Project Report:
Automated Meeting Room Booking System

Hady Khan, Vrushali Nafade, Yashmitha Poojary, Pragati Bisen, Ritika Malviya, Janavi Sridhar, Harsh Srivastava and Nikhil Gupta

Team Room-antics

Abstract. The Automated Meeting Room Booking System simplifies and enhances the process of reserving meeting spaces in a corporate setting. It empowers users to efficiently manage meeting rooms, offers seamless booking, and enforces essential business rules. This system is designed to boost workplace productivity, ensuring a hassle-free experience for all users.

Keywords: Meeting room booking, Automation, Workplace productivity, Efficiency, Corporate collaboration, Resource management

Table 1. Table of Contents

1 Project Overview

1.1 Project Scope

The Automated Meeting Room Booking System automates the process of reserving meeting rooms within a company. It allows employees to search for and book meeting rooms based on their requirements.

1.2 Description

The system is designed for three types of users: Admins, Managers, and Members. Key functionalities include creating and configuring meeting rooms, booking rooms for meetings, and managing user data.

2 Database Design

2.1 Meeting Room Table

– Unique Name
– Seating Capacity
– Ratings
– Amenities Available
- Projector
- Wi-Fi Connection
- Conference Call Facility
- Whiteboard
- Water Dispenser
- TV
- Coffee Machine
– Per Hour Cost (in credits)

2.2 Users Table

– Unique ID
– Name
– Email
– Phone
– Credits
– Role (Admin/Manager/Member)

2.3 Booking Information Table (Schedules)

– Unique ID
– Meeting Room
– Date
– Start Time
– End Time
– Booked By (User ID)

2.4 Meeting Table

– Unique ID
– Title
– Organized By (User ID)
– Meeting Date
– Start Time
– End Time
– Type of Meeting
- Classroom Training
- Online Training
- Conference Call
– Business
– List of Members Attending the Meeting

2.5 Additional Information

– The per hour cost for meeting rooms is calculated based on amenities.
– Manager users have 2000 credits and are charged based on per hour cost.
– Manager credits reset to 2000 every Monday morning.
– Mandatory amenities are defined based on meeting type.

3 User Interface (UI) Design

3.1 Home Page

– Displays application information.
– Lists meeting rooms with Name, Seating Capacity, Total Meetings Conducted, Ratings.
– Links to Import Users and Login.

3.2 Import Users

– Allows importing user data from an XML file.
– Validates and inserts user data into the database.

3.3 Login Page

– Captures User ID and Email for login.
– Redirects users to Admin, Manager, or Member pages based on their roles.

4 Functional Requirements

– Security measures to ensure unauthorized access is restricted.
– Logging of unhandled exceptions for debugging and auditing.
– Implementation of transactions for data consistency.

5 Technology Stack

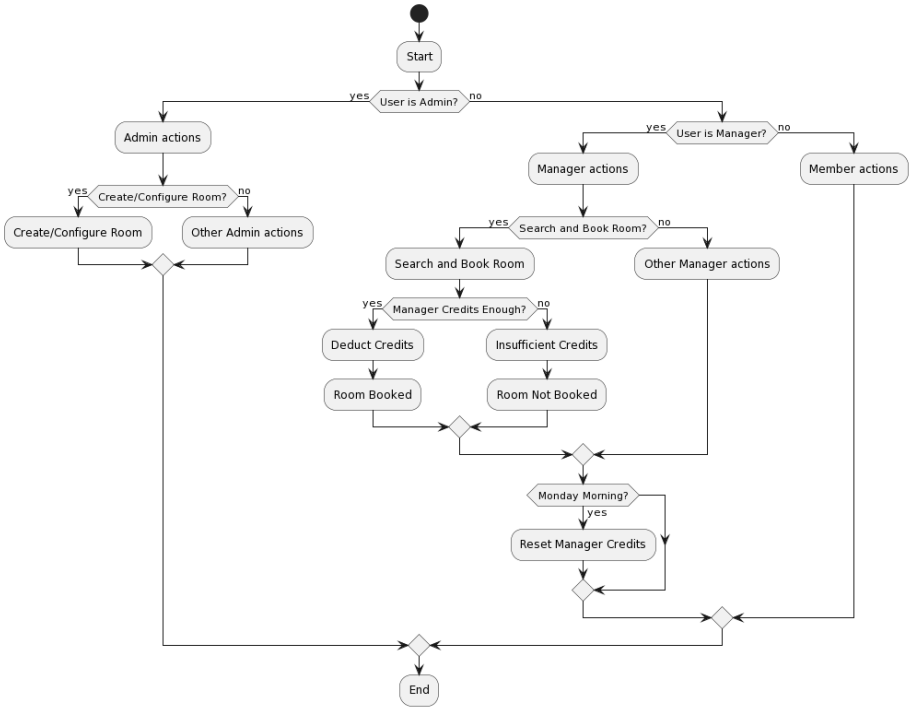
– Backend: Java
– Frontend: HTML/CSS, JavaScript, Bootstrap
– Database: MySQL

