The Waste Food Management and Donation App

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Abstract - Food waste is a pressing global issue, contributing to environmental degradation and societal inequality. Simultaneously, millions of individuals suffer from hunger and malnutrition. This project presents a comprehensive solution through the development of a Waste Food Management and Donation Application designed to bridge the gap between surplus food generators and recipients. The application enables restaurants, hotels, supermarkets, households, and event organizers to list excess edible food in real-time, while NGOs, charitable organizations, and individuals in need can access and claim these donations efficiently. The system is built using a robust backend powered by SQL for data management, with a user-friendly interface developed using HTML, CSS, JavaScript, and PHP. Key functionalities include real-time food listing, location-based search and matching, user authentication, notification systems, and a rating mechanism to ensure quality control. The platform not only minimizes food wastage but also fosters a collaborative ecosystem of donors and beneficiaries, promoting social responsibility. Extensive security measures have been implemented to protect user data and ensure ethical usage. The application also provides analytical insights to donors about their contribution impact over time. By offering a structured, technology-driven approach to food redistribution, this project contributes significantly toward sustainable development goals, addressing both hunger eradication and waste reduction in a systematic, scalable manner.

*KeyWords***:**

Sustainable Development, Surplus Food Redistribution, Mobile Application, Social Responsibility, Data Security.

1. INTRODUCTION

Food wastage and hunger coexist as persistent global issues. This project proposes a digital solution through a Waste Food Management and Donation App, enabling efficient redistribution of surplus food via real-time tracking, location-based matching, and community-driven participation to promote sustainability and social impact.

2. PROPOSED SYSTEM

The Waste Food Management and Donation App is built to address the global challenge of food waste by connecting food donors with beneficiaries in need. The application is developed using XAMPP, a local server environment that integrates Apache, MySQL (SQL), and PHP, making it easy to set up and manage the system during development and deployment.

The system architecture relies on a PHP backend that processes user requests and manages the application logic. SQL is used to handle data storage, including user profiles, food donation listings, and transaction histories. JavaScript adds interactivity to the application, enabling dynamic food listings, user interaction, and notifications. The frontend is built with HTML and CSS, ensuring a responsive, user-friendly interface that allows users to easily navigate the platform.

Donors can post surplus food, which is matched with nearby recipients based on location, food type, and availability. The application uses geolocation services to track food donations and recipients in real-time, ensuring efficient coordination of food transfers. A built-in rating system helps maintain trust between users by allowing them to provide feedback on food quality.

Security is a priority in the system, with authentication protocols implemented to verify user identity and encryption to protect data. The platform also supports scalability, with future enhancements planned, including the use of machine learning to predict food donation trends and optimize the matching process.

The app aims to reduce food waste, alleviate hunger, and foster community engagement, contributing to both environmental sustainability and social well-being.

3. BLOCK DIAGRAM:
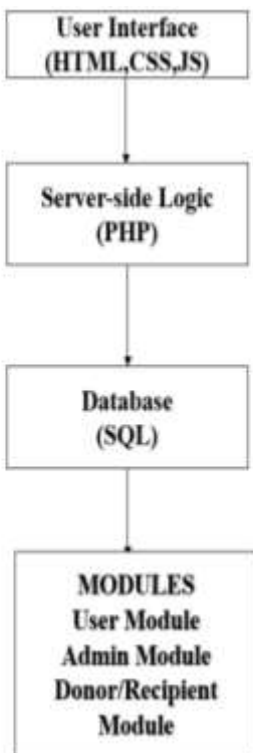
The block diagram for a waste food management and donation app typically consists of several key components that work together to facilitate the donation process. The detailed explanation of each component:

➢ *User Interface (HTML/CSS/JS):*

Purpose: This is the front-end part of the application that users interact with.

Technologies Used:

- **(HyperText Markup Language):** Defines the structure of the web pages.

- **CSS (Cascading Style Sheets):** Used to style the HTML elements, making the UI attractive.

- **JavaScript (JS):** Adds interactivity and dynamic features to the interface (e.g., form validation, live updates).

Function: Captures user input and displays information fetched from the backend.

➢ *Server-Side Logic (PHP):*

Purpose: Acts as the middleware that processes user requests from the front-end and interacts with the database.

Technology Used: PHP (Hypertext Preprocessor)

Function:

- Handles form submissions, authentication, session management.

- Implements business logic like who can donate, who can approve, etc.

- Sends queries to the database and returns results to the front-end.

➢ *Database (MySQL):*

Purpose: Stores and manages all the data required by the application.

