

# Share meal: Waste Food Management and Donation Application

Sandhya M

Computer Technology Bannari  
Amman Institute of technology  
Sathyamangalam, Erode

Raghul C

Computer Technology Bannari  
Amman Institute of technology  
Sathyamangalam, Erode

Kishore S

Computer Technology  
Bannari Amman Institute of  
technology  
Sathyamangalam, Erode

Anandan P

Computer Technology  
Bannari Amman Institute  
of technology  
Sathyamangalam, Erode

**Abstract** - Food waste is a significant worldwide problem that feeds the world's needy while exacerbating environmental and economic issues. Our Share meal app works to reduce food waste and facilitate food contributions in order to close the gap. It links donations with potential beneficiaries, such as shelters or those in need, using an intuitive smartphone interface. Donators can use the application to post extra food by providing details like the type, weight, vehicle type, address, and location. Recipients who can browse these postings and arrange for pickup or delivery within a given time window guarantee food safety and efficient distribution. This Share meal app has the potential to significantly reduce food waste, reduce hunger, and promote a more sustainable food system.

**Keywords** – Food Waste Management, Food rescue/food donation app, App for mobile hunger relief, Resiliency

## I. INTRODUCTION

Millions of people worldwide go hungry each year as an incredible amount of food is wasted. This paradox shows how creative solutions are needed to close the gap between surplus and insecurity in food. The Waste Food Management and Donation Application, a mobile application created to address this issue, is presented in our project.

Helping donators, beneficiaries, and a designated rider intermediary coordinate smoothly is the aim of the waste food management and donation application. Donators and those in need can effectively connect via this network, and a rider serves as a middleman to smooth the transfer of donated food. Important details like donator addresses, gift history (including finished and pending donations), and comprehensive records of the food donated—which may include photos for verification—are all accessible to the rider. Donators are given access to the process, allowing them to monitor the progress of their contributions and see past information. Notifications are delivered to both the donator and the rider when a rider requests a food pickup, guaranteeing prompt coordination and communication.

Furthermore, the integration of map functions facilitates the visualization of pickup and drop-off locations for all parties concerned, hence augmenting efficiency and transparency in the donation process.

Our Waste Food Management and Donation Application Share meal seeks to accomplish multiple important objectives by facilitating a direct relationship between donator and recipients:

**Reduce food waste:** The Share meal app minimizes environmental effect by diverting edible food from landfills by matching people in need with those who have extra food.

**Fight Hunger:** By ensuring those who need it most, the Share meal app helps create a more just and equitable food system.

**Encourage sustainability:** The Share meal app helps create a more sustainable food future by lowering food waste and encouraging responsible consumption.

**Boost community involvement:** By promoting involvement in food rescue initiatives, the app can help people develop a feeling of community and social responsibility.

We think there's a good chance this creative application will have a big beneficial effect. In addition to reducing food waste and reducing hunger, it will encourage our communities to consume food in a more thoughtful and responsible manner.

## II. LITERATURE SURVEY

Food hunger and food waste are two topics that have drawn a lot of attention to waste food management and donation applications in recent years. The goal of this review of the literature is to shed light on the latest findings, difficulties, and prospects in the subject of waste food management and donation applications.

Several apps deal with donating and managing food waste. Usually, these apps link food donator and recipients—individuals or groups—who are looking for contributions of food. Studies conducted on these

applications reveal:

**Functionalities:** Standard features include a matching system to link donator and recipients, a food listing with information (kind, quantity, location), and donator and recipient registration

**Pay Attention to the User Experience:** Research indicates that an easy-to-use interface and a smooth contribution procedure are essential for app uptake.

The creation of mobile applications for food donation and trash management has accelerated recently as a potential remedy for the problems of hunger and food waste. Examining research efforts and developments in this field is the goal of this review of the literature, which focuses on two noteworthy works by Katakam Sudheepa et al. (2023) and Shola Usharani et al. (2023).

In order to develop a mobile application that can effectively gather and distribute donated food and other supplies, Katakam Sudheepa et al. (2023) set out on a research study. Using mobile smartphones, the software enables both donator and recipients to enter their information and share information about the availability or demand of food. This application is notable since it can handle both cooked and raw meals. Moreover, by posting images of their meals on the app, donator can use it to convince others to donate by showcasing the abundance of extra food.

