Theater Booking and Management System

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Batch: 5.2

Group Number: ITP24J_B05_16

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Background

The Client is a theater management company overseeing several cinema locations. They handle movie schedules, ticket booking, and customer interactions. Currently, their operations depend on an outdated system that requires a lot of manual work. This outdated system led to long wait times for customers, difficulties in maintaining accurate schedule, and challenges in effectively managing customer feedback.

Furthermore, the current system cannot provide real-time updates or data analytics which are crucial for making informed business decisions. Recognizing these inefficiencies, the client sees the need for a modern, integrated system to improve their operations. This project aims to develop a comprehensive Theater Booking and management system to streamline processes, enhance customer satisfaction, and help the company stay competitive in the entertainment industry.

Problem and Motivation

Following a comprehensive requirement gathering process, several analytical challenges have emerged within the current theater booking management system. One notable drawback is the absence of an online platform, which denies users the advantages of digital interactions. The system currently relies on manual procedures for essential functions such as user management, resource and maintenance management, staff coordination, Customer Engagement management, movie management, ticket Booking and payment management. This reliance on manual processes adds complexity and hinders the system's efficiency and operational effectiveness. Furthermore, users face additional stress due to the inability to manage these tasks efficiently.

User Management

Theater management faces significant challenges in key areas such as registration, membership, and user profiles. Manual registration processes lead to delays and inaccuracies in personal data entry. Handling memberships manually adds complexity to renewals, and there are difficulties in updating user profiles and ensuring accessibility. These issues adversely affect the overall user experience and satisfaction.

Movie Management

The current theatre management system faces several specific problems when it comes to movie management. Manual tracking and updating of film schedules create inefficient operational workflows, requiring customers to physically visit the venue or call to check the schedules. Additionally, promoting films presents another challenge. Without an online presence, the cinema relies solely on traditional methods for advertising, such as posters.

Ticket Booking Management

The current theater management system faces several issues in ticket booking management. Manual handling of ticket reservations introduces inefficiencies into the workflow. Additionally, film search functionalities often lack optimization, making it difficult for users to find and select their preferred films easily.

Payment Management

Managing payments manually for membership and ticket purchasing within the current theater management system presents significant challenges for both customers and staff. Manual processing of membership payments and ticket purchases can lead to delays and difficulties in maintaining accurate financial records, increasing the risk of errors. This manual approach adversely affects customer satisfaction.

Maintenance Management

The maintenance management component within the current theater management system presents significant challenges due to its reliance on manual processes. This approach makes it difficult to track and manage resource usage effectively. Additionally, the lack of automated systems hampers the quick identification and resolution of maintenance issues, increasing the risk of equipment failures and facility shortages.

Staff Management

Managing leave evaluations and salary processes manually within the current theater management system poses significant challenges. Manual leave evaluation can lead to delays in processing employee leave requests, negatively impacting employee satisfaction. Additionally, handling salaries, including allowances and overtime payments, manually increases the chances of inaccuracies in financial records and calculations.

Customer Engagement Management

The current theater management system struggles with customer engagement due to manual processes. Handling interactions and feedback manually leads to inefficiencies and delays, making it hard to track preferences and address concerns quickly. Without a streamlined system for collecting and analyzing feedback, improving services and ensuring customer satisfaction is challenging. This negatively impacts the overall customer experience and limits opportunities for building positive relationships with patrons.

Report and Analytics Management

The current theater management system struggles with report and analytics management due to manual processes. Creating and analyzing monthly financial, staff, and inventory reports manually is time-consuming and error-prone. Without automated analytics tools, making data-driven decisions is difficult, impacting the theater's efficiency and strategic planning, and limiting performance optimization and trend identification.

Motivation

In the era of technological advancement, many companies are actively collaborating with various technologies to enhance productivity, reduce workforce requirements, optimize costs, reach a broader audience, and save time. The decision to develop a modern Theater Booking and Management System is driven by the need to address current challenges faced by the clients. Automation will benefit both customers and staff by streamlining processes and improving efficiency.

Customers will enjoy the convenience of efficient user registration, membership management, and profile updates, along with enhanced customer interaction. Staff management will become more dynamic, reducing manual efforts in managing staff relations. Facility and maintenance management will improve with better inventory tracking, reducing time and risk. Film management will benefit from a well-organized and easily updatable platform, enhancing the cinema experience.

Ticket booking will become a convenient and flexible function for customers. Moreover, an online payment management system will simplify financial transactions, providing a secure and efficient way for clients to manage their membership and ticket purchases. Overall, this enhancement aims to deliver user-friendly, efficient, and enjoyable experiences, ultimately increasing customer satisfaction.