6 Architecture

Table 2. Architecture

Data access layer (DAO)	Responsible for database interactions. Contains methods for querying and updating the database. Uses JDBC to connect to the database.
Business logic layer (Service)	Contains the core business logic of the application. Implements functions like searching for available meeting rooms and booking meeting Interacts with the DAO for data access.
User interface layer (controller)	Handles user interactions. Calls business logic layer functions based on user input. Provides the interface for users to search and book meeting rooms.

7 Flowchart



Flowchart Description: Meeting Room Booking System

Start: The flowchart starts at the "Start" node.

Admin Check: It checks if the user is an Admin. If yes, it proceeds with Admin-specific actions.
Admin Actions: Admin actions include creating and configuring meeting rooms. If the Admin chooses to create or configure a room, the flow proceeds to "Create/Configure Room." Otherwise, it goes to "Other Admin Actions."

Manager Check: If the user is not an Admin, the flowchart checks if the user is a Manager. If yes, it proceeds with Manager-specific actions.

Manager Actions: Manager actions include searching and booking a meeting room. If the Manager chooses to "Search and Book Room," it checks if the Manager's credits are enough to book the room.
Credits Check: If the Manager has enough credits, it deducts the credits and proceeds to "Room Booked." Insufficient Credits: If the Manager does not have sufficient credits, it goes to "Insufficient Credits," indicating that the room can-

not be booked.

Other Manager Actions: If the Manager chooses other actions, they are performed here.

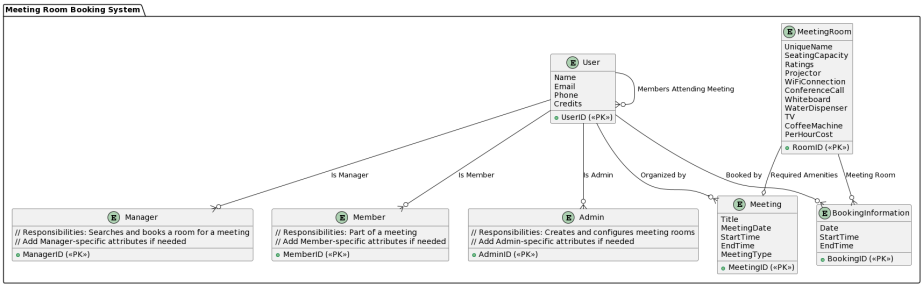
Monday Morning Check: After Manager-specific actions, the flowchart checks if it's Monday morning. If yes, it proceeds to "Reset Manager Credits" to reset Manager credits to 2000.

Member Actions: If the user is not an Admin or Manager, the flowchart assumes the user is a Member and performs Member-specific actions.

End: The flowchart ends at the "End" node.

This flowchart represents the process flow of a meeting room booking system, including actions for Admins, Managers, and Members, as well as the daily renewal of Manager credits on Monday mornings.