The incorporation of non-governmental organizations (NGOs) into a mobile application was suggested by Shola Usharani et al. (2023) as a way to expedite the feeding of the underprivileged. A "food quality tester" using sensors and an Arduino board was also added, bringing a fresh element to the program. This function allows delivery workers to evaluate the hygienic and nutritional value of the food they retrieve from a variety of establishments, such as homes, cafes, and restaurants. By lowering food waste and reducing hunger, the authors stress that their approach supports sustainable development objectives.

The relevance of mobile applications in waste food management and donation initiatives is highlighted by the studies conducted by Katakam Sudheepa et al. (2023) and Shola Usharani et al. (2023). By bringing together surplus food producers and those in need, these apps provide workable solutions that address the problems of food waste and food insecurity. In order to improve the efficacy and scalability of these mobile applications in addressing hunger and food waste worldwide, further study and cooperation across stakeholders are required.

### III. DESIGN AND IMPLEMENTATION

There are three Target Users in the "Share meal" proposed solution:

**Donator:** This group comprises people who have extra food that they would like to contribute, as well as eateries and supermarkets.

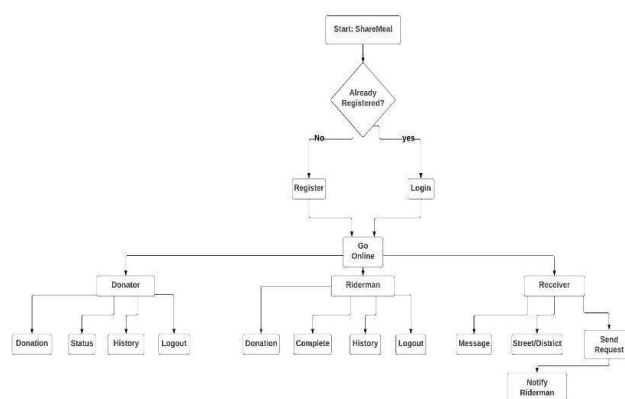
**Recipients:** Organizations that provide shelter, individuals facing food insecurity, and shelters in need of donated food.

**Rider men/rider women:** A rider can check available donation requests in the application after initiating a donation. Via the app, the rider chooses a donation request and makes a pickup request.

The features of the app are as follows:

**User Login and Registration:** In order to guarantee that every user has a profile that is appropriate for their function, the program will provide distinct registration methods for donators, rider man and recipients.

During the registration process, donator and rider man will need to supply information about themselves, including name, contact information, and location etc. Along with providing their name, contact information, and any special dietary needs or preferences, recipients must register.



**The Donor Starts the Donation:** By supplying information about the food goods, they want to contribute, the donor starts a contribution using the program.

**Rider Inquiries About Pickup:** A rider can check available donation requests in the application after initiating a donation. Via the app, the rider chooses a donation request and makes a pickup request.

**Notification of the Rider and Donor:** Notifications are delivered to the rider when a recipient requests food.

**Rider Approval:** The rider authorizes the pickup after reviewing the donor's contribution.

**Rider Gains Access to Donor Details:** Through the application, the rider is granted permission to view the donor's address and donation history.

**Rider Picks Up Donation:** The rider goes to the donor's place and retrieves the food donations.

**Rider and Donor Update Donation Status:** To indicate whether the pickup is finished, both the rider

and the donor update the donation status in the application. using an image.

V. PROPOSED WORKFLOW II

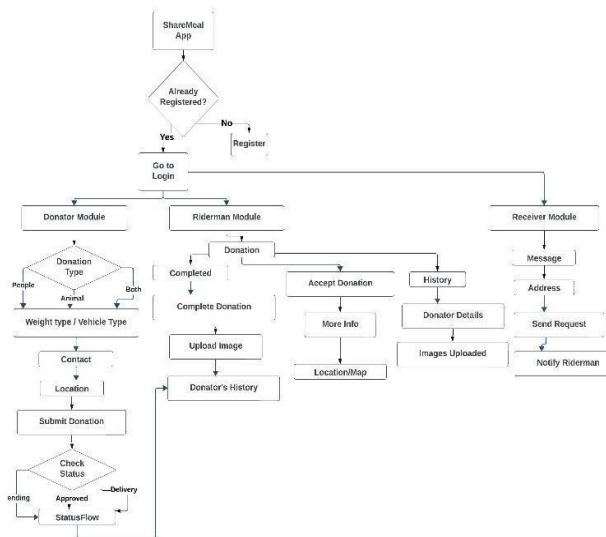
**Donation Delivery:** The rider brings the food donations to the person who has been assigned.

