DBMS Project Architecture

Project Moment
By: Team CSE Moment

Classroom allocation management portal for Mahindra University

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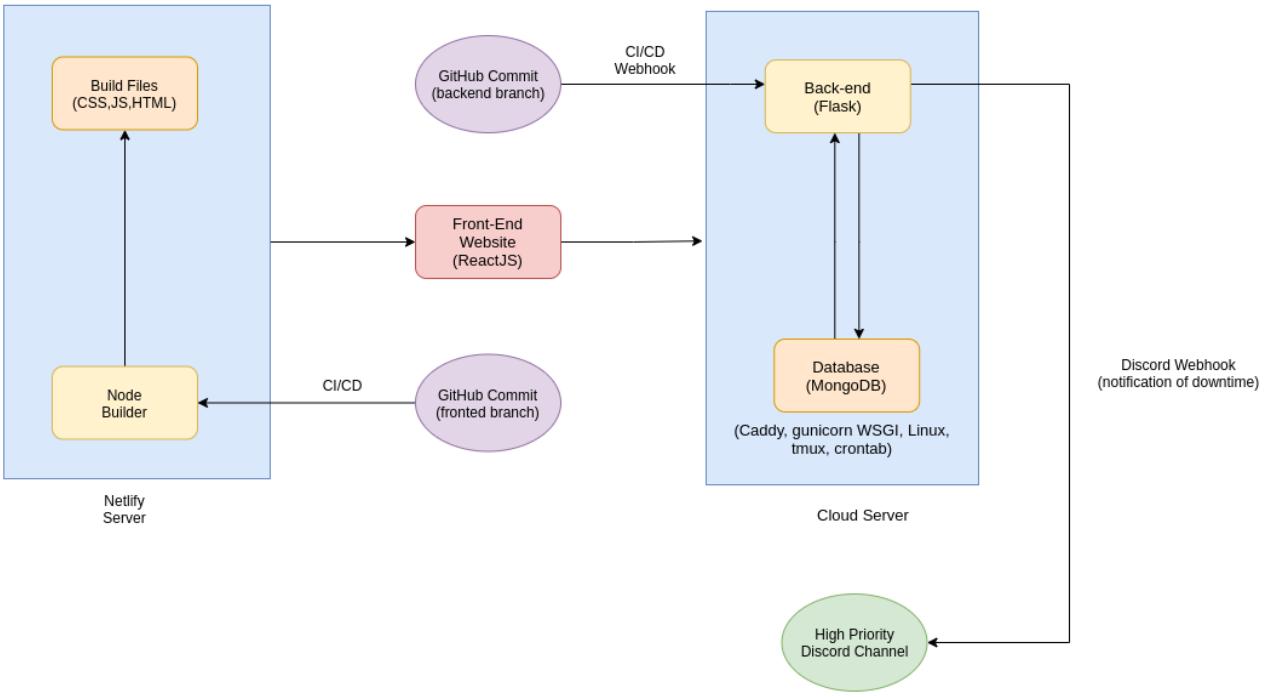
Overview

At Mahindra University, classrooms are allocated manually - either at the beginning of the semester for day-to-day classes, or when students request Mr. Sudhakar for access. This process involves a lot of human intervention, making it quite tedious and inefficient.