8 ER Diagram



Entity-Relationship Diagram Description
Entities:

User: Represents the users of the meeting room booking system. It includes attributes like UserID (Primary Key), Name, Email, Phone, Credits, and Role. Users can have one of three roles: Admin, Manager, or Member.

Admin: Represents users with administrative privileges. Admins have the responsibility of creating and configuring meeting rooms. The Admin entity includes AdminID (Primary Key) and Admin-specific attributes.

Manager: Represents users who can search for and book meeting rooms. Managers are responsible for booking rooms for meetings. The Manager entity

includes ManagerID (Primary Key) and Manager-specific attributes.

Member: Represents users who are part of meetings but do not have administrative or managerial roles. The Member entity includes MemberID (Primary Key) and Member-specific attributes.

MeetingRoom: Represents the meeting rooms available for booking. It includes attributes like RoomID (Primary Key), UniqueName, SeatingCapacity, Ratings, and various amenities such as Projector, WiFiConnection, ConferenceCall, Whiteboard, WaterDispenser, TV, CoffeeMachine, and PerHourCost.

BookingInformation: Represents information about the bookings of meeting rooms. It includes BookingID (Primary Key), Date, StartTime, and EndTime. It also links to the User entity (Booked by), MeetingRoom entity (Meeting Room), and Meeting entity (Required Amenities).

Meeting: Represents the meetings organized within the system. It includes MeetingID (Primary Key), Title, MeetingDate, StartTime, EndTime, and MeetingType. Meetings are associated with Users (Organized by) and MeetingRooms (Required Amenities).

Relationships:
User to Admin, Manager, Member: These relationships represent the role of users in the system. A user can be associated with one of the roles: Admin, Manager, or Member.

User to BookingInformation: Represents the relationship between users and their bookings. A user can be linked to multiple booking records, indicating the meetings they have booked.

User to Meeting: Represents the relationship between users and meetings they have organized. A user can be associated with multiple meetings they have organized.

User to User (Members Attending Meeting): Represents the relationship between users and the meetings they attend. Users can be part of multiple meetings.

Room to BookingInformation: Shows that meeting rooms can be booked for various meetings.

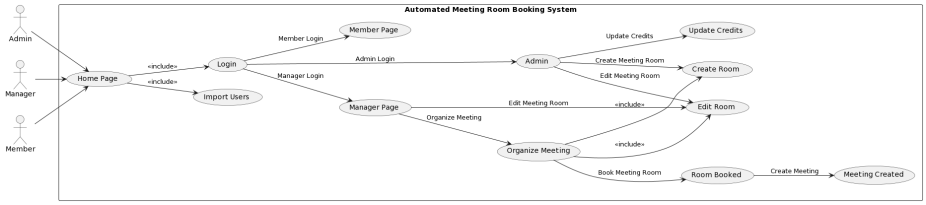
Room to Meeting (Required Amenities): Indicates the required amenities for meetings held in specific rooms.

Attributes: Various attributes for each entity are listed, such as UserID, Name, Email, Phone, Credits, etc. These attributes capture relevant informa-

tion about the entities.

This ERD provides an overview of the entities, relationships, and attributes in your Meeting Room Booking System, helping to visualize how users, meeting rooms, bookings, and meetings are connected within the system. It forms the foundation for database design and system development.

9 UML Diagram



T his is a UML use case diagram that represents an "Automated Meeting Room Booking System." Use case diagrams are a way to visualize the functionality of a system from the perspective of its users or actors. In this diagram, various actors and use cases are defined to show how different users interact with the system and what actions they can perform. Let's break down the diagram:

Actors:

Admin: An administrator of the meeting room booking system.

Manager: A manager who can organize meetings and manage meeting rooms.

Member: A regular member who can book meeting rooms and attend meetings.

Use Cases:

Home Page: Represents the main landing page of the system.