**The Affected Party Gets Donation:** The motorcyclist gives the food supplies to the recipient.

**Maps Location View:** During the procedure, the rider can use the application's map feature to see the recipient's and donor's current locations.

**Donor Feedback:** Using photos, the donor may submit comments regarding the pickup and delivery experience following donation delivery.

**Completion Notification:** When the donation procedure is over, the giver and the recipient receive a green signal indicating that the food donations were successfully delivered.



IV. DEVELOPMENT TOOLS AND TECHNOLOGIES

Establish a strong basis for creating a frontend and backend Android Studio, Java, and Firebase application for managing waste food and donations. Here's a summary of some tools and technologies you may want to use:

**Android Studio:** The official IDE for Android development is Android Studio. Along with features like code completion, debugging, and an extensive layout editor, it offers a stable environment for developing Android apps.

**Java:** The main programming language used to create Android apps is Java. Java has a large user base, copious documentation, and active community support.

**Firebase:** Google's all-inclusive platform for developing mobile and web applications. For both frontend and backend development, Firebase provides a range of services, such as: **Firebase Authentication:** For managing and authenticating users. For storing and syncing data in real-time between clients, use Firebase Realtime Database, also known as Cloud Firestore. Depending on what your app needs, you can pick between the Realtime Database and Cloud Firestore.

**Firebase Storage:** For keeping track of papers and other user-generated stuff.

**Firebase Cloud Functions:** For backend logic that is serverless. Cloud Functions can be used to run custom backend code in response to HTTPS requests and Firebase capabilities.

**Google Maps API:** Include Google Maps in your application to offer location-based services to users. This can assist users in finding food pickup locations or donation centers nearby.

**Payment Gateway Integration:** To enable easy and safe payments, if your application handles donations or financial transactions, you might want to integrate a safe payment gateway such as PayPal or Stripe.

**App Initiation:** Users are prompted to Register or Login when the app first launches.

**Enrollment:** Select "Register" when logging in for the first time as a new user. Afterward, they select whether to act as a "Donator", "rider man" or a "receiver".

**Current Clientele:** Anyone with an existing account can just "Login" with their login information.

APP FUNCTIONALITY:

Once registered/logged in, donator, rider man and receivers have access to different app functionalities:

THE DONATOR FLOW:

- Donator details:** Donator begin by entering their contact details under "Donation".
- Type of Food:** Donator name the kind of food they would want to contribute (only people, only animals or both).
- Vehicle Type:** It is advisable for donors to think about the kind of car that would work best to deliver their donation to the recipient. This option will specify how much can be delivered in a single trip. Making the right car choice guarantees that the donated goods are delivered to the recipient quickly and effectively.
- The location-view** maps feature allows donator to more easily coordinate pick-up by using an integrated map (latitude and longitude) to locate their position.
- Quantity:** The quantity of food that donator are contributing is specified.
- Contact:** Donator give their contact information so that rider man can get in touch with them

**Donor Perspective on Food Donation Situation:** The donor can keep track of the donated food's status on the status page, including whether it has been authorized, is pending, or is on its way to be delivered. The donor can

effectively monitor the advancement of the donation process with the help of this function.

**Logout:** After using the app, donator can exit it.

### RIDER MAN OR RIDEN WOMEN FLOW:

1. **Rider Information Procedure for Registration:** In order to begin the registration process, riders must first provide their personal details, such as their name, email address, phone number, kind of vehicle, registration number, ID number, and password. By taking this action, riders may be guaranteed they can access the platform and start providing their services right away.
2. **Rider Access to Contributor Information:** Information about food donations, including information about the individuals who provide the food items, is available to riders. Riders can effectively handle and deliver the donations to the designated recipients with the use of this information.
3. **Completing Donation with Image Upload:** Riders can finalize the donation process by uploading images through our platform to confirm the delivery of food to the receiver. This feature allows donors to track the status of the delivery and ensure that the donation reaches its intended recipient.
4. **Viewing Donation History with Images:** Riders have the capability to access the history of each donation through images, providing a visual record of all donations made by donors. This feature allows for a comprehensive overview of the donation process, enhancing transparency and accountability in the donation workflow.
5. **Logout:** After using the app, donator can exit it.

