: After selecting a movie and showtime, the user is presented with an interactive seat map that shows the available seats (e.g., green for available, red for booked). The user can click on seats to select them.

Booking Summary: Once the seats are selected, the user is shown a booking summary that includes the movie details, showtime, number of tickets, and total price. Users can then confirm the booking and proceed to payment.

The Seat Booking feature allows users to easily select and reserve seats, enhancing convenience and providing greater control over their movie experience.

d) Admin page

The Admin Page is designed for theatre managers or administrators to control and manage the entire system. It is a powerful interface that provides administrative control over various aspects of the theatre's operations.

Practical Use:

Manage Films/Shows: Admins can add, update, or remove films or performances. For example, when a new movie is released, the admin can enter the details, including the name, duration, genre, and showtimes. Admins can also update showtimes for existing films (e.g.,

add an evening show or change the time due to unforeseen circumstances).

Schedule Shows: The admin can create and modify show schedules.

This includes choosing the date and time for each film or play, as well as assigning it to specific theatres or auditoriums.

Manage Ticket Pricing: Admins can set and adjust ticket prices based on factors like film type, time of day (e.g., discounts for matinee shows), and special promotions.

In practice, the Admin Page acts as the central hub for managing the theatre's day-to-day operations and making data-driven decisions.

7.2)Financial feasibility of Theatre Management System

The financial feasibility of a Theatre Management System (TMS) is essential to determine whether the system can generate enough returns on investment (ROI) to justify its development and operational costs. A successful TMS should not only streamline theatre operations but also lead to cost savings, increased revenue, and improved customer satisfaction. Below is a detailed breakdown of the financial aspects of developing and operating a TMS, highlighting key cost factors, potential revenue generation, and the overall financial benefits.

Development Costs:

Personnel: Hiring C developers, project managers, and quality assurance testers.

Hardware: Servers and personal computers for theatre staff to access the system.

Software: No additional software costs, as C and related tools are

open-source and free.

Revenue Generation:

Cost Savings: Automating manual processes such as ticket sales and seat management will lead to time and labor savings.

Improved Customer Experience: A user-friendly system will attract more customers, leading to higher ticket sales.

Reports: Detailed reports can help in marketing strategies, improving occupancy rates, and optimizing ticket pricing.

Ongoing Costs:

Maintenance: Regular updates and bug fixes to ensure system stability.

Hardware Upgrades: Future scalability will require additional server or client machine upgrades.

C is a low-level programming language that offers great performance but requires a careful cost-benefit analysis, especially when compared to higher-level languages.

3)Complexity and Challenges

The complexity of developing Theatre Management System Using C language is listed below:

Performance Issues: Handling large volumes of concurrent users and transactions might affect performance, especially with C's low-level nature.

Data Integrity: Maintaining data consistency, especially with file-based databases, could be challenging.

Complexity in User Interface: A text-based interface may not be intuitive for all users, requiring additional training.

Security: Protecting customer information, such as payment details, may require encryption mechanisms, which could be complex in C.

7.4) Conclusion

After evaluating the practical ,financial aspects, the development of a Theatre Management System using C is feasible. The system has the potential to improve operational efficiency, enhance customer satisfaction, and reduce costs. However, attention must be given to potential performance and data integrity challenges. With proper planning, resource allocation, and risk management, this project can be successfully implemented.

REFERENCES:

- [1] Wikimedia, "Theater Management System," Wikipedia.org, Apr. 21, 2011.
https://fr.wikipedia.org/wiki/Theater_Management_System (accessed Feb. 07, 2025)
- [2] K. Acharya, "A CASE STUDY ON ONLINE TICKET BOOKING SYSTEM PROJECT," *SSRN Electronic Journal*, 2024, doi: <https://doi.org/10.2139/ssrn.4841210>.