Login: Users (Admin, Manager, Member, and External User) can log in to access the system.
Admin Login: Admin can log in.
Manager Login: Manager can log in.
Member Login: Regular members can log in.

Admin: This is a use case for admin-related actions.

Create Meeting Room: Admin can create new meeting rooms.
Edit Meeting Room: Admin can edit meeting room details.
Update Credits: Admin can update user credits.

Manager Page: Represents the manager's dashboard.

Organize Meeting: Manager can organize meetings.
Edit Meeting Room: Manager can also edit meeting room details.

Member Page: Represents the member's dashboard.

Book Meeting Room: Users can book meeting rooms.

Create Meeting: This use case is associated with booking a meeting room and creating a meeting in it.

Connections/Interactions:

The actors (Admin, Manager, Member, External User) interact with the Home Page.

The Home Page includes two use cases: Import Users and Login, which are part of the home page functionality.

Depending on the type of user (Admin, Manager, Member), they can log in to the system.

Admins can perform actions such as creating meeting rooms, editing meeting rooms, and updating credits.

Managers can organize meetings, edit meeting rooms, and book meeting rooms.

Booking a meeting room leads to the creation of a meeting.

External Users can also access the system via the home page.

Arrows and labels indicate the relationships between actors and use cases, such as associations, includes, and extends. For example, the Admin actor includes Create Meeting Room and Edit Meeting Room, which means these actions are included within the Admin use case.

This diagram provides a high-level overview of the interactions and functionalities of the Automated Meeting Room Booking System from the perspective

of different users and stakeholders.

10 Test Cases

– Test cases are provided for key functionalities, including organizing a meeting and creating a meeting room. These test cases ensure the system's reliability and functionality.

11 Conclusion

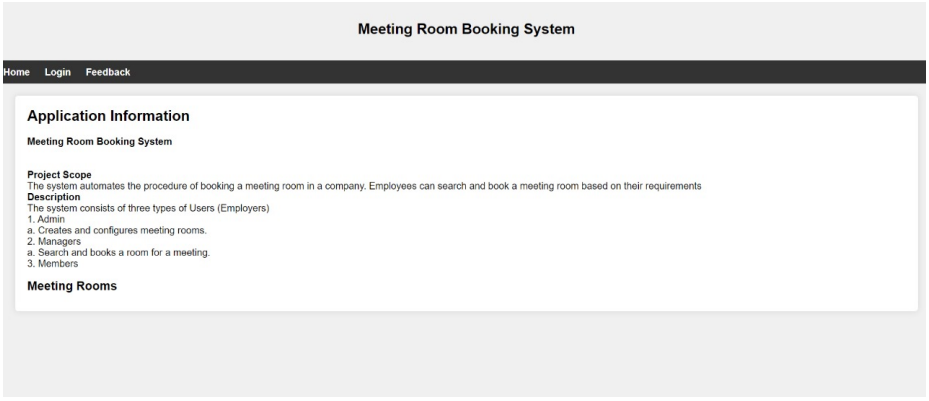
The Automated Meeting Room Booking System provides a robust and efficient solution for booking meeting rooms within a company. It offers a user-friendly interface, strong security measures, and efficient data management. The system adheres to the specified business rules and requirements, making it a valuable asset for any organization.