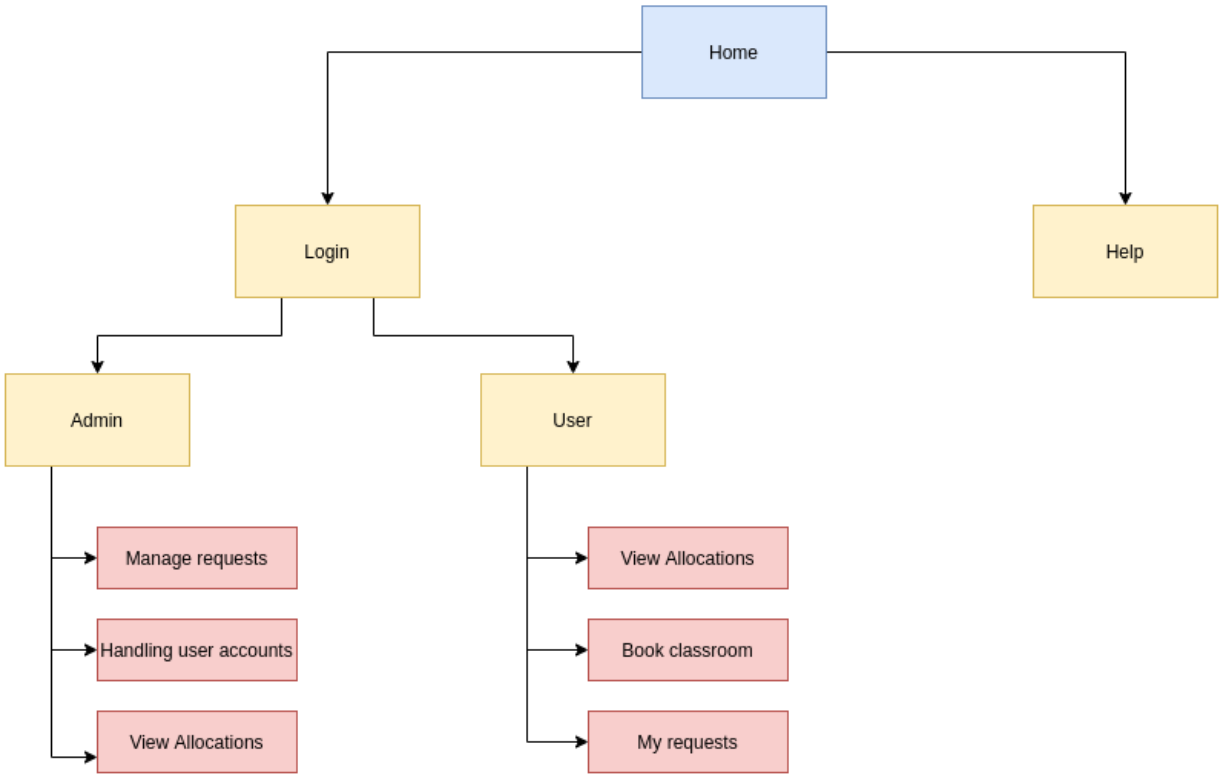
We want to attempt to design an optimal solution to this problem of classroom allocation at MU. Our goal is to help the students, professors, clubs and the management to conveniently manage the booking of rooms for various events and activities.

We want to create a portal where users can easily filter through available classrooms on the required date and time based on the capacity and location of the rooms, and place a request. The user would be able to check the allocation status and cancel the request as well. The admin would be responsible for approving the requests placed on the portal.

Application architecture



Application Flow



Frontend

Features

- Framework - ReactJS
- Hosting platform - Netlify
- CI/CD configuration

Pages

Home page

- User login
- Admin login

User pages

1. Login
2. User home page
3. View Allocations (Top level view of MU classrooms layout)
4. Room Booking
    - Filter available classrooms based on date, time, location and capacity
    - View available classrooms
    - Request access to a particular classroom and provide details regarding intended use
5. My requests
    - View all room requests placed
    - Check allotment status
    - Cancel a booking

Admin pages

1. Login
2. User account handling
    - Add account
    - Edit account
    - Delete account
3. View Allocation
4. View Requests
    - Approve a request
    - Reject a request
    - Notify the user
    - Notify the campus security

Backend

Features

- Framework: Flask
- DB Connection: MongoDB-python driver
- Linux server
- Caddy reverse proxy
- Crontab for uptime

API Endpoints:

1. Login related
    a. /user/login (GET): For authenticating user login. Returns a JWT token.
    b. /user/logout (GET): Logs out a user
    c. /user/register (GET): For registering a new user
    d. /user/delete (DELETE): Deletes an existing user
2. Allocation
    a. /alloc/req (GET): To request an allocation
    b. /alloc/del (DELETE): To cancel an allotment
    c. /alloc/del_req (DELETE): To cancel a request
    d. /alloc/check_all (GET): TO get all room allocations

DBHandler:

MongoDB python connector, pymongo

Database

DBMS - MongoDB

Tables

1. Users Table
    - ID
    - Password
    - Role (student/faculty/admin)

2. Classroom table
    - Classroom ID
    - Location (floor)
    - Capacity (no. of people it can host)
    - Availability (is the room usable)

3. Request Table
    - Request ID
    - User ID (user who requested the room)
    - Classroom ID (room requested)
    - Start Time
    - End Time
    - Purpose

4. Schedule table
    - Classroom ID
    - Request ID
    - Authorized by (ID of the authorizer)