NEXT GEN EMPLOYABILITY PROGRAM

CREATING A FUTURE-READY WORKFORCE

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CAPSTONE PROJECT SHOWCASE

Personal Finance Manager with MERN Technology

Abstract | Problem Statement | Project Overview | Proposed Solution | Technology Used | Modelling & Results | Conclusion | Q&A

Abstract

1 **Objective**: Develop a comprehensive expense management platform where users can create, view, edit, and delete expenses with real-time updates.

2 **Technology Stack**: Built using the MERN stack (MongoDB, Express.js, React.js, Node.js) to ensure seamless functionality and scalability.

3 **User Authentication:** Implements secure user authentication to ensure data privacy and personalized access.

4 **Data Management:** Efficiently stores and manages financial transactions using MongoDB, allowing structured and scalable document handling.

Abstract

5 **Interactive UI:** A React.js-powered front-end for an intuitive and responsive user experience.

6 **API & Server-Side Logic:** Node.js and Express.js handle API requests, ensuring smooth data flow and backend operations.

7 **Collaboration Features:** Supports real-time updates, enabling multiple users to track and manage expenses efficiently.

8 **Practical Learning:** Provides hands-on experience in full-stack development, integrating key features like authentication, database operations, and real-time data handling.

Problem Statement

- Personal Finance Manager with MERN Technology' => "The Expense management project is designed to create a platform where users can create, view, edit, and delete expense with real-time updates. The platform ensures that any changes made to any expense are instantly reflected across all reports. This project will provide you with hands-on experience in implementing user authentication, managing documents, and ensuring real-time collaboration using the MERN stack (MongoDB, Express.js, React.js, Node.js).

Project Overview

The Personal Finance Manager is a full-stack expense management application built using the MERN (MongoDB, Express.js, React.js, Node.js) technology stack. This project enables users to seamlessly track, manage, and analyze their financial transactions with real-time updates, ensuring an intuitive and efficient budgeting experience.

Project Overview

Tech Stack:

- MongoDB – NoSQL database for storing user expenses and financial data.
- Express.js – Backend framework for handling API requests efficiently.
- React.js – Frontend framework for building an interactive and dynamic UI.
- Node.js – Server-side runtime for executing JavaScript and handling business logic.

Proposed Solution

✅ Solution Overview

- Create, View, Edit, and Delete Expenses in an intuitive UI.
- Real-time Updates across reports and dashboards using WebSockets.
- User Authentication & Authorization for secure access.
- Data Storage in MongoDB, optimized for financial transactions.
- Responsive & Interactive UI built with React.js.

1️⃣ Frontend (React.js)

- React for state management.
- Bootstrap for a clean and responsive design.
- React Router for smooth navigation between expense tracking, reports, and settings.

Proposed Solution

2️⃣ Backend (Node.js + Express.js)

- RESTful APIs for CRUD operations (Create, Read, Update, Delete) on expenses.

3️⃣ Database (MongoDB)

- User Collection: Stores user credentials and profiles.
- Expense Collection: Stores transactions with timestamps and categories.

Technology used

◆ 1. Frontend (React.js)

- React.js – Component-based UI framework
- Redux – State management for expenses
- React Router – Navigation between pages
- Bootstrap – UI styling and responsive design
- Axios – To interact with backend APIs
- Socket.io-client – Real-time expense updates