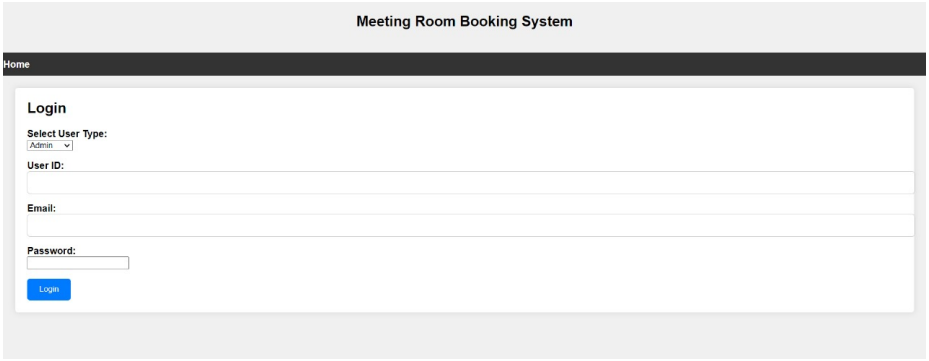
12 Future Scope

Implement a real-time availability checker to show immediate room availability based on user-selected criteria. Integrate with popular room scheduling and calendar systems like Microsoft Outlook or Google Calendar. Send automated reminders and notifications to meeting attendees. Allow attendees to provide feedback on meetings, presenters, and meeting rooms. Explore chatbots or visual assistants to handle user queries and room bookings.

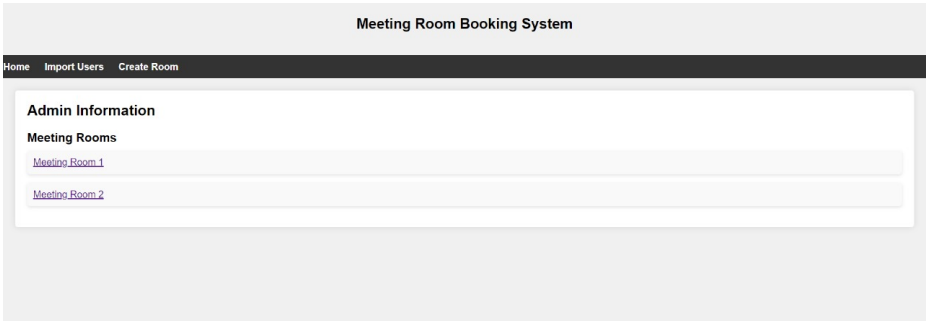
13 Appendices

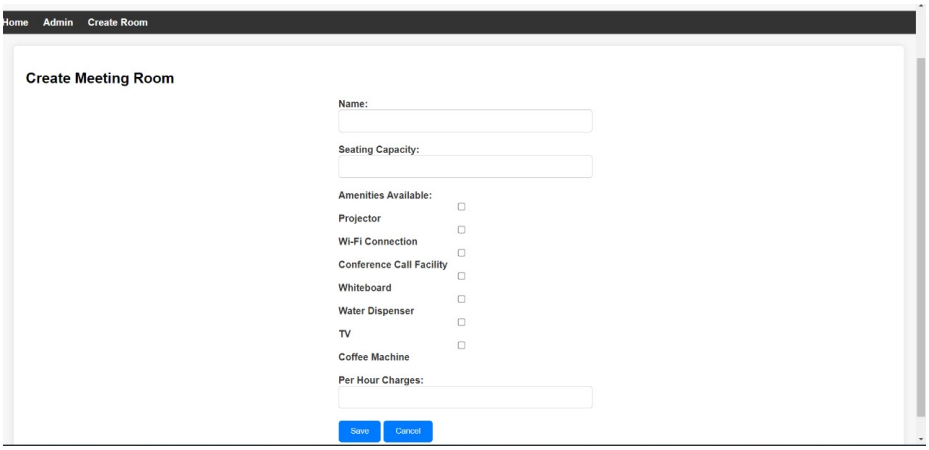
This section shows the snapshots of the project in proper flow aligned with the flowchart

