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Connecting Communities: A Mobile App for Bridging Food Surplus and Hunger

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Abstract

Food waste is a pressing global issue, especially when surplus edible food from restaurants, hotels, and events is discarded while millions go hungry. This project introduces an innovative digital platform that connects food donors with receivers in need, enabling real-time food availability posts along with location, type, and quantity details. The platform ensures that excess food reaches the hands of the hungry instead of landing in the trash. Instant, location-based notifications alert nearby receivers—including NGOs, food banks, and individuals—who can quickly respond and collect the food. Designed to be user-friendly, inclusive, and open to all, the platform empowers every citizen to take part in the fight against hunger. Our ultimate goal is simple yet profound: to ensure that even if not all, at least a few will no longer have to sleep on an empty stomach. By leveraging technology for social good, this project creates lasting impact and contributes to a more sustainable, humane world.

Keywords: *Digital Platform; Food Redistribution; Hunger; Real-Time Alerts; Sustainability.*

1. Introduction

Food nearly one-third of all food produced worldwide being discarded, while millions suffer from hunger and malnutrition (FAO, 2013). This paradox highlights inefficiencies in food distribution systems and underscores waste is a significant global challenge, with the urgent need for innovative, scalable solutions to address both food waste and food insecurity (Parfitt, Barthel, & Macnaughton, 2010; Papargyropoulou et al., 2014). Existing platforms such as Zomato Donation and Olia have attempted to facilitate food donation, but they remain limited in scope, adoption, and functionality. These applications often fail to provide a direct, real-time connection between food donors and receivers, which reduces their overall effectiveness (FAO, 2013; Papargyropoulou et al., 2014). This project proposes a user-friendly digital platform that connects food donors—including hotels, restaurants, and other establishments—with nearby receivers such as NGOs, food banks, and individuals in need. Donors can post real-time updates about surplus food availability, including details such as location, quantity, and type. Nearby receivers receive instant notifications and can promptly respond to collect the food, facilitating efficient redistribution and minimizing waste. Unlike existing solutions, our platform prioritizes a direct, real-time connection between donors and receivers through instant alerts. We emphasize the app's reliability and ease of use to ensure donated food reaches those who need it most. By facilitating timely food redistribution, this platform aims to make a tangible social impact, helping to alleviate hunger and ensuring that at least some individuals no longer have to go to bed hungry (Papargyropoulou et al., 2014).

1.1.Sub Section

Food waste is a major global problem, with nearly one-third of all food produced being wasted, while

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millions suffer from hunger and malnutrition worldwide (FAO, 2022). This shows a serious imbalance in food distribution systems. Although some apps like Zomato Donation and Olia exist to facilitate food donation, they are limited in reach and do not always offer real-time connections between donors and receivers, reducing their overall impact (Parfitt et al., 2010; Gustavsson et al., 2011). [1]

1.2.Sub Section 2

Our project proposes a simple, user-friendly digital platform that connects food donors — such as hotels and restaurants — with nearby receivers including NGOs and individuals in need. Donors can post real-time updates about surplus food availability, and nearby receivers get instant notifications, allowing quick collection. Unlike existing solutions, our platform prioritizes direct, real-time communication to improve food redistribution, helping reduce waste and alleviate hunger more effectively.

2. Method

The proposed system is an Android-based mobile application developed using React Native for the front end and Firebase for real-time database management and authentication. The application features a unified login interface accessible by both donors and receivers. Upon logging in, users are directed to a home page with distinct options for donors and receivers. Donors can post available surplus food by providing information such as type, quantity, and location. This data is stored in Firebase and immediately triggers real-time notifications to nearby registered receivers. Receivers, including.

