SYNOPSIS

Report on

PROJECT JUGAAD

by

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Session:2024-2025 (III Semester)

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(2023 - 2025)

ABSTRACT

Project Jugaad is a web application aimed at fostering responsible consumption and production within the KIET academic community, in line with the principles of **Sustainable Development Goal 12 (SDG 12)**. This platform enables students and faculty members to rent, share, and borrow essential items and other products, creating a sustainable ecosystem where resources are efficiently utilized. By restricting access to only KIET members, **Project Jugaad** ensures a secure and trustworthy environment, encouraging users to collaborate and reduce unnecessary purchases, thus contributing to a more resource-efficient campus.

The application leverages the **MERN stack (MongoDB, ExpressJS, React, Node.js)** to deliver a seamless user experience. It incorporates strong authentication and security mechanisms through **bcrypt** for password encryption and **JWT (JSON Web Tokens)** for session management. Users can interact via a built-in chat feature, powered by **Socket.io**, allowing for real-time communication and collaboration. Additionally, **MongoDB** ensures secure data storage with efficient filtering and indexing, making the platform highly responsive.

Project Jugaad also provides real-time notifications, keeping users updated on item availability and transaction status, while personalized user profiles help track activity on the platform. By promoting sharing over ownership, this project significantly reduces waste, supports sustainable consumption, and fosters a community-driven approach to resource management within KIET.

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INTRODUCTION

In an era where sustainability is a pressing global concern, fostering responsible consumption and production has become a priority. **Project Jugaad** aligns with the goals of **Sustainable Development Goal 12 (Responsible Consumption and Production)** by providing an innovative solution that promotes the efficient use of resources within the academic community. This web-based application is exclusively designed for students and faculty at KIET to rent, share, and borrow essential daily-use items and other products within a secure, closed network. The platform enables users to reduce unnecessary purchases and extend the lifecycle of items, contributing to a more sustainable and resource-efficient campus environment.

The core objective of **Project Jugaad** is to create a community-driven platform where individuals can lend or borrow resources such as books, gadgets, or other daily essentials without any external involvement. The platform ensures high trust and security among users by restricting access to only KIET members, further encouraging responsible and mindful consumption practices. By effectively redistributing resources, **Project Jugaad** minimises waste generation, thus supporting the overarching vision of a circular economy.

Technologically, **Project Jugaad** is built on the **MERN stack (MongoDB, ExpressJS, React, Node.js)**, providing both a robust backend and an intuitive user interface. The application ensures the secure handling of user data through authentication and authorization mechanisms using **bcrypt** for hashing passwords and **JWT (JSON Web Tokens)** for secure user sessions. Additionally, all data is stored securely using **MongoDB**, with efficient data filtering and indexing capabilities to ensure a smooth and responsive user experience. The built-in chat feature, developed using **Socket.io**, enables real-time communication between users, allowing them to negotiate, exchange information, or finalize deals effortlessly.

Real-time notifications enhance the overall user experience by keeping users updated on item availability or transaction status, ensuring they are always informed about the platform's latest activities. Each user also has a personalized profile, which is essential for tracking their interactions and items listed on the platform.

By promoting sharing over ownership and encouraging collaboration within the KIET community, **Project Jugaad** plays a significant role in addressing the need for responsible consumption and production on campus. It not only benefits students and faculty by offering an alternative to purchasing new items but also fosters a culture of sustainability that can be emulated by other institutions.

INTRODUCTION

1.1 Overview

Resource sharing plays a crucial role in fostering collaboration and efficiency in the dynamic world of academic communities. Students and faculty often require a platform to share daily-use essentials, exchange items, and communicate seamlessly within a secure network. Traditional methods, such as verbal coordination or fragmented systems, are often inefficient and lack scalability.

Project Jugaad addresses these challenges by providing an innovative platform that simplifies real-time resource sharing and communication. Built using the MERN stack, it integrates modern web technologies to create a streamlined and user-friendly experience.

The Project Jugaad has the following key features:

- Interactive platform to showcase the various requests posted by the user.
- A fast way to manage the reports is by the admin.
- The easy way to handle the payments.
- React to handle a single-page application.
- MongoDB to handle the databases.
- Only the people who have the KIET email ID can only login and register.

User Experience (UX) Approach

Project Jugaad places significant emphasis on providing a **smooth and intuitive user experience (UX)**. The UX design is centered around usability, simplicity, and customization:

User-Centric Design:

- The platform is built with a focus on the needs and behaviors of its users, ensuring an intuitive and enjoyable experience. User feedback is continuously gathered to refine and improve functionality.

Simple and Intuitive Interface:

- A clean and minimalistic interface ensures that users can easily navigate the platform, browse items, and manage their listings without technical expertise.

Responsive Design:

- The platform is optimized for all devices, including desktops, tablets, and smartphones, ensuring seamless access regardless of the user's preferred device.

Personalized User Profiles:

- Each user has a customizable profile to manage their listed items, rentals, and interactions, creating a sense of ownership and personalization.

Secure and Trustworthy Environment:

- Strong authentication and secure data handling build trust, providing users with a safe and reliable platform for transactions.

Community Engagement Tools:

- Features like reviews, ratings, and in-app messaging foster interaction and trust among users, enhancing the sense of community.

Key Technologies Used

Project Jugaad leverages modern technologies to provide a scalable, efficient, and robust platform:

- **React** for frontend development, ensuring a modular and responsive user interface.
- **Node.js** and **Express.js** for backend development, allowing real-time data processing and handling of multiple concurrent users.
- **MongoDB** for storing project data, ensuring flexibility and scalability in handling large datasets.
- **TailwindCSS** for designing the webpages and improving their styles

Technology Stack

Technology Stack (MERN):

- The platform's core structure is built on the **MERN stack** (MongoDB, ExpressJS, React, NodeJS), which is a proven, scalable, and efficient technology stack for web applications.
    - **MongoDB** provides flexible, scalable, and document-oriented data storage, making it suitable for managing user profiles, product listings, and transactions.
    - **ExpressJS** ensures smooth handling of HTTP requests and routes the API calls efficiently.
    - **ReactJS** enables a responsive and dynamic user interface, which is essential for a seamless user experience.
    - **NodeJS** allows for high-speed, non-blocking I/O operations, making it ideal for managing multiple concurrent requests.

Authentication and Security:

- **JWT (JSON Web Tokens)** for secure user authentication ensures that each user's session is authenticated and that unauthorized access is blocked.
- **bcrypt** provides strong encryption for passwords, ensuring that user data is protected.
- **OAuth 2.0** or **Multi-Factor Authentication (MFA)** can be integrated for enhanced security, especially for sensitive transactions or high-value items.**Data Scalability**:
- **MongoDB** is horizontally scalable, meaning as the platform grows, it can handle more data and users without compromising performance.

UI/UX Design:

- **ReactJS** ensures a modular, reusable UI design, making it easy to maintain and update.
- CSS frameworks like **TailwindCSS** or **Material UI** can be used for a consistent, responsive design across multiple devices (desktop, tablet, and mobile).

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