Aims and Objectives

Aims

The aim of the Theater Booking and Management System is to provide a systematic and comprehensive platform for administrators and managers to efficiently handle their tasks. This user-friendly platform aims to streamline movie scheduling, ticket bookings, customer engagement, and staff coordination, enhancing the overall theater experience.

Enhanced User Experience: The system aims to offer an enjoyable experience for users by providing intuitive and user-friendly interfaces for browsing movies, booking tickets, and ensuring smooth communication between users and management. It focuses on creating a user-centric platform that simplifies access, tracks customer details, and streamlines booking processes.

Efficient Movie Management: To enable theater staff to schedule and manage a variety of movies effectively, ensuring safer and more accessible movie-going experiences.

Promotion of Entertainment and Well-being: A significant aim is to offer a diverse range of movies and entertainment options that cater to different interests, contributing to the overall satisfaction and enjoyment of the community.

Performance Monitoring and Improvement: By monitoring user engagement, satisfaction levels, and feedback, the system helps identify areas for improvement and guides managers in making necessary decisions to enhance customer satisfaction.

Optimized Resource Allocation: The key aim is to efficiently manage resources such as equipment and facilities to ensure smooth operations and maximum utilization. The system aims to track all equipment, schedule maintenance tasks, and reorder supplies when necessary.

Professional Development: The company aims to provide opportunities for staff members to enhance their skills and knowledge, fostering professional growth and career advancement within the organization. The system should support teamwork and communication among employees, storing employee details and providing necessary facilities.

Financial Management: To automate billing processes, manage membership plans, track payments and balances, and generate financial reports, ensuring accurate and efficient financial operations.

Objectives

Based on the requirements and aims of the Theater Booking and Management System, the following objectives have been identified:

Develop a User-Friendly Interface: Create an intuitive platform for browsing movies, booking tickets, tracking customer information, and processing payments efficiently.

Efficient Movie Scheduling and Management: Facilitate easy scheduling and management of a variety of movies, ensuring safety and accessibility for all users.

Diverse Entertainment Options: Offer a wide range of movies and entertainment activities to cater to different interests, promoting overall satisfaction and enjoyment.

Monitor Satisfaction Levels: Implement mechanisms to track customer satisfaction and gather feedback to identify areas for improvement.

Efficient Resource Management: Ensure all equipment is managed effectively and monitored for maintenance needs, with alerts for necessary repairs.

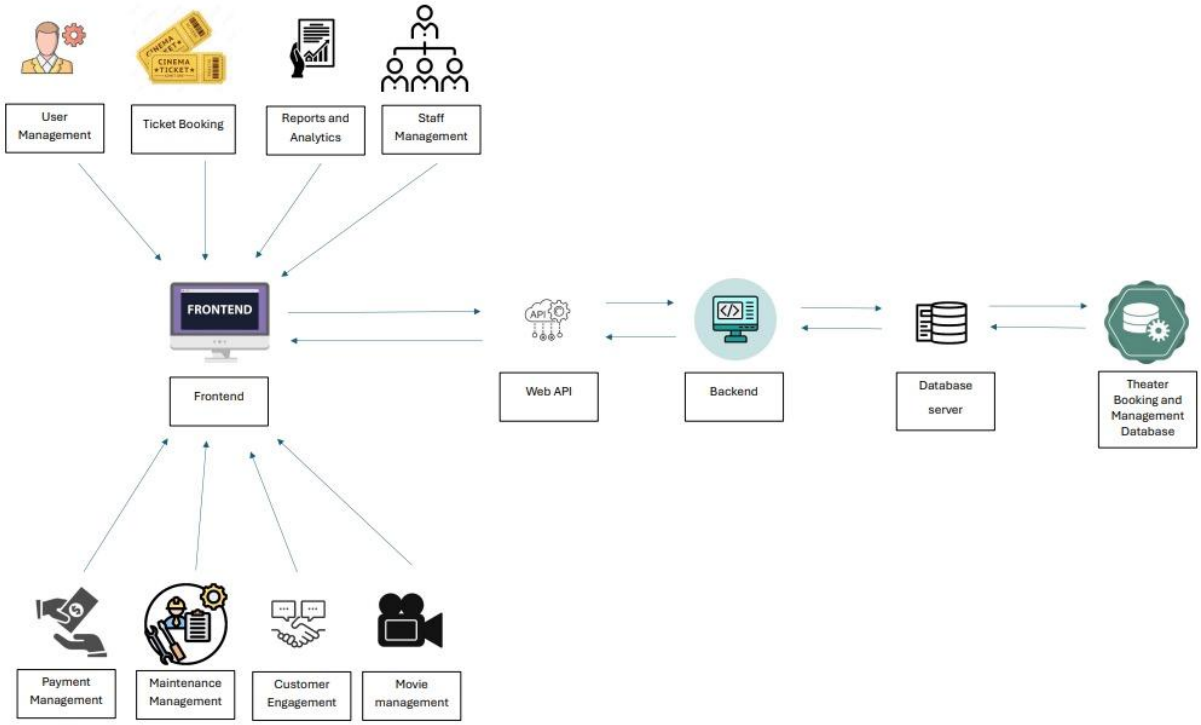
Streamlined Staff Management: Enable quick and easy access to employee data, allowing managers to input and retrieve staff information as needed.