Technology Used: SQL-based database (e.g., MySQL, PostgreSQL)

Function:

- Stores user details, donations, requests, approvals, etc.

- Handles CRUD operations (Create, Read, Update, Delete) via SQL queries executed by PHP.

> *Modules:*

This section represents the main functional components or sub-systems of the application, drive by the database. It consists of:

- **User Module:**

  o Allows users to register, login, submit requests or donations.

  o Manages user profile and interaction history.

- **Admin Module:**

  o Enables admins to monitor, verify, approve or reject user activity.

  o Manages system settings and oversees all other modules.

- **Donor/Recipient Module:**

  o Specific to individuals or entities donating or receiving food/items.

  o Donors can post available items; recipients can request or claim items.

4. ARCHITECTURE:
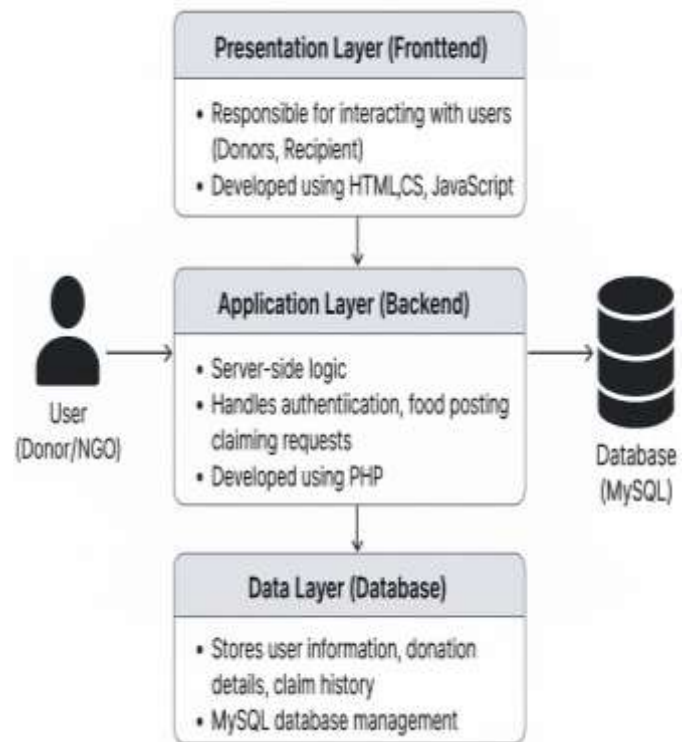
The architecture follows three-tier model:

1. Presentation Layer (Frontend):

- Responsible for interacting with users (Donors ,Recipients, Admin)

- Developed using HTML, CSS, JavaScript

2. Application Layer (Backend):

- Server-side logic

- Handles authentication, food posting, claiming requests

- Developed using PHP

3. Data Layer:

- Stores user information,donation details,claim history.

- MySQL database management

5. IMPLEMENTATION:

The implementation process of the food donation system begins with setting up the environment. XAMPP, which includes Apache, MySQL, and PHP, is installed to create a local development environment. The necessary services (Apache and MySQL) are started, and a database named food_donation_db is created using phpMyAdmin.

The next step is database design using SQL. Three tables are created: users, which stores donor and volunteer details; donations, which records food donations and their statuses; and requests, which tracks volunteer collection of donations. Relationships are established between these tables using foreign keys to ensure data integrity.

For user authentication, PHP and MySQL handle registration and login. The system securely stores user passwords using hashing and verifies credentials during login. Upon successful authentication, users are redirected to their respective dashboards based on their roles (donor or volunteer).

Donors can upload food donations through an HTML form. The details, including food type, quantity, expiry date, and location, are stored in the database. Volunteers can then view available donations on their dashboard. When a volunteer accepts a donation, a record is created in the requests table, and the donation status is updated to "claimed."

To maintain efficiency, an expiry and matching algorithm is implemented. A script automatically marks expired donations as "expired." A basic matching algorithm assigns a volunteer randomly to an available donation, ensuring quick pickup.

The system's frontend enhancements include styling with Bootstrap for a better user experience, JavaScript for real-time updates, and integration with the Google Maps API for location tracking. These features improve usability and accessibility.

Finally, the system undergoes testing and deployment. It is tested locally using XAMPP before deployment on a live server such as 000webhost, Hostinger, or AWS.

Future improvements include a notification system for real-time updates, AJAX-based real-time tracking, and an admin dashboard for better monitoring and management of donations.

6. OPERATING PROCEDURE:

The Waste Food Management and Donation App follows a structured and efficient workflow to ensure that surplus food is quickly and safely donated to people in need. The operating procedure involves multiple stakeholders, including food donors, recipients, and logistics coordinators. This section provides a detailed step-by-step explanation of how the application operates from both the donor's and recipient's perspectives.

