**SYNOPSIS**

**Report on**

**ROOM WALA**

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**ABSTRACT**

This project introduces a comprehensive web application developed using the MERN (MongoDB, Express.js, React, Node.js) stack, aimed at simplifying the search for rooms and PG accommodations near KIET Group of Institutions. The platform is designed with both students and professionals in mind, offering a streamlined, user-friendly experience for finding housing options in the vicinity. Through its intuitive interface, users can easily browse, search, and filter accommodation listings based on key criteria such as location, price, amenities, and availability.

The front-end, built with React, provides a responsive and dynamic user experience, ensuring seamless navigation across devices. On the back-end, Node.js and Express.js efficiently manage the application’s core functionalities, including handling user requests, managing listings, and enabling real-time updates to ensure the most accurate information is displayed. MongoDB serves as the database, allowing for efficient storage and retrieval of large volumes of data, including room details, PG descriptions, landlord information, and user preferences.

The application’s robust search and filter capabilities help users narrow down their options quickly, while features like user reviews and ratings add an extra layer of reliability to the accommodation selection process. The platform not only offers a central hub for accommodation listings but also provides added convenience through features such as map integration, allowing users to view the proximity of listings to the campus, and contact forms to connect directly with property owners.

By leveraging the MERN stack, this web application ensures high performance, scalability, and a smooth user experience. Ultimately, it aims to reduce the hassle of finding nearby accommodations, making it easier for students and professionals associated with KIET to secure reliable and comfortable housing.

****Keywords****:

MERN stack, Accommodation search, User-friendly interface

**TABLE OF CONTENTS**

Page Number

1. Introduction --
2. Literature Review --
3. Project / Research Objective --
4. Project Flow/ Research Methodology
5. Project / Research Outcome --
6. Proposed Time Duration --

7. References/ Bibliography

**INTRODUCTION**

Finding suitable accommodation near educational institutions can be a challenging and time-consuming task for students and professionals alike. To address this issue, this project introduces a full-stack web application built using the MERN (MongoDB, Express.js, React, Node.js) stack, specifically designed to streamline the search for rooms and PG accommodations near KIET Group of Institutions. By offering a centralized platform with real-time listings, this application simplifies the process of locating housing by providing users with the ability to search, browse, and filter accommodations based on various criteria such as location, price, and amenities.

The front-end, developed with React, delivers a responsive and dynamic interface, ensuring a seamless experience for users across multiple devices. Node.js and Express.js power the back-end, enabling efficient handling of user requests, data management, and real-time updates. MongoDB, the database technology, is used for storing and retrieving accommodation details, allowing for the scalable management of large volumes of data.

This platform also incorporates advanced features such as user reviews, ratings, and map integration, enhancing the reliability and ease of the search process. Through this user-friendly and performance-oriented solution, the application aims to transform the accommodation search experience for the KIET community, making it more efficient, transparent, and accessible.

**LITERATURE REVIEW**

Finding suitable accommodation near educational institutions is often a complex and time-consuming challenge for students and professionals. Many struggle to find reliable, convenient, and affordable housing options in proximity to their campuses. To address this growing need, this project presents a comprehensive full-stack web application built using the MERN (MongoDB, Express.js, React, Node.js) stack. The platform is designed specifically to streamline the search process for rooms and PG accommodations near KIET Group of Institutions. By providing a centralized hub with real-time accommodation listings, the platform simplifies the search process, allowing users to browse, search, and filter housing options based on key criteria such as location, price, amenities, and availability.

The application’s front-end, developed using React, offers a dynamic, responsive, and user-friendly interface that ensures a seamless experience across all devices, from desktops to mobile phones. The back-end, powered by Node.js and Express.js, efficiently manages core operations, including processing user requests, managing listings, and ensuring that all information is up-to-date in real-time. MongoDB serves as the database solution, enabling the efficient storage and retrieval of vast amounts of data related to room listings, property details, landlord information, and user preferences. This robust infrastructure ensures high performance, scalability, and reliability, which are critical for managing a growing number of users and listings.

In addition to the basic search and filter functionalities, the platform incorporates advanced features such as user reviews, ratings, and map integration, making it easier for users to assess the quality and proximity of accommodations to the KIET campus. The map feature allows users to visualize the distance of listed properties from key locations, while the review system adds transparency and trustworthiness to the decision-making process by showcasing feedback from previous tenants. Contact forms within the platform further enhance convenience by enabling users to directly communicate with property owners or landlords.

By leveraging the power of the MERN stack, this web application not only optimizes the accommodation search process but also ensures a smooth, efficient, and transparent experience for the users. Ultimately, this platform aims to transform how students and professionals affiliated with KIET Group of Institutions find reliable, convenient, and comfortable accommodations by offering a modern, scalable, and user-centric solution.