Financial Tracking and Reporting: Develop features to record all financial transactions and generate comprehensive financial reports to monitor the financial health of the theater.

Enhance Operational Effectiveness: Improve overall operational efficiency, enhance customer experiences, and increase revenue and profitability through the implementation of the system.

System Overview

We divided our system in to 8 components (or subsystems) as user management, movie management, ticket booking function, Customer Engagement management, Report and Analytics management, maintenance management, staff management, payment management. All the above-mentioned components are connected to the front end of the system. Web API is going to be implemented using Rest API along with Express JS [7]. Web API acts as the bridge that connects the front end and back end of the system. The backend of the system is going to be implemented using Node JS [8]. The process of backend is going to be implemented using the data collected by Json objects which are retrieved from MongoDB. MongoDB is the database server of the system [9]. All the records and data of the system are going to be stored in the Theater Booking and Management database. The system is going to be hosted in external storage



Functional requirements

Ticket Booking function

The Theater Booking and Management System provides users with an intuitive interface to explore and select from a comprehensive listing of events and activities. Once an event is chosen, users can conveniently pick specific show times, specify the desired number of tickets, and select preferred seat positions. If tickets are unavailable for a chosen show time, the system promptly sends an unavailability message.

Users can easily add their preferred event reservations to a cart. The system offers customization options, such as the ability to remove reservations or change the quantity of tickets in the cart. This function ensures a smooth and effective booking experience by automatically calculating the entire cost based on the specified bookings, thus enhancing customer convenience.

User Management

The User Management section is designed to facilitate user engagement with the 'Theater Booking and Management System,' offering distinct functionalities for two main user categories: Unregistered Users and Registered Users (Members). The aim is to provide a seamless and user-friendly experience for individuals interacting with the system.

Unregistered Users

- Access is primarily centered around movie ticket booking functionality.
- They can initiate their journey by creating an account, providing essential details such as name, email, username, and a preferred password.
- They are prompted to select their desired membership type for the Theater Management System and proceed to make membership payments.
- Once registered, users can log in using their chosen username and password, gaining access to an array of account management features, including the ability to edit and delete account details.

Registered Users (Members)

- Enjoy comprehensive access to all features within the system, encompassing both movie booking and activity management.

- The user profile serves as a central hub, offering insights into booked movies, activities, and the details of their chosen membership plan.
- Registered users can book movies, engage in activities, and manage games.

Regardless of user status, individuals can interact with the system through the website, engaging in activities such as sending inquiries.

In Summary:

The User Management section empowers users to seamlessly navigate the 'Theater Booking and Management System,' ensuring a tailored experience based on their registration status. From account creation to membership management, the system provides a holistic platform for users to engage with the diverse offerings of movie and activity management.

Movie management function

The Movie Management Function is a critical component of the 'Theater Booking and Management System,' ensuring a well-organized and up-to-date movie selection process. This function enhances the overall movie-going experience for both theater staff and customers. The main users involved with this function are the Movie Manager and the Customers.

For the Movie Manager:

- **Add New Movies:** The movie manager can add new movies to the system, capturing details such as movie title, genre, duration, main actors and actresses, and release date.
- **Modify and Update Information:** The movie manager can modify and update movie information to keep the database accurate and relevant.
- **Remove Movies:** The movie manager can remove movies from the list when they are no longer being screened.
- **Movie Show Times and Scheduling:**

  Manage the scheduling of movie show times, ensuring efficient scheduling and synchronization to avoid overlapping screenings and potential conflicts.

  Modify show time details such as date or movie as required.

  Remove a scheduled movie from the system when necessary, including the ability to cancel a show time due to technical issues or maintenance.

For the Customers:

- **View Movies:** Customers can view movies added to the system, displayed in two categories: ongoing movies and upcoming movies. Additionally, movies are categorized by genre, such as action, romance, horror, comedy, children's movies, adventure, etc.
- **Explore and Select Show Times:** Customers can explore the available movie list and pick their preferred show times. The show time list displays options for each day when a date is chosen from the calendar.
- **Reports:** The system generates reports about the movies added and how many times they are screened.

