‘Zero Hunger Mission App’

Research Project
Sponsored by
Silver Oak University

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1. Abstract

This report presents the design and development of the **Zero Hunger Mission App**. The app is aimed at reducing food wastage and feeding the underprivileged by creating a platform for food donations, tracking real-time food collection and delivery, and monitoring financial contributions. It uses the MERN stack (MongoDB, Express.js, React.js, Node.js) to create a scalable web-based system. This report covers the design methodology, technical implementation, and the impact of the app.

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2. Introduction

The Zero Hunger Mission is one of the United Nations' Sustainable Development Goals (SDGs), aimed at eradicating hunger by 2030. Many regions suffer from food wastage while others face severe food shortages. The app tackles this by providing a digital platform to connect food donors with distribution centers and volunteers who ensure the food reaches those in need. It focuses on making the donation process transparent, efficient, and scalable through technology.

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3. Objectives

The main objectives of the Zero Hunger Mission app are:

- **To enable food donation**: Providing an easy interface for households, restaurants, and food shops to donate surplus food.
- **Real-time tracking**: Ensuring food pickups and deliveries are transparent and traceable using live location tracking.
- **Volunteer Management**: Allow volunteers to sign up, collect, and deliver food to the needy or food hubs.
- **Donation Transparency**: Implementing live tracking of monetary donations and how the funds are used.

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4. Problem Statement

Despite abundant food resources, millions of people still suffer from hunger. On the other hand, food waste is a significant issue worldwide. The current systems for food donations and distribution lack transparency and efficiency, making it difficult for donors to ensure their contributions are effectively reaching those in need.

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5. Scope of the Project

This app is targeted at:

- Individuals who want to donate surplus food.
- Restaurants, food shops, and supermarkets with surplus food.
- Non-profit organizations that distribute food to the needy.

- Volunteers who can help collect and distribute the food. The app also allows for monetary donations and tracks the impact of both food and financial contributions in real-time.

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6. Methodology

a. Requirements Analysis

- **User Roles**: Donor (food shops, individuals), volunteers, non-profit organizations.
- **Features**: Real-time food pickup tracking, monetary donation management, volunteer task assignment, user registration and authentication.
- **Tools and Technologies**: MERN stack (MongoDB, Express.js, React.js, Node.js), Google Maps API, Socket.io for real-time updates, Stripe or PayPal for payment gateway integration.

b. System Design

- **Frontend**: Developed using React.js with a responsive UI for easy navigation across devices.
- **Backend**: Built using Node.js and Express.js to handle API requests for user management, donation tracking, and food collection assignments.
- **Database**: MongoDB for storing user data, donation information, and food pickup/delivery records.
- **Real-time Functionality**: Implemented using Socket.io to handle real-time updates for food pickups and deliveries.

c. Software Development

- **Frontend Development**: React.js is used to build the UI for donation pages, profile pages, and the real-time tracking dashboard.
- **Backend Development**: Node.js and Express.js manage API routes, authentication using JWT, and communication between the frontend and the database.
- **Database Setup**: MongoDB is used for storing user roles, donation information, and location data.

d. Algorithm Development

- **Task Assignment Algorithm:** Uses a Greedy algorithm with a priority queue and Haversine formula to assign tasks based on proximity.
- **Tracking Algorithm:** Uses WebSockets (Socket.io) for real-time updates and Geo-fencing for proximity-based notifications.