Note: Both donor and receiver functionalities are integrated within a single Android application interface. (Table 1) [2] NGOs, food banks, and individuals, receive these alerts and can respond to claim the food. The real-time communication is enabled using Firebase's cloud messaging and database triggers, ensuring timely and efficient food redistribution. The app's architecture is optimized for ease of use, quick navigation, and scalability. (Table 2)

2.1.Table

Table 1 Functionality of the Application for Donors and Receivers

Feature	Donor Functionality	Receiver Functionality
Login System	Shared login page for all users	Shared login page for all users
Home Interface	Access to food donation section	Access to food request section
Food Entry	Submit surplus food details (type, quantity, location)	—
Real-time Notifications	—	Receives instant alerts when food is available
Interaction	View and respond to receiver requests	Request and confirm food collection

Table 2 Functionality of the Application

User Role	Functionality	Technology Used
Donor	Login via common portal Post food availability (type, quantity, location)	React Native, Firebase Auth
Receiver	Login via common portal Receive real-time alerts of available food nearby Request food and view donor location	React Native, Firebase DB Firebase Cloud Messaging Firebase DB, Maps API
Both	Accessible via single Android application interface	React Native

Note: Both donor and receiver functionalities are integrated within a single Android application interface.

2.2.Figures

Internal testing showed consistent performance, suggesting the system is technically sound. However, as user testing has not yet been conducted, real-world feedback will be crucial to evaluate usability and effectiveness. Future enhancements may focus on improving location accuracy, adding real-time features.

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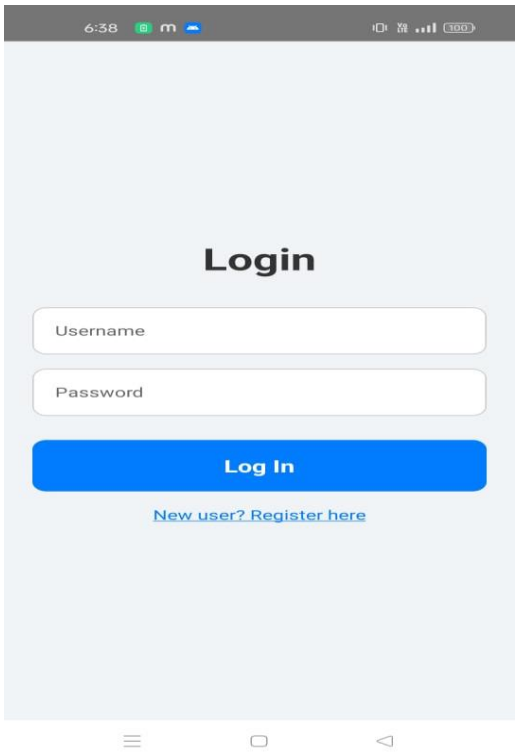