By streamlining movie selection and show time scheduling, the system enhances convenience, efficiency, and overall satisfaction, ultimately contributing to the success of the business.

Customer Engagement Management

1. **User Registration and Profile Management**

- **Account Creation:** Users can create an account by providing essential details such as name, email, username, and password.
- **Profile Editing:** Users can edit their profile information, including personal details and contact information.
- **Password Management:** Users can reset or change their password.
- **Membership Selection:** Users can select and manage their membership type.

2. **Communication and Feedback**

- **Inquiry Submission:** Users can submit inquiries or feedback through a contact form.
- **Response Management:** The system allows administrators to respond to user inquiries and manage communication history.
- **Notifications:** The system sends notifications to users for important updates, booking confirmations, and promotional offers.

3. **Loyalty Programs and Rewards**

- **Points Accumulation:** Users can accumulate loyalty points based on their bookings and interactions with the system.
- **Redeem Points:** Users can redeem accumulated points for discounts or free tickets.
- **Reward Notifications:** The system notifies users about their points status and available rewards.

4. **Event Participation and Engagement**

- **Activity Booking:** Users can book various activities and events besides movie screenings.
- **Event Calendar:** The system provides a calendar view of upcoming events and activities.
- **Participation History:** Users can view their history of booked activities and events.

5. **Surveys and Polls**

- **Survey Distribution:** The system can send surveys to users to gather feedback on their experiences.
- **Poll Participation:** Users can participate in polls related to theater events and services.
- **Result Viewing:** Users can view results of surveys and polls they participated in.

6. **Personalized Recommendations**

- **Movie and Event Suggestions:** The system provides personalized recommendations based on user preferences and booking history.
- **Custom Notifications:** Users receive custom notifications about new movies and events that match their interests.

7. **Social Media Integration**

- **Social Sharing:** Users can share their booked events and activities on social media platforms.
- **Social Login:** Users can log in using their social media accounts for a streamlined registration process.

8. **Analytics and Reporting**

- **User Engagement Reports:** The system generates reports on user engagement metrics, such as active users, frequent bookers, and feedback received.

- **Activity Participation Reports:** The system provides insights into participation rates for different activities and events.
- **Loyalty Program Analysis:** The system analyzes the effectiveness of loyalty programs and user redemption patterns.

These functional requirements ensure that the Customer Engagement Management function provides a comprehensive and interactive experience for users, fostering loyalty and satisfaction while enabling the theater management to effectively manage and enhance customer relationships.

Maintenance Management

The Maintenance Management function within the "Theater Booking and Management System" is a critical component that enables administrators to efficiently manage inventory items, schedule maintenance tasks, and ensure the smooth operation of theater facilities.

Inventory Management

- **Add Inventory Items:** Administrators can log in to a user-friendly dashboard to add new inventory items such as theater equipment, sports equipment, and activity equipment. Each inventory item is associated with relevant information such as item name, description, quantity, price, status, and maintenance schedule.
- **Update and Delete Items:** Administrators can provide a detailed list of all inventory items, update information, and delete outdated or unused items to maintain an accurate inventory record.
- **Search and Filter:** A search function allows administrators to filter and retrieve specific inventory items based on various criteria such as item name, category, and status, enabling quick access to required items without manual browsing.
- **Notifications:** The system notifies administrators about the total number of inventory items available, the total amount of money spent on equipment, items with low inventory levels, and upcoming maintenance tasks.
- **Re-order Level Notifications:** When a resource reaches the re-order level, the system sends a notification to the administrator, who can then email suppliers to request the necessary resources.
- **Monthly Reports:** The system generates monthly reports to track inventory levels, which can be printed if needed.

Maintenance Management

- **Schedule Maintenance Tasks:** Administrators can schedule new maintenance tasks, display upcoming maintenance tasks, and edit maintenance details.
- **Update and Remove Tasks:** Administrators can update issue statuses, remove completed tasks, and delete issue logs.
- **Track Maintenance Details:** Maintenance details such as task descriptions, schedules, and completion statuses are easily tracked and used for monitoring purposes.
- **Facility Maintenance:** This includes cleaning routines, repairs, and inspections to keep the premises in good condition.

User Access

- **View Facilities and Resources:** Users can view all the facilities and resources provided by the system, ensuring transparency and better resource utilization.

By integrating these functionalities, the Resource and Maintenance Management function enhances operational efficiency, maintains accurate inventory records, and ensures the proper upkeep of theater facilities, contributing to a seamless and enjoyable experience for both administrators and users.