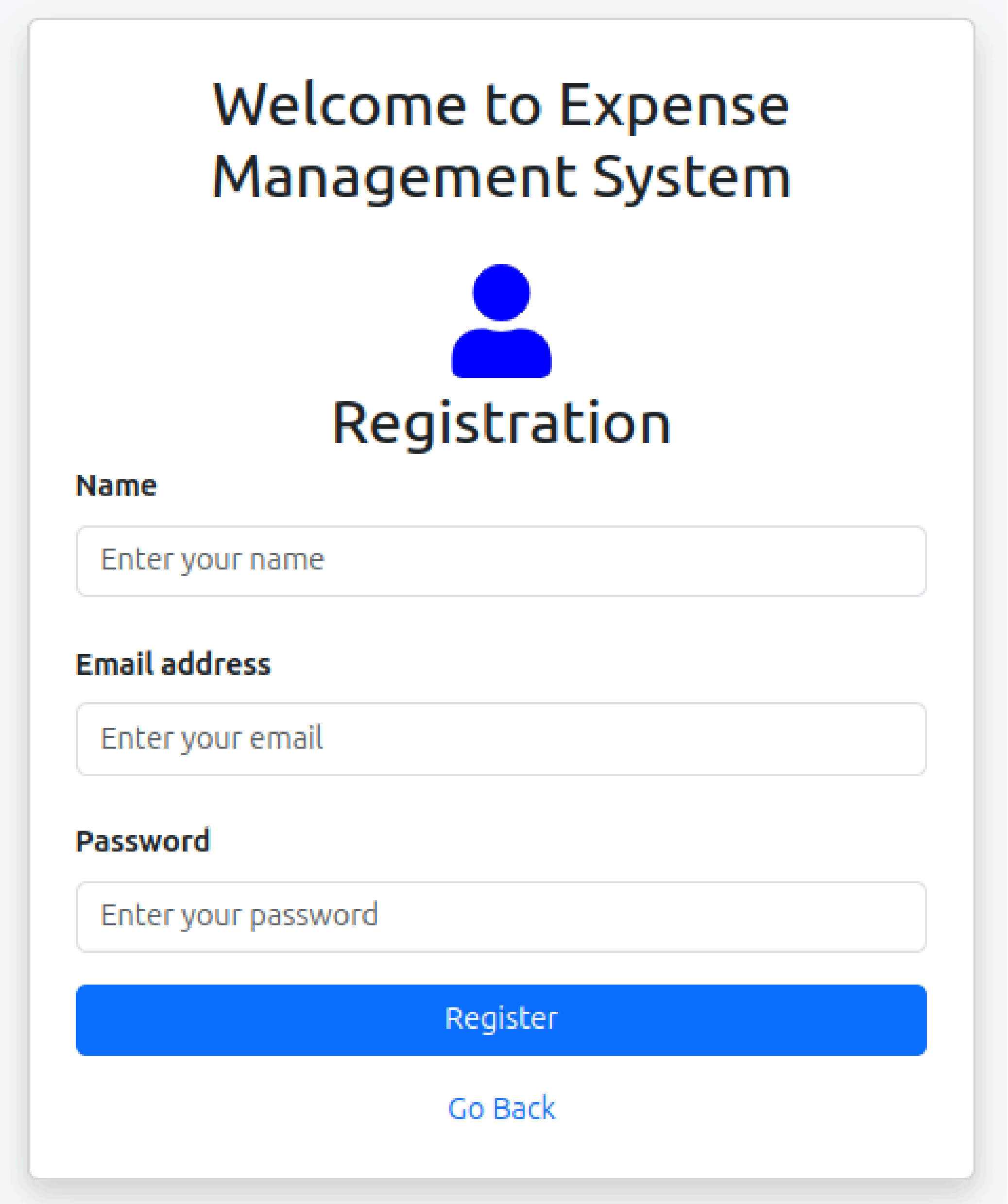
◆ 2. Database (MongoDB)

- MongoDB – NoSQL database to store expenses, users, and reports
- Mongoose – Schema-based data modeling

Technology used

- **3. Backend (Node.js + Express.js)**
  - Node.js – Server-side JavaScript runtime
  - Express.js – Lightweight web framework
  - Mongoose – MongoDB ODM (Object Data Modeling)
  - bcrypt.js – Password hashing for secure authentication
  - Socket.io – Real-time expense updates
  - dotenv – Environment variable management

