HBH - Himadri Boys Hostel All-in-One Platform

License: ISC
Technology Stack: Node.js, React, MongoDB

HBH is a comprehensive digital platform designed specifically for the Himadri Boys Hostel at NIT Hamirpur. It aims to streamline hostel management, student services, and administrative operations, providing a centralized hub for both students and administrators. The platform facilitates seamless communication, complaint management, academic tracking, and other essential hostel-related services, ensuring a well-organized and efficient hostel experience.

About the Platform

The HBH Platform is a full-stack web application that serves as a unified interface for hostel residents and administrators. By consolidating essential services into one system, it enables students to access relevant information such as daily mess menus, notices, and complaint status updates while allowing administrators to manage student records, handle complaints, and maintain hostel operations effectively. Its responsive design ensures accessibility on both desktop and mobile devices, offering a smooth user experience across platforms.

Features

For students, HBH provides secure authentication through college email-based registration and login, guaranteeing that only verified users can access the system. Students can submit and track complaints regarding maintenance or facilities, view daily mess schedules, and stay informed via the notice board. The platform also allows students to manage their profiles, updating personal information and changing passwords securely.

Administrators benefit from a robust dashboard offering analytics and insights into hostel statistics, complaint resolution workflows, student record management, and notice and mess menu control. Additional capabilities include CGPI tracking for academic performance monitoring and role-based access control for committee members and admins.

Technical features include automated email integration for OTP verification and notifications, JWT-based authentication ensuring secure access, and real-time updates for notices and complaints. Role-based access provides different permission levels for students, committee members, and administrators, while the mobile-friendly interface built with Tailwind CSS ensures a consistent and intuitive user experience.

Technical Stack and Tools

The backend is built on Node.js with Express.js as the web framework, MongoDB for data storage, and Mongoose as the object data modeling tool. Security is reinforced through JWT authentication,

password hashing with bcryptjs, and automated email services using Nodemailer or Resend. Cross-origin requests are handled via CORS configuration.

On the frontend, the application uses React 19 with Vite as the build tool, Tailwind CSS for styling, Axios for HTTP requests, and React Router DOM for client-side routing. State management is handled using Zustand, and notifications are implemented with React Toaster. Development tools include Nodemon for automatic server restarts and Cross-env for environment variable management.

Getting Started

To set up the application, the user should ensure Node.js (v18 or higher) and MongoDB are installed. After cloning the repository, dependencies are installed both for the root directory and frontend. Environment variables must be configured in a .env file, including database connection strings, JWT secret keys, and email service credentials for Gmail or Resend. Once configured, the backend can be started in development mode, followed by the frontend server, making the platform accessible locally. For production deployment, the build process generates optimized assets served through the backend server.

Project Structure

The HBH project is organized into backend and frontend directories. The backend contains server configuration, controllers for authentication, admin operations, complaints, CGPI management, mess menu, and notice management, along with Mongoose schemas and API routes. Middleware for authentication and utility functions are included, as well as email configuration and data seeding scripts. The frontend houses the React application, with reusable components, page components, global styles, state management, and utility functions, along with public assets.

API Endpoints

HBH exposes RESTful API endpoints for authentication, complaint management, administration, CGPI tracking, mess menu, and notices. Authentication endpoints support user registration, login, email verification, password reset, and logout. Complaint endpoints enable creation, tracking, and status updates, while admin endpoints provide authentication verification and access to dashboard analytics.

Usage

Students register using their NIT Hamirpur email and verify via OTP before accessing the platform. They can submit complaints, view mess menus, and read notices. Administrators log in with dedicated credentials to manage complaints, update notices and mess schedules, and access student records. The platform enforces security through mandatory email verification, password hashing, JWT tokens, role-based access, and server-side input validation.

Contributing and Development Guidelines

Contributors are encouraged to fork the repository, create feature branches, commit meaningful changes, and submit pull requests. The project maintains coding standards with proper error handling, validation, and testing. Documentation should be updated whenever significant changes are introduced.

Known Issues and Future Enhancements

Current limitations include potential delays in email delivery during high traffic, large file uploads requiring additional configuration, and fine-tuning mobile responsiveness. Future plans include mobile application development, real-time chat functionality, room allocation system, fee payment integration, event management, visitor management, and laundry tracking.

License and Support

This project is licensed under the ISC License. For support, queries can be directed via email to sanketsinghsameer@proton.me or through GitHub Issues. The platform is developed with dedication to Himadri Boys Hostel at NIT Hamirpur, with acknowledgment to all contributors and the open-source community for tools and libraries used.