Reports and Analytics Management

The Reports and Analytics Management function in the Theater Booking and Management System is designed to provide comprehensive insights into the operational aspects of the theater. It enables administrators and managers to generate, view, and analyze various reports to improve decision-making and operational efficiency. Below are the functional requirements for this function:

1. Report Generation

- **Types of Reports:** The system should support the generation of various types of reports, including but not limited to:
    - **Sales Reports:** Total ticket sales, revenue generated, and breakdowns by movie, time, or date.
    - **Booking Reports:** Number of bookings per show, booking trends over time, and booking cancellations.

- **Inventory Reports:** Status of inventory items, including quantity, usage, and expenditures.
- **Customer Reports:** Customer demographics, booking history, and membership statistics.
- **Performance Reports:** Movie performance metrics, such as attendance rates, peak times, and customer feedback.
- **Operational Reports:** Maintenance schedules, facility usage, and staff performance.

- **Report Customization:** Users should be able to customize reports by selecting specific criteria such as date ranges, movie titles, show times, and more.
- **Export Options:** Reports should be exportable in various formats, including PDF, Excel, and CSV.

2. Analytics Dashboard

- **Visualization Tools:** Provide graphical representations of data such as charts, graphs, and tables for easier analysis.
- **Key Performance Indicators (KPIs):** Display KPIs relevant to theater operations, such as occupancy rates, revenue trends, and customer satisfaction scores.
- **Real-Time Data:** Display real-time analytics for current performance metrics, including ongoing sales and bookings.

3. Data Access and Security

- **Access Controls:** Implement role-based access controls to ensure that only authorized personnel can generate and view specific reports.
- **Data Security:** Ensure that all data within reports and analytics is protected through encryption and secure access protocols.

4. Automated Reporting

- **Scheduled Reports:** Allow users to schedule automatic generation and distribution of reports at specified intervals (e.g., daily, weekly, monthly).

- **Alerts and Notifications:** Send alerts and notifications to users based on specific report triggers or thresholds (e.g., low inventory levels, high cancellation rates).

5. Historical Data Analysis

- **Historical Data Access:** Provide access to historical data for trend analysis and comparison with current data.
- **Comparative Analysis:** Enable users to compare data across different periods, such as year-over-year or month-over-month performance.

6. User Interface

- **Intuitive Design:** Ensure the user interface for report generation and analytics is user-friendly and easy to navigate.
- **Search and Filter:** Implement search and filter options to allow users to quickly find and analyze specific data points.

By implementing these requirements, the Reports and Analytics Management function will help in making data-driven decisions, optimizing operations, and enhancing overall management of the theater booking system.

Payment Management

The **Payment Management** function for the Theater Booking and Management System handles user payments related to both movie ticket reservations and membership payments. It ensures smooth transactions and maintains customer satisfaction through secure and efficient payment processes.

Payment for Movie Reservations

- **Payment Details Management:**
    - Customers can securely update their payment details, including saving, reviewing, and deleting payment information.
    - Payment details stored include customer name, email address, phone number, payment method preferences, and other relevant transaction information.

- **Payment Methods:**
    - **Card Payments:** When a customer selects card payment, they are directed to a secure payment page to enter their card details, including card number, expiration date, name on the card, and security code.
    - **Cash Payments:** Customers selecting cash payment will receive a receipt confirming their reservation.

- **Transaction Processing:**
    - For card payments, the system validates the transaction, sends a verification code, and generates a receipt including the payment summary.
    - After successful payment, customers receive a receipt that they present at the ticket counter or designated area for online reservations.

Payment for Membership

- **Membership Registration:**
    - Membership payments are made by card only at the time of registration.
    - Customers must pay for their membership separately from movie reservations.
- **Transaction Processing:**
    - Membership payments follow a similar process as movie reservations, but are exclusively handled through card payments.

End-of-Month Reporting

- **Income Calculation**
    - At the end of each month, the payment manager calculates the total income earned from membership payments and movie ticket reservations.

This function ensures secure handling of payment information, facilitates convenient payment management for customers, and supports accurate financial reporting for the theater.

Staff Management

The **Staff Management** section is a vital component of the Theater Booking and Management System. It handles all employee-related tasks, ensuring efficient management

of personnel within the theater. The primary actor in this section is the staff supervisor, who oversees all employee management activities

Key Functions:

1. **Employee Registration:**
    - The staff supervisor is responsible for entering newly hired personnel into the system.
    - Employee registration includes capturing personal details such as name, address, age, date of birth, and contact information.
2. **Employee Details Management:**
    - The staff supervisor can edit employee details to keep records up to date, accommodating changes such as updated addresses and phone numbers.
    - The staff supervisor can delete an employee's details from the system when they resign or leave the company.
3. **Leave Evaluation:**
    - Employees must submit leave requests, which require approval from the staff supervisor before processing.
    - The staff supervisor can approve or reject leave requests based on company policies and operational needs.
4. **Salary Management:**
    - The salary management component is critical for employee compensation.
    - The staff supervisor is responsible for assigning salaries, bonuses, and overtime (OT) for each employee.
    - Finalization of salary allocations is conducted by the staff supervisor to ensure accurate and timely payments.