6.1 Steps for Food Donors:

Food donors can be individuals, households, restaurants, supermarkets, or food manufacturers who have excess edible food that they wish to donate. The app simplifies the process and ensures that food reaches those in need before it expires.

Step 1: User Registration and Profile Creation

- The donor must download and install the app on their smartphone.
- Upon launching the app, the donor needs to register using a valid email ID or mobile number.
- The app provides an option for Google/Facebook sign-in for convenience.
- The donor must then fill in basic profile details,including:

  ✓Name

  ✓Address & Location (GPS-based)

  ✓Preferred Contact Information

  ✓Type of Donor

Step 2: Listing Available Food for Donation

- Once logged in, the donor can click on "Add Food" to list available food items.
- The app prompts the user to enter the following

details:

✓Type of food

✓ Quantity available

✓Pick up time and location

✓ Food Image (optional but recommended)

The app uses an AI-based expiration date checker to alert donors if the food is too close to expiry and not suitable for donation.

Step 3: Food Matching & Recipient Notification

- Once a food item is listed, the system automatically matches it with a nearby recipient:

  ✓ Food type preferences

  ✓ Geographical proximity

  ✓ Urgency of recipient requests.

- A push notification is sent to the nearest recipient to claim the donation.

Step 4: Confirmation & Pickup Coordination

- If a recipient accepts the donation, the donor receives a confirmation message.

- The recipient and donor coordinate the pickup location and time via in-app messaging or automated scheduling.

- The app also provides an option to request a volunteer for food pickup in case the donor cannot deliver.

Step 5: Donation Completion & Reward

- Once the recipient collects the food, the donor marks the donation as completed in the app.

- The recipient is prompted to provide feedback (optional) about the food condition.

- Donors earn reward points for each successful donation, which can be redeemed for:

  ✓ **Discounts on groceries and restaurants**.

  ✓ **Recognition badges for social impact contributions**.

✓ **Tax benefits for businesses (if applicable in their region)**.

6.2 Steps for Food Recipients:

Food recipients can be individuals in need, NGOs, community kitchens, homeless shelters, orphanages, or food banks that rely on food donations. The app provides a seamless way for them to receive food safely and efficiently.

Step 1: User Registration and Verification

- Recipients must register and create a profile in the app, providing:

  ✓ Name / Organization Name

  ✓ Location (GPS-based)

  ✓ Type of Recipient (Individual, Shelter, Food Bank, etc.)

  ✓ Food Preferences (Vegetarian, Halal, Kosher, No Preference)

  ✓ Contact Information

Step 2: Searching for Available Food

- Recipients can browse available food donations on the app.

- They can filter donations based on:

  ✓ Food type (Cooked, Packaged, Fresh, etc.)

  ✓ Proximity to their location

  ✓ Availability (Immediate pickup or scheduled pickup)

Step 3: Claiming a Food Donation

- When a recipient finds a suitable food donation, they can claim it by clicking "Request Pickup".

- The app asks for a confirmation to prevent false claims.

- If the donation is still available, the system matches the recipient with the donor and

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provides the pickup details.

Step 4: Coordinating Pickup & Delivery

- Recipients receive pickup instructions via in-app notifications and messages.
- The app provides an interactive map with real-time directions to the pickup location.
- In case the recipient cannot travel, the app provides an option to request a volunteer delivery.

Step 5: Receiving the Donation & Feedback Submission

- Upon collecting the food, the recipient marks the transaction as completed in the app.
- The app prompts the recipient to rate the donation based on quality and quantity.
- If there is an issue (such as spoiled or insufficient food), the recipient can report it.

6.3 Steps for Admin:

Step 1: Login as Admin

- Enter the admin credentials to access the dashboard.

Step 2: Dashboard Overview

- After logging in, the admin is taken to the Dashboard page, which displays:
- Total Users: Number of users registered on the platform.
- Feedbacks: Number of feedback messages received from users.
- Total Donates: Total number of food donation entries recorded in the system.

Step 3: Navigation Menu

- Dashboard: Main summary of stats and recent donations.
- Analytics (if available): Insights about donation trends and user activity.
- Donates: View and manage all food donation entries.
- Feedbacks: View user-submitted feedback.
- Profile: Admin profile details and account settings.
- Logout: Sign out of the admin panel.
- Dark Mode Toggle: Switch between light and dark themes.