Figure 1 This is the Login Page if the User is Existing They Can Login Directly

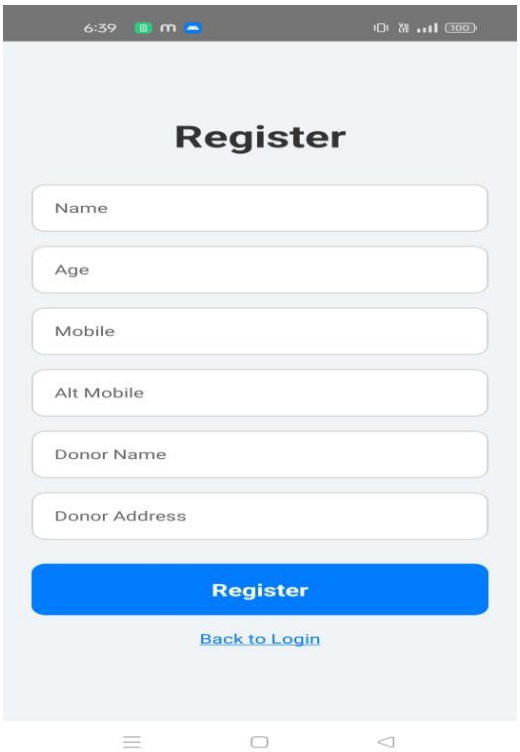

Figure 2 This is the Registration Page for New Users

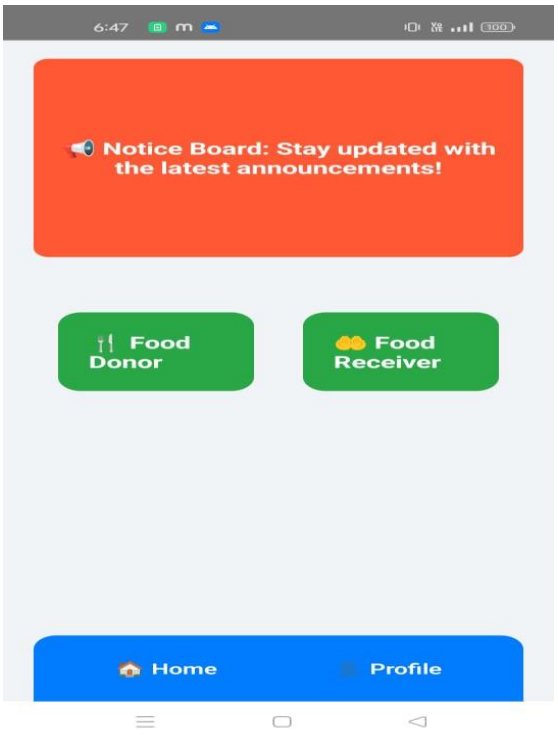

Figure 3 This is the Home Page of the Application

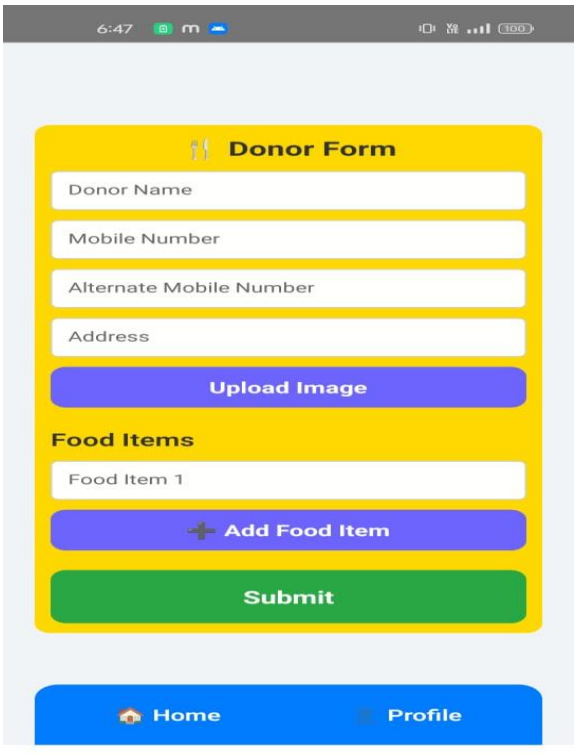

Figure 4 This is the Donor Page of the Application

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3. Results and Discussion

3.1.Results

The food waste management application was successfully developed to streamline the process of connecting donors with receivers. Core modules include user authentication, role-based navigation, and donor-specific functionalities.

- Figure 1 shows the Login Page, enabling secure access for registered users.
- Figure 2 displays the Register Page, where new users can sign up as a Donor or Receiver.
- Figure 3 presents the Home Page, providing role selection for user navigation.
- Figure 4 illustrates the Donor Page, featuring input fields for food item details, tested with default values during development.

Internal testing confirmed smooth navigation, functional input validation, and proper data flow between interfaces. The application is now ready for further user-level testing and deployment. [3]

3.2.Discussion

The developed application demonstrates a functional and user-friendly approach to addressing food waste. Its clear role-based navigation and structured donor interface provide a practical framework for real-world use. Internal testing showed consistent performance, suggesting the system is technically sound. However, as user testing has not yet been conducted, real-world feedback will be crucial to evaluate usability and effectiveness. Future enhancements may focus on improving location accuracy, adding real-time features, and refining the user experience based on field data. The results indicate strong initial potential, laying the groundwork for a meaningful and scalable solution to food distribution challenges.

Conclusion

The present work confirms that food waste is a critical issue that can be mitigated through innovative technological interventions. The developed application effectively facilitates the connection between food donors and receivers, offering a streamlined and user-friendly platform for food redistribution. Internal evaluations have demonstrated the system's robust functionality and intuitive design, underscoring its potential to significantly reduce food wastage. Although further validation through real-world user engagement is required, the application establishes a strong foundation for scalable implementation. Overall, this solution represents a valuable step toward addressing food insecurity and promoting sustainable resource management within communities.

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