This section of the system ensures comprehensive management of staff, enhancing operational efficiency and supporting employee engagement within the theater.

Non-Functional Requirements

- User-Friendly and Modern UI

  The system should be intuitive and easy to use for both technically savvy users and those without technical knowledge, providing a familiar and accessible user interface.

- Availability

  The system must be available for use at all times and from any location, ensuring that users can access its functions whenever needed.

- Security and Privacy

  The system must protect user data from unauthorized access, ensuring that personal information is kept secure and not shared with third parties.

- Performance

  The system should perform its tasks quickly and efficiently, with minimal downtime to ensure a seamless user experience.

- Scalability

  The system must be capable of handling increasing amounts of data and user interactions without compromising performance or stability.

- Reliability

  The system must operate reliably and continuously without unexpected interruptions or downtime.

- Compatibility

  The system should be compatible with other software and systems that users may need to integrate or interact with.

- Accessibility

The system should be accessible and usable for all users, including those with disabilities, ensuring that everyone can benefit from its features.

- Maintainability

  The system should be easy to maintain, with the ability to update or modify the system to improve performance and add new features as needed.

- Cost

  The system should be cost-effective, offering good value for the benefits it provides to users while remaining affordable.

Technical Requirements

- Operating System:
  The system should be designed to work with a specific operating system, such as Windows, MacOS, or Linux.

- Hardware:
  Hardware elements of the system, such as processing speed, memory size, and storage capacity, should match the necessary requirements.

- User Interface:
  The system should have an easy-to-use interface that allows users to interact with the system and perform necessary tasks.

- Networking:
  The system should be able to connect to a network to enable data transfer and communication with other devices.

- Database:
  The system should have a database to store and manage data efficiently.

- Data Security:
  The system should have appropriate security measures in place to protect data from unauthorized access, such as encryption and user authentication.

- Scalability:
  As the system expands, it must be scalable and able to manage growing volumes of data and users.

Literature Review

This literature review explores existing theater booking and management systems, focusing on innovative features and integrations, particularly in 'SKYLIGHT CINEMA,' a pioneering platform that combines various functionalities within a single system.

Our research involved a thorough examination of similar systems, both locally in Sri Lanka and internationally. A key observation is that most existing systems focus primarily on movie management, with limited integration of additional functionalities.

User Account Management: A significant deviation in existing systems is their approach to user account management. Many platforms, such as PVR , Excel World, and Colombo City Center, do not allow customers to manage their profiles due to the necessity for physical attendance. 'SKYLIGHT CINEMA' differentiates itself by enabling customers to manage their profiles, providing a more personalized and user-friendly experience. Additionally, it allows staff to efficiently manage their accounts, enhancing overall operational efficiency.

Resource and Maintenance Management: Another notable gap in current systems is the lack of a dedicated resource and maintenance management feature. Systems like those at PVR , Excel World, and Colombo City Center lack comprehensive tools for managing resources and maintenance. 'SKYLIGHT CINEMA' addresses this by incorporating a robust resource and maintenance management system, ensuring optimal operational efficiency and timely facility upkeep.

Online Booking Functionality: While several systems include movie management, few offer the functionality to book tickets online. Systems like Active and Coyote Entertainment Center provide online booking for movies. 'SKYLIGHT CINEMA' stands out by offering a comprehensive movie management system that includes online booking, providing users with a seamless and convenient reservation process.

Methodology

Methods

Agile Software Engineering

Methodology The Agile methodology is a project management approach that involves breaking the project into phases and emphasizes continuous collaboration and improvement. These are various Agile methodologies, with Scrum, Kanban, and Extreme programming (XP) being some of the most popular ones Each of these approaches has its own unique set of practices and tools, but all share a commitment to flexibility, collaboration, and iterative development. In this project we use Kanban as our development methodology.

The Agile Manifesto is a set of guiding values and principles that underpin the Agile methodology for software development. The Agile Manifesto emphasizes flexibility, collaboration, and customer satisfaction. The four key values are,

1. Individuals and Interactions over Processes and Tools:
   - Emphasizes the importance of people and their interactions in the development process.
   - Recognizes that effective communication and collaboration among team members are essential.

2. Working Software over Comprehensive Documentation:
   - Prioritizes the delivery of working and valuable software over extensive documentation.
   - Encourages a focus on tangible results and functional products.