Modelling & Result



Welcome to Expense Management System

Registration

Name

Enter your name

Email address

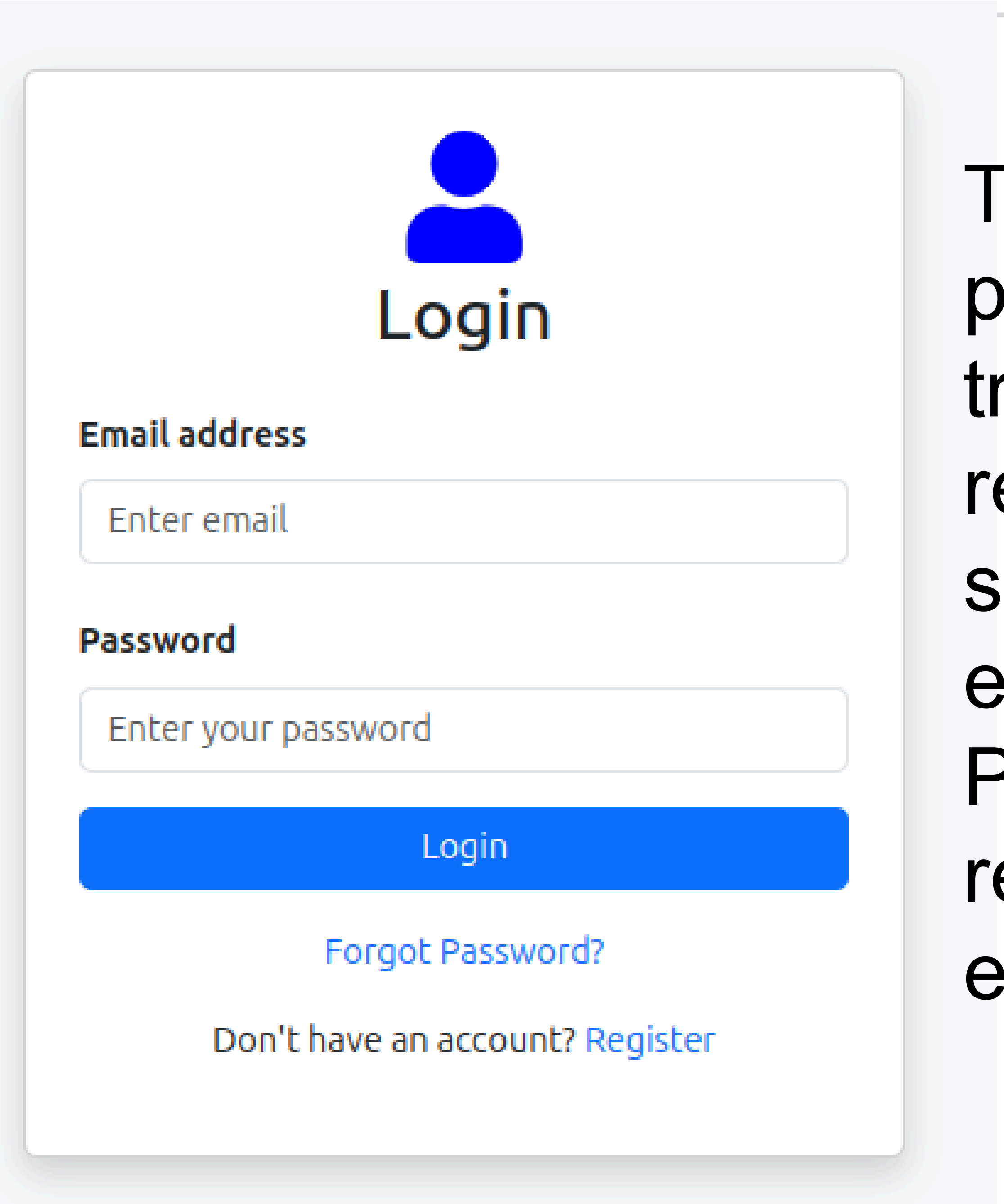
Enter your email

Password

Enter your password

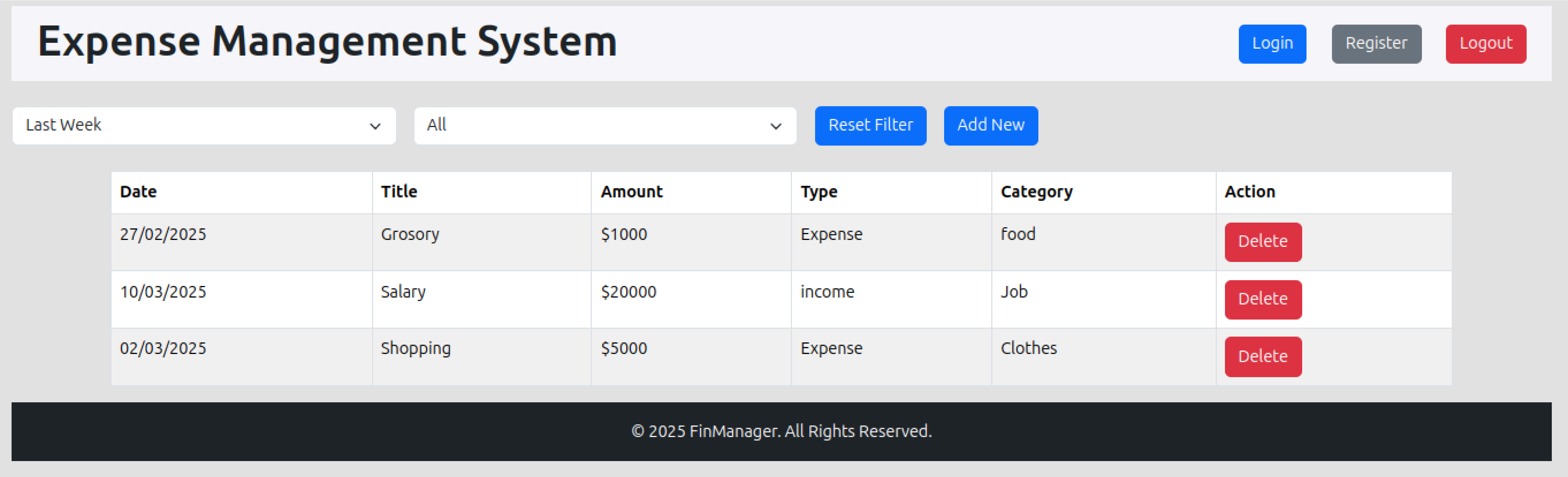
The Registration Page allows users to create an account for managing their expenses. It includes fields for Name, Email, and Password with a clean, user-friendly interface. The page ensures form validation and secure data handling before submitting the information. The "Register" button enables users to sign up, while a "Go Back" link provides navigation to the previous page. The visually appealing design enhances the user experience with clear input fields and an intuitive layout.

Modelling & Result



The Login Page of the Personal Finance Manager provides users with secure access to their expense tracking dashboard. Users can log in using their registered email and password, with ensuring data security. The page includes form validation, password encryption (bcrypt.js), and an option for "Forgot Password" recovery. Upon successful login, users are redirected to the dashboard, where they can manage expenses in real time.

Modelling & Result



Date	Title	Amount	Type	Category	Action
27/02/2025	Grosory	$1000	Expense	food	Delete
10/03/2025	Salary	$20000	income	Job	Delete
02/03/2025	Shopping	$5000	Expense	Clothes	Delete