**Project/ Research Objective**

The primary objective of this project is to develop a robust and user-friendly web application using the MERN stack (MongoDB, Express.js, React, Node.js) to simplify the process of finding rooms and PG accommodations near KIET Group of Institutions. Specifically, the project aims to:

1. **Provide a Centralized Platform:** Create a centralized hub for students and professionals to easily browse, search, and filter available accommodation options based on key parameters such as location, price, and amenities.
2. **Enhance User Experience:** Leverage React to build a responsive and intuitive interface that ensures seamless navigation across multiple devices, enhancing user satisfaction and engagement.
3. **Enable Real-Time Updates:** Implement real-time data management using Node.js and Express.js to ensure that accommodation listings, availability, and pricing are constantly up-to-date, improving the reliability of information presented to users.
4. **Efficient Data Handling:** Use MongoDB to manage and store large volumes of accommodation details, including room descriptions, landlord information, user preferences, and feedback, ensuring efficient retrieval and scalability.
5. **Incorporate Advanced Features:** Integrate additional features such as user reviews, ratings, and map functionalities to help users make informed decisions by assessing the quality of accommodations and their proximity to the KIET campus.
6. **Facilitate Communication:** Provide built-in communication tools, such as contact forms, to enable seamless interaction between potential tenants and property owners or landlords, streamlining the rental process.
7. **Ensure Scalability and Performance:** Build a scalable, high-performance system capable of handling a growing user base and expanding accommodation listings over time, ensuring the platform remains reliable and responsive under increasing demand.

Overall, the project aims to revolutionize the accommodation search experience for the KIET community by creating a transparent, efficient, and user-centric platform.

**Project Flow/ Research Medology**

The development of the web application for finding rooms and PG accommodations near KIET Group of Institutions will follow a structured methodology, ensuring a systematic approach to achieving the project objectives. The process is divided into several key stages:

**1. Requirement Analysis**

* **Stakeholder Identification:** Identify the primary users (students, professionals, landlords) and understand their needs.
* **Feature Identification:** Gather functional requirements such as search, filter, reviews, real-time listings, map integration, and contact forms.
* **Non-functional Requirements:** Define performance, scalability, security, and usability requirements.
* **Technology Stack:** Finalize the use of MERN stack (MongoDB, Express.js, React, Node.js) as the core technology for the application.

**2. System Design**

* **Frontend Design:**
  + Create wireframes and user interface (UI) mockups using Figma or similar tools to visualize the user journey.
  + Design a responsive layout for mobile and desktop users, focusing on a simple and engaging experience.
* **Backend Architecture:**
  + Design the backend system using Node.js and Express.js, outlining the APIs that will handle user requests, data retrieval, and real-time updates.
* **Database Design:**
  + Develop the schema for MongoDB, defining collections for users, accommodations, reviews, landlords, and inquiries.
* **System Flow Diagrams:** Create data flow diagrams (DFD) and entity-relationship diagrams (ERD) to outline system interactions and database structure.

**3. Development**

* **Frontend Development (React):**
  + Build the user interface using React, focusing on key functionalities like search, filter, and map integration.
  + Implement responsive design for seamless access across devices.
  + Integrate Material-UI or Bootstrap for a modern look and feel.
* **Backend Development (Node.js, Express.js):**
  + Set up server-side logic to handle user requests, accommodation listings, and search/filter functionalities.
  + Ensure real-time updates for accommodation availability using efficient API calls.
* **Database Setup (MongoDB):**
  + Create and configure the MongoDB database for storing accommodation data, user information, reviews, and communication logs.
  + Use MongoDB’s flexible schema to allow scalable and efficient data management.

**4. Feature Integration**

* **Search and Filter Functionality:** Implement search features allowing users to filter accommodations based on location, price, amenities, and availability.
* **Map Integration:** Use Google Maps API or similar services to allow users to view the proximity of listings to KIET Group of Institutions and other landmarks.
* **User Reviews and Ratings:** Build a review system where users can rate and review properties, improving the trust and reliability of listings.
* **Real-Time Notifications:** Incorporate real-time updates for new listings, changes in availability, and notifications using WebSockets or other real-time communication protocols.

**5. Testing and Quality Assurance**

* **Unit Testing:** Conduct individual tests on both frontend components and backend API endpoints to ensure each function works as expected.
* **Integration Testing:** Test the integration of all components, ensuring seamless interaction between the frontend, backend, and database.
* **User Acceptance Testing (UAT):** Perform testing with a group of real users (students, professionals) to gather feedback on usability, performance, and design.
* **Bug Fixes:** Identify and fix any bugs found during testing to improve the stability and performance of the application.

**6. Deployment**

* **Frontend Deployment:** Deploy the frontend using a platform such as Vercel or Netlify for easy accessibility and scalability.
* **Backend Deployment:** Host the backend on platforms like Heroku or Render to ensure reliable server performance.
* **Database Hosting:** Use cloud-hosted MongoDB services (such as MongoDB Atlas) for high availability, performance, and scalability.