3. Customer Collaboration over Contract Negotiation:
   - Advocates for close collaboration with customers and stakeholders throughout the development process.
   - Prioritizes customer feedback and involvement to ensure the delivered product meets their needs.

4. Responding to Change over Following a Plan:
   - Acknowledges that requirements and priorities may change during the development process.
   - Encourages teams to be adaptive and responsive to changes in customer needs or project requirements.

Reasons for selecting Agile Methodology

1. Flexibility and Adaptability:

    - Agile methodologies enable teams to quickly adjust to changes in requirements and market conditions, ensuring responsiveness to evolving customer needs.

2. Customer Satisfaction:

    - By focusing on customer collaboration throughout development, Agile ensures that the final product closely aligns with customer expectations, leading to higher satisfaction.

3. Collaboration:

    - Agile promotes teamwork, communication, and collaboration, fostering a sense of shared ownership and accountability, which can enhance problem-solving and solution quality

4. Transparency:

    - Agile encourages open communication and transparency, building trust among team members and stakeholders and aligning everyone towards common goals.

5. Continuous Improvement:

    - Agile supports ongoing learning and refinement of processes, ensuring that the team continuously enhances its practices and outcomes.

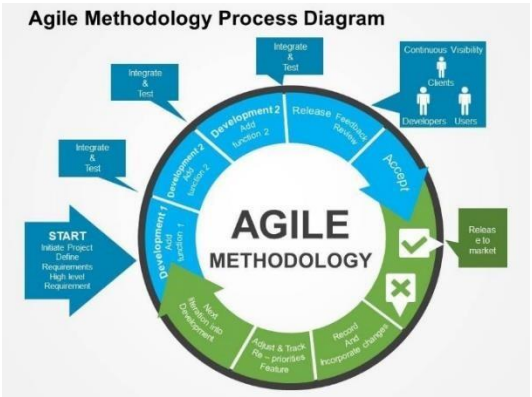


Figure 2- Agile Methodology

Tools and Technologies

We use MERN stack for developing our web application. MERN is a combination of 4 technologies. MERN Stack is a full stack web technology. MERN Architecture allows you to easily construct a three-tier architecture namely front end, back end, and database entirely using JavaScript and JSON.

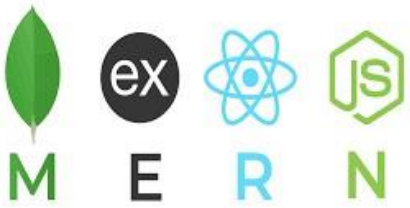


Figure 3- Mern Stack

- **M**ongoDB (Database approach) – MongoDB is a document oriented, no sequel (SQL) database.

Figure 4- Mongo DB

- **E**xpress JS – Express is a Node.js framework designed for building APIs, web applications and cross-platform mobile apps. Express is high performance, fast, un opinionated and lightweight. It is used as a server-side scripting language.

Figure 5- Express Js

- **R**eact JS (Frontend implementation) – React is a JavaScript library for building fast and interactive user interfaces for the web as well as mobile applications. React divides the UI into multiple components, which makes the code easier to debug, and each component has its own property and function.

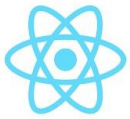


Figure 6-React Js

- **N**ode JS (Backend implementation) – Node.js is an open-source, crossplatform JavaScript runtime environment and library for running web applications outside the client's browser.

Figure 7- Node Js

Apart from MERN Stack we use the following tools for our web application implementations. •

Visual Studio code (IDE)

Visual Studio code is the platform we use to develop the coding part. Visual studio code a streamlined code editor with support for development operations like debugging, task running, and version control. [10]

- **GitHub (Version Control)**

GitHub is a web-based interface that uses Git, the open-source version control software that lets multiple people make separate changes to web pages at the same time. [11]

- **Postman (API Testing)**

Postman is an API platform for building and using APIs. Postman simplifies each step of the API lifecycle and streamlines collaboration.[12]

Project Plan

	July				August				September				October			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
PROJECT INITIATION AND REQUIREMENTS GATHERING PHASE																
Requirements Gathering																
Analyze the functionalities																
Project Charter Submission																
Preparing proposal document and presentation																
Proposal Evaluation																
DESIGN AND DEVELOPMENT PHASE																
Design the UI																
Design the database																
Frontend coding																
Backend coding																
Integrate with database																
Testing																
Deploy the system																
Evaluation																
Final report writing And presentation																