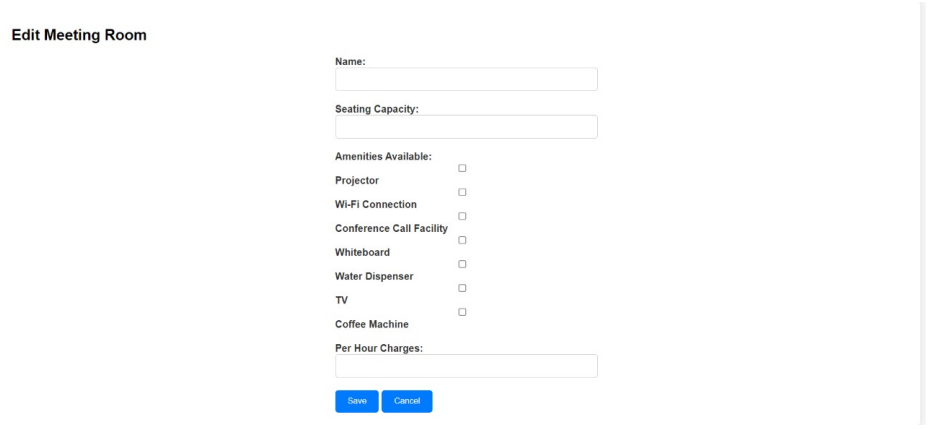


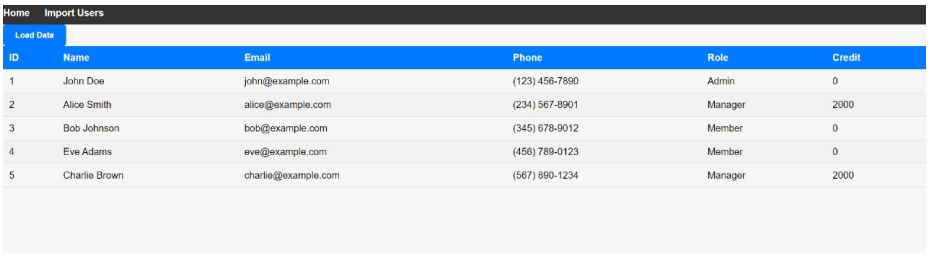

Meeting Room Booking System
Home
Login
Select User Type:
Admin
User ID:
Email:
Password:
Login

ADMIN LOGIN

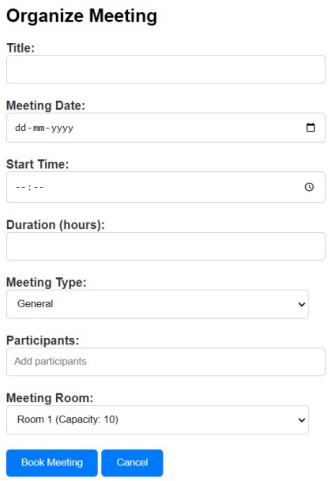

Meeting Room Booking System
Home
Import Users
Create Room
Admin Information
Meeting Rooms
Meeting Room 1
Meeting Room 2

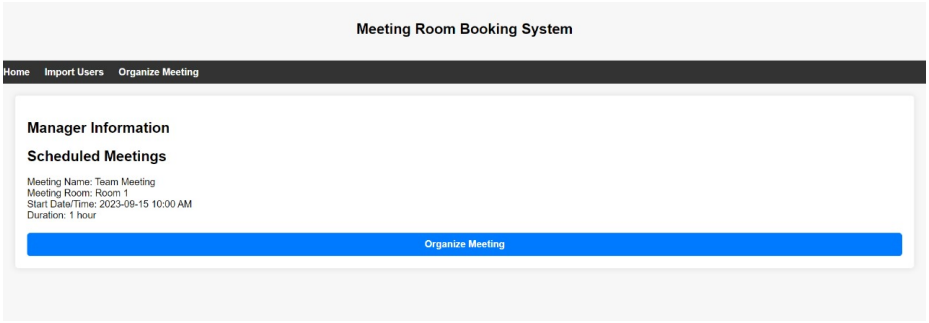

Home
Admin
Create Room
Create Meeting Room
Name:
Seating Capacity:
Amenities Available:
Projector
Wi-Fi Connection
Conference Call Facility
Whiteboard
Water Dispenser
TV
Coffee Machine
Per Hour Charges:
Save
Cancel





MANAGER LOGIN





MEMBER LOGIN