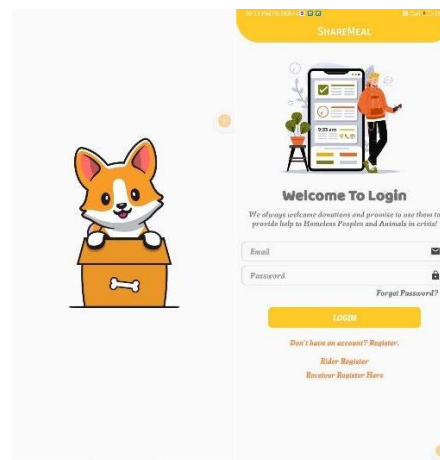
### VOLUNTEER/RECIPIENT MOVEMENT:

1. **Receiver Request Process:** On the receiver's end, they can input a message and address specifying the desired area for food delivery. Upon requesting food, the message and address details are sent via notification to a designated rider for prompt action and delivery coordination.
2. **Logout:** After using the app, volunteers and recipients can log out.

### OVERALL FLOW:

Donors first provide their contact information and indicate the kind and amount of food they would want to donate. Additionally, they can choose the right kind of truck for effective delivery. Upon registering, riders can access donor details, finalize donations by uploading images, and see their donation history. By sending a message and address, recipients can request meals, and a rider can coordinate delivery. After utilizing the app, all users can log out to ensure smooth communication.

## VI.IMPLEMENTATION



Starting page of the “Share meal”

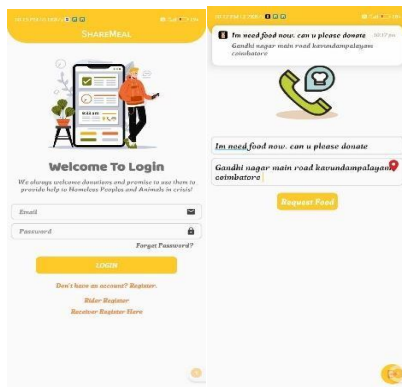


Rider man page of the Share meal



Donator page of the share meal





Receiver page of the share meal

VII.ADVANTAGES:

- Food Waste Reduction: The primary benefit of the “Share meal” application is a reduction in food waste by making it simpler to give extra food to people in need.
- Cost savings: By distributing food to recipients that would otherwise end up in landfills, the program helps businesses save money on disposal fees while also providing vital resources to communities.
- Social Impact: The “Share meal” application advances social welfare by addressing food insecurity, increasing access to healthful food, and fostering community engagement and solidarity.
- Efficiency Gains: When food donation and administration processes are improved by automation and real-time tracking, donator, recipients, and administrators all see efficiency gains.
- Accountability & Transparency: Greater transparency and accountability in Food donation programs increase participation in food drives and strengthen stakeholder confidence.

VIII.RESULTS

The goal of the "Waste Food Management and Donation Application" project is to link a individual as well as NGO’s and donator in order to efficiently manage food waste and enable donations to those in need. Individuals can use the app to sign up, log in, add meal specifics, and rider admin pickups of donations for causes like impoverished areas and orphanages. To expedite the procedure, the system has a real-time database. Peoples can browse available food donations, receive alerts for food collection, and keep track of donator, rider and donator information by logging onto the platform. Additionally, the application includes a transit feature whereby the administrator sets up food delivery to beneficiaries by arranging for food pickup from donator through local agents.

IX. CONCLUSION

The waste food management and donation application is a creative way to tackle the global issue of food waste while also assisting those in need. Despite the staggering 1.3 billion tons of food lost annually, the network which is powered by technology effectively connects leftover food from businesses with non-governmental organizations and people who are experiencing food shortages. Because the program guarantees transparent transactions and streamlines the contribution procedure, it has a significant impact on social welfare and environmental sustainability. It also reduces waste and provides underprivileged populations with the essential nourishment they require. Despite challenges including data integrity and connectivity issues, this program represents a significant step toward creating a more equal and efficient food delivery system. It stands for the power of ingenuity and neighborhood collaboration in the struggle against hunger and food poverty. It also gives hope for a time when surplus food is given to the less fortunate, fostering a more compassionate and sustainable society for all.

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