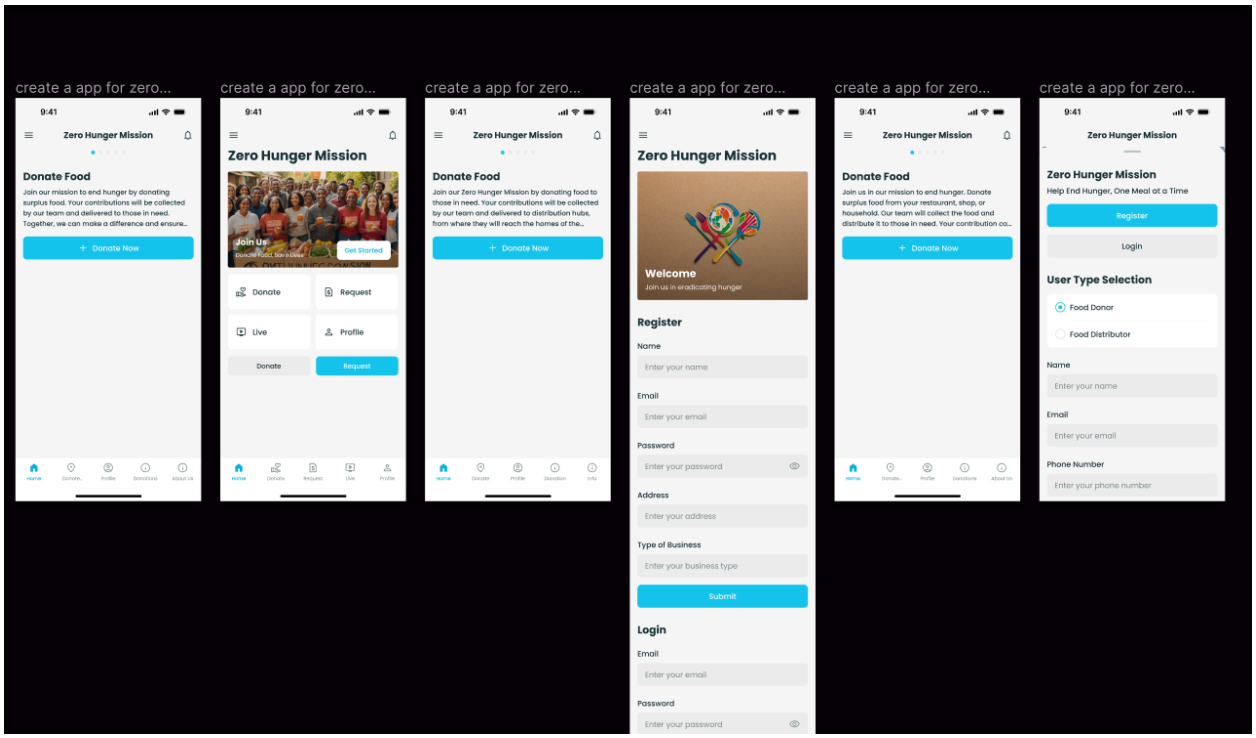
e. Integration and Testing

- **Unit Testing**: Testing individual components like login, donation forms, and location tracking.
- **API Testing**: Testing backend APIs for managing donations, real-time updates, and user authentication.
- **Integration Testing**: Ensuring smooth interaction between the frontend and backend components.

f. Iterative Improvement

Based on feedback from early users, the app was refined in areas like UI, performance optimization, and adding security enhancements to ensure user data protection.

g. Photos



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7. Technology Stack

- **MongoDB**: A NoSQL database for storing user data, donations, and delivery records.
- **Express.js**: Backend web framework used for creating RESTful APIs.
- **React.js**: Frontend framework for building a dynamic, interactive user interface.
- **Node.js**: Backend runtime environment to handle server-side operations.
- **Google Maps API**: For real-time location tracking of food pickups and deliveries.
- **Socket.io**: For real-time communication between the server and clients.
- **Stripe/PayPal**: For integrating payment gateways to accept monetary donations.

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8. Outcomes

- **Efficient Donation Process**: The app provides a user-friendly platform for food donations, ensuring that surplus food reaches those in need promptly.
- **Real-time Transparency**: Volunteers and donors can track food deliveries in real-time, ensuring transparency.

- **Monetary Donations**: The platform also accepts monetary donations and shows how funds are utilized through live tracking.
- **Volunteer Involvement**: Volunteers can view and accept pickup tasks, contributing directly to the mission.

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9. Conclusion

The Zero Hunger Mission App has successfully created a platform that bridges the gap between food donors and those in need. With real-time tracking, volunteer coordination, and transparent donation processes, this app plays a crucial role in

reducing food wastage while helping eradicate hunger. The app has the potential to scale and be deployed globally to create a greater impact.

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10. Future Scope :

- **Expansion of Features**

Future enhancements for the Zero Hunger Mission App may include advanced analytics to track donation patterns, user engagement metrics, and integration with local food banks, which will facilitate better resource allocation and improve overall efficiency in addressing hunger within communities.

- **Community Engagement Initiatives**

To foster community involvement, the app could implement features such as

volunteer sign-up options, local event notifications, and educational resources on food security, encouraging users to actively participate in hunger alleviation efforts and strengthen community ties.

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11. References

- MongoDB Documentation: https://www.mongodb.com/docs
- React.js Documentation: https://reactjs.org/docs
- Node.js Documentation: https://nodejs.org/en/docs
- Express.js Documentation: https://expressjs.com/
- Google Maps API Documentation: https://developers.google.com/maps/documentation
- Stripe Documentation: https://stripe.com/docs

Thank You