Work breakdown structure

	Student ID and Name with initials	Tasks
1	IT22209320 MIURANGA W.A.R	• Implementing ticketing booking section (Provide functions for the user to make a booking and add to the cart along with the number of tickets and seat position, view the cart, update a booking in cart (Ticket Count) and remove any booking made and then user can proceed with the payment. • Completed the background section in the proposal report.
2	IT22134080 Dias N.T.B.P	• Implementing customer engagement management section. Provide functions to users to submit feedback, inquiries, reviews, and ratings for movies. This function enables any user to view the submitted reviews and ratings. Also, this function facilitates users to modify or delete their submitted review and rating. The customer service manager also views submitted reviews and ratings, feedback and manage inquiries and review and ratings.
3	IT22157928 Vidushan A.A.D.D.N	• Implementing the user management section including membership options during registration, with an added OTP for security. Once registered, users can log in, view, and edit their profiles, and delete their accounts if needed. The system also allows users to check booked movies and activities in their profiles. • Completed the literature review section in the proposal report.

4	IT22282668 Pathirana I.M	• Implementing the staff management section. (Provide functions for the staff supervisor to add employees, update employees' details, delete employees from the system, manage employees' leaves and salaries.) • Completed non-functional requirements and technical requirements section of the proposal.

5	IT22252340 Walallawita K.L.T.D	• Implementing the movie management section. (Provide functions for the movie manager to add movies, update movie details, delete movies from the movie list when it is no longer being screened. Also, this function facilitates the movie manager to efficiently schedule, modify and synchronize movie show times. Also, this facilitates users to view the movies that are added to the system and select a show time from the available list.) • Completed Tools and Technologies in Methodology section of proposal report.
6	IT22113122 Bandara T.C.N	• Implementing maintenance management section (Provide functions to manage all resources related to the complete system and all the facilities provided by the system to its users including creating, updating, editing, and deleting them. • Completed Aims and Objective section of proposal report.

7	IT22267986 Gunasekara L.M.N.P	• Implementing payment management section (provide function for user to add, update or delete their personal details and they can select the payment methods as their preferences. When they make a movie reservation. And when they make membership payments they can pay by card. So that at the end of the month payment manager can calculate the total income of the system. • Completed the Gantt chart and its description for the proposal report.
8	IT22207968 Manathunga M.A.D.V.G	• Implementing report and analytics management (provide function user to add update or delete their all reports in company, these are the staff reports, inventory reports, and monthly or annual income reports

Evaluation Method

Evaluation will confirm whether the developed product achieved the functional and nonfunctional requirements of stakeholders. The system will be evaluated by comparing the new system functions with problems identified in the analysis phase.

Functionality and Features:

Movie Management: Evaluate the system's ability to efficiently manage and display information about the latest movies, show timings, and detailed descriptions.

Ticket Booking: Evaluate the ticket booking process, including the ease of selection, secure payment options, and confirmation mechanisms.

Membership Tiers: Check the different membership tiers, benefits associated, and privileges offered to enhance user experience.

User Experience (UX) and Interface (UI):

Ease of membership Registration: Evaluate the membership registration process and how seamless it is for users to create accounts.

Navigation: Assess the overall navigation of the platform, ensuring that users can easily find information and perform actions.

Security and Privacy:

Secure Payment Options: Ensure that the payment management system is secure.

User Data Protection: Verify the measures in place to protect user data, especially considering the collection of personal information during membership registration.

Integration:

System Integration: Check if the system integrates seamlessly with other tools and databases, such as payment gateways, activity venues, and movie databases.

Customer engagement Management:

Feedback Mechanism: Implement a feedback system to gather user reviews and suggestions for continuous improvement.

Customer Support: Evaluate the customer support channels and response times for addressing user concerns or issues.

Management and Administration:

Staff Management: Assess the tools provided for managing staff roles, responsibilities, and access levels within the platform.

Resource Management: Evaluate the efficiency of resource allocation and management, especially for venues and activity resources.

Performance Metrics:

Load Time: Evaluate the platform's load time, especially during peak usage hours.

Transaction Success Rate: Monitor the success rate of ticket bookings

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Appendix

The Theater Booking and Management System offers a wide range of functionalities to streamline operations. The Ticket Booking feature provides an easy-to-use interface for exploring events, selecting show times and seats, and calculating costs automatically. User Management distinguishes between Unregistered and Registered users, enabling account creation and comprehensive access for registered users. Movie Management allows the addition, updating, and scheduling of movies. Customer Engagement Management strengthens relationships through profile management and feedback collection. Maintenance Management oversees inventory and facility upkeep. Reports and Analytics Management offers insights via customizable reports and visualizations. Payment Management handles secure transactions for tickets and memberships. Staff Management tracks employee details, leave requests, and salaries. Finally, Interaction Management lets users submit and manage feedback, inquiries, reviews, and ratings.