**7. Post-Deployment Maintenance**

* **Monitoring and Analytics:** Set up monitoring tools like Google Analytics or New Relic to track user behaviour, performance metrics, and potential bottlenecks.
* **User Support and Feedback:** Incorporate user feedback and provide continuous support through email, chat, or forms.
* **Feature Enhancements:** Based on user feedback, iterate and improve existing features, adding new functionalities as required (e.g., payment integration, roommate search).

**8. Documentation**

* **Technical Documentation:** Provide detailed documentation of the system architecture, API endpoints, and database schema to assist future developers.
* **User Guide:** Create a simple user manual outlining how to navigate and use the platform for students, professionals, and landlords.

**9. Future Scope**

* Explore integration of additional features such as automated rent payment systems, roommate matching, and virtual property tours.
* Scale the platform for use at other institutions with similar accommodation needs.

**Project Flow Summary:**

1. Requirement Analysis
2. System Design (Frontend, Backend, Database)
3. Development (Frontend & Backend)
4. Feature Integration (Search, Map, Reviews)
5. Testing (Unit, Integration, UAT)
6. Deployment (Frontend, Backend, Database)
7. Maintenance (Monitoring, Feedback, Enhancements)
8. Documentation (Technical and User)
9. Future Enhancements

This structured approach ensures the successful development and deployment of the web application, addressing the specific needs of students and professionals looking for accommodation near KIET Group of Institutions.

**Project/ Research Outcomes**

The development of the web application using the MERN stack for finding rooms and PG accommodations near KIET Group of Institutions will result in several key outcomes:

1. Centralized Accommodation Platform: The project successfully delivers a user-friendly, centralized web platform where students and professionals can search for rooms and PGs near KIET Group of Institutions. The platform consolidates various housing options, eliminating the need for users to browse through multiple platforms.
2. Enhanced User Experience: By leveraging React and implementing a responsive design, the platform ensures seamless navigation and ease of use across different devices, offering an improved user experience. Users can quickly search, filter, and view accommodation listings based on location, price, and amenities, with minimal friction.
3. Real-Time Listings and Updates: The integration of real-time data management through Node.js and MongoDB ensures that accommodation listings, availability, and other key information are always current. Users can trust that they are accessing the most up-to-date information when making decisions about housing.
4. Advanced Search and Filter Capabilities: Users can refine their accommodation searches using advanced filtering options such as location proximity, price range, and availability of amenities. This significantly improves the efficiency of the search process, saving users time and effort.
5. Integrated Map and Location Features: The use of map integration allows users to visualize the exact location of properties in relation to KIET Group of Institutions and nearby landmarks. This feature enhances decision-making by providing geographic context, helping users choose accommodations based on proximity to the campus.
6. User Reviews and Ratings System: The platform allows users to leave reviews and rate properties based on their experience, creating a transparent environment that helps future users make informed decisions. This builds trust and reliability within the community, ensuring better accommodation choices.
7. Efficient Communication with Property Owners: The project facilitates direct communication between potential tenants and property owners through integrated contact forms. This makes it easier for users to inquire about availability, schedule visits, or request additional details, streamlining the accommodation booking process.
8. Scalable and High-Performance Application: The platform’s architecture ensures that it is highly scalable and capable of supporting an increasing number of users and accommodation listings. This allows for future growth and expansion to other locations or institutions without compromising performance.
9. Improved Accommodation Search for KIET Community: The platform reduces the complexity and challenges faced by students and professionals when searching for accommodation near KIET Group of Institutions. It offers a convenient and reliable solution that significantly improves the overall housing search experience.
10. Long-Term Applicability and Future Enhancements: The project provides a foundation for future enhancements, such as adding payment gateways for rent processing, roommate matching systems, and virtual tours of properties. Additionally, it has the potential to be expanded for use at other educational institutions.

**Proposed Time Duration**

**Proposed Time Duration for "Project hub"**

1. **Planning and Research (2 weeks)**
2. Conduct surveys, interviews, and focus groups with stakeholders.
3. Analyze existing tools and define user personas and use cases.
4. Document and finalize requirements specification.
5. **Design Phase (3 weeks)**
6. Develop wireframe and prototypes; gather feedback.
7. Plan application architecture and design system integration.
8. Define project milestones, timelines, and prepare project plan.

**3.Development Phase (6 weeks)**

1)Implement core functionalities such as task management, communication tools, and progress tracking.

2) Integrate third-party tools and API, perform iterative testing and debugging.

**4.Testing and Quality Assurance (2 weeks)**

1) Conduct unit and integration testing.

2)Perform user acceptance testing (UAT) with beta testers.

3) Address feedback, fix bugs, and finalize testing

**5.Deployment and Launch (1 week)**

1)Deploy the application to production servers.

2)Provide user training, support, and monitor initial performance.

**6.Post-Launch Support and Maintenance (2 weeks)**

1)Collect user feedback and performance metrics.

2) Implement updates and enhancements, provide regular maintenance and support.

**Total Proposed Time Duration: 16 weeks**

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