Step 4: Recent Donations Table

- Displays the list of most recent donations with the following fields:
- Name: Donor's name.
- Food: Number of food packs or items.
- Category: Type of food (e.g., packed-food, cooked-food).
- Phone No: Donor's contact number.
- Date/Time: Timestamp of the donation.
- Address: Location of the donor.
- Quantity: Amount of food in units like kg or packs.
- Get Food Button: Option to claim or mark food as collected.

Step 5: Admin Actions

- Verify donations: Check if donation details are valid before approving.
- Contact donors: Use the provided phone number to coordinate pickup or delivery.
- Monitor expiry: Ensure food is distributed before it expires.
- Collect feedback: Use feedback to improve service quality and user satisfaction.

Step 6: Food Collection

- Admins can click the "Get Food" button beside each donation entry to mark it as collected or to initiate the collection process.

Step 7: Logout

- Click on the Logout button in the sidebar to securely exit the admin dashboard.

7. RESULT:

The Waste Food Management and Donation App has successfully bridged the gap between food donors and recipients, providing a simple, efficient, and scalable solution to food wastage. The key accomplishments of this project include:

• The Developing a real-time matching system for food donors and recipients.

Ensuring rapid pickup and delivery to prevent food spoilage.

• Encouraging community participation through reward-based incentives.

• Promoting environmental sustainability by reducing food waste and landfill waste.

• Integrating AI and GPS tracking for efficient food distribution.
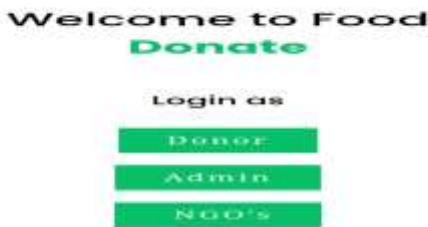
Fig 7.1 : Food Donation Portal - User Login Selection
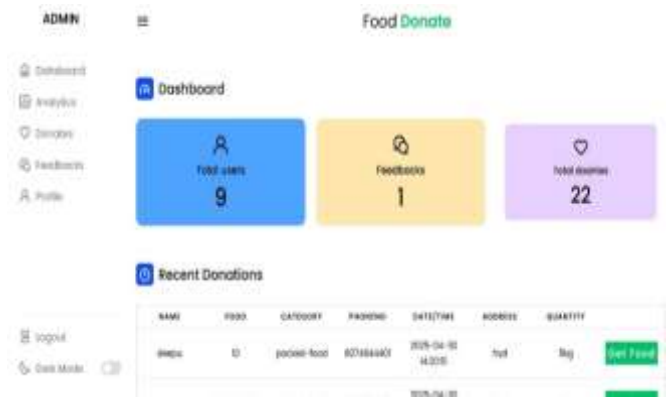

Fig 7.2 : Food Donation Mobile Interface
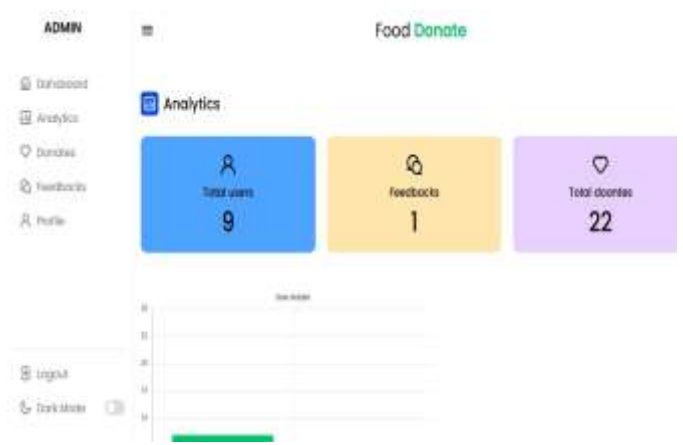

Fig 7.3 : Admin Page-Dashboard

Fig 7.4 : Admin Page -Analytics

Fig 7.5 : Admin Page -Donates

Fig 7.6 : Admin Page: Feedback

Fig 7.7 : Admin Page-profile

Fig 7. 9 :Result-If the order is assigned to someone

8. CONCLUSION:

The *Waste Food Management and Donation App* was developed with the goal of reducing food wastage and connecting food donors with organizations and individuals in need. Through this project, we created a platform that promotes social responsibility, environmental sustainability, and community support.

The application provides an efficient and user-friendly interface for users to donate surplus food, track donations, and ensure timely distribution to the needy. By bridging the gap between food waste and food scarcity, the app contributes to building a more compassionate and sustainable society.

Overall, this project highlights the potential of technology in addressing real-world problems.

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