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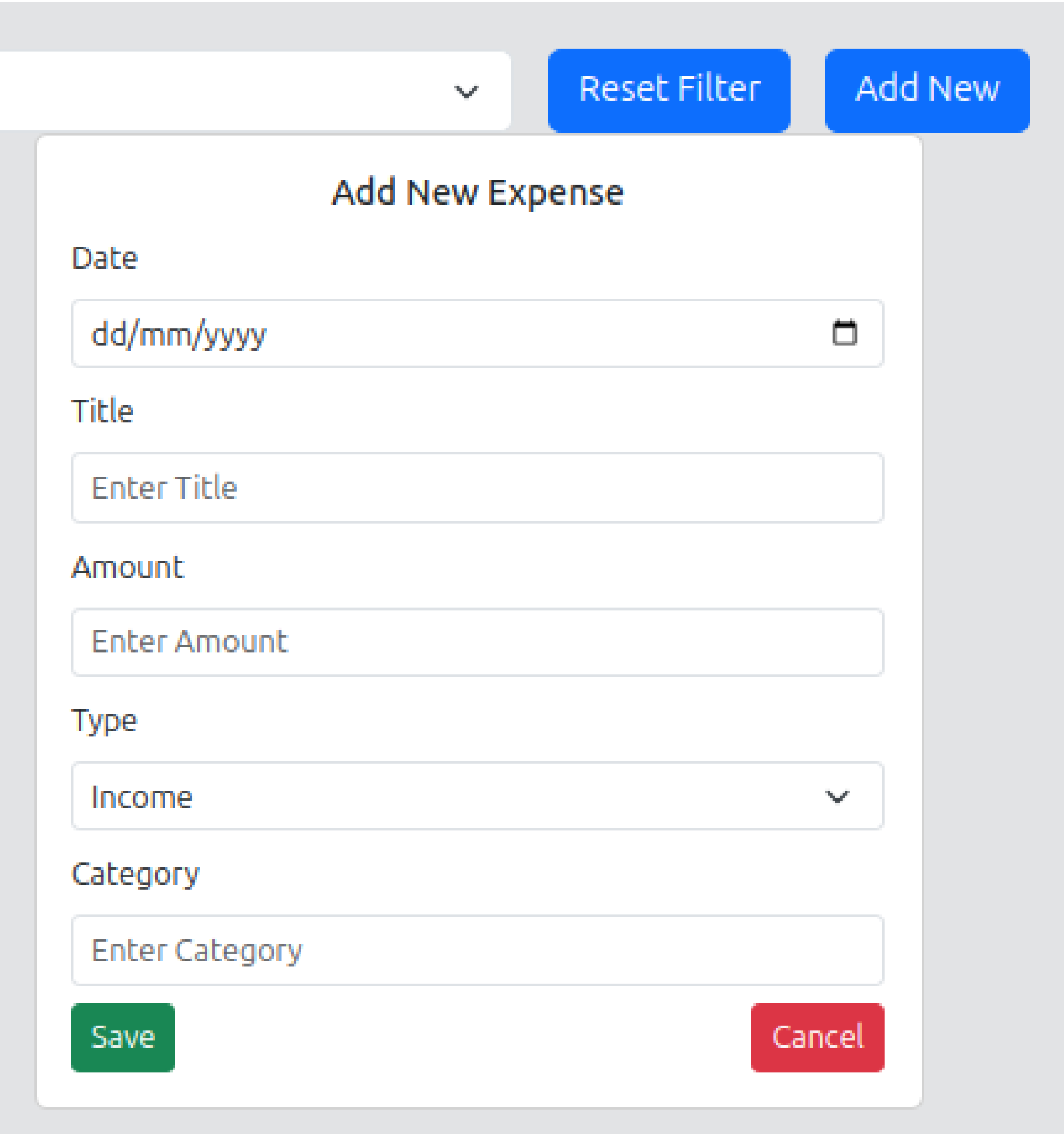
The Dashboard provides a user-friendly interface to manage financial transactions. It displays a table with Date, Title, Amount, Type (Income/Expense), Category, and Action buttons for deleting records. Users can filter expenses by time period and category, reset filters, and add new expenses via the "Add New" button. The top-right corner features Login, Register, and Logout options for authentication. At the bottom, a footer displays copyright information.

Modelling & Result



Add New Expense

Date
dd/mm/yyyy

Title
Enter Title

Amount
Enter Amount

Type
Income

Category
Enter Category

The "Add New Expense" form allows users to input and save financial transactions. It includes fields for Date, Title, Amount, Type (Income/Expense), and Category. The Save button records the expense, while the Cancel button discards the entry. The form ensures smooth data entry with an intuitive layout and a calendar picker for date selection.

Conclusion

The Expense Management System, built with the MERN stack, provides an efficient and user-friendly solution for tracking financial transactions. It offers essential features such as user authentication, role-based access control (RBAC), and real-time updates using WebSockets. Users can add, view, edit, and delete expenses through a simple and intuitive interface, with options for filtering and managing records. Secure JWT-based authentication ensures data protection, while the structured RESTful APIs allow smooth backend operations.

This system helps users efficiently manage their expenses and maintain better financial control.

Thank you!

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