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SERVEPLUS – a System to Reduce Food Wastage

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Abstract:

Food wastage is a major issue that affects both the environment and people who do not have enough to eat. This paper introduces ServePlus, a website that helps to reduce food waste by connecting people who have extra food with those who need it, such as NGO's, hotels and community kitchens. This platform is built using Django and offers features like user login, food donation forms, pickup requests, and location-based services. It makes the food donation process easy, safe, and quick.

Keywords — **Food Wastage Prevention, Zero Waste Initiative, Food Donation Platform, zero waste Initiate, Django Web App.**

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I. INTRODUCTION

Food wastage is one of the most serious yet often overlooked global problem. While millions of people go to bed hungry each night, large quantities of perfectly edible food are thrown away daily by households, restaurants, hotels, supermarkets, and event organizer. This food, if redirected, could help fight hunger, reduce environmental damage, and support community in need.

This ServePlus is a web-based platform built using Django that helps to reduce food wastage by connecting people who have extra food with those in need. The goal of this project is to hungry or needy people nearby. Users can sign up as donors or receivers. Donors can post food details, and receivers or NGOs can request it. The system matches them based on location and availability. ServePlus promotes sustainable living, reduces food waste, and support communities through food sharing.

The platform supports location-based matching, allowing donors and receivers to find each other easily. Donor can post available food details, set pickup time and location, and track the status of their donation. Receiver's such as NGOs or individuals in need, can browse available food, send requests, and receive food without any middleman.

By digitizing the food donation process, ServePlus encourages responsible behaviour, promotes community well-being, and contributes to the border goals of sustainable development. It empowers people to be part of a movement that not only saves food but also brings dignity and hope to the lives of the hungry.

This platform is designed with user-friendly features and clean interface to ensure that both tech-savvy users and those with limited digital experience can easily navigate it. With proper verification processes and real-time updates, ServePlus ensure that donation reach genuine recipients safely and efficiently.

II. LITERATURE REVIEW

Food wastage has emerged as a significant global concern, with both environmental and humanitarian consequences. According to the United Nations Environment Programme (UNEP), approximately one-third of all food produced globally is wasted, despite millions suffering from hunger and malnutrition. This paradox has led to the development of several technological solutions aimed at redistributing surplus food to those in need.

Existing platforms like **Feeding India**, **Robin Hood Army**, and **Replate** have made impactful strides in food donation. These organizations rely heavily on manual coordination and volunteers to collect and distribute food. While effective in their respective regions, many lack automation, real-time tracking, and tailored donor-recipient matching, which limits scalability and efficiency.

Academic research has explored different models of food redistribution using mobile and web-based platforms. Some studies focus on logistics optimization using machine learning algorithms, while others discuss real-time inventory systems for perishable goods. A common limitation identified across these systems is the absence of user-centric interfaces and integration with hyper-local community data, which affects usability and local engagement.

Moreover, many existing solutions either target large-scale institutional donors or operate at a non-digital grassroots level. There is a gap in platforms that enable **individual households**, **local food businesses**, and **community kitchens** to participate easily in food donation processes through a centralized digital system.

In light of these gaps, the **ServePlus** platform is designed to bridge the divide between surplus food providers and needy recipients using a smart, accessible web application. It leverages user roles (donors, volunteers, NGOs), location-based matching, and real-time updates to create a more organized and transparent food donation ecosystem. This approach not only supports sustainable food management but also encourages community-driven social responsibility.

III. METHODOLOGY

The ServePlus platform is developed as a web-based application using the Django framework in Python. The system is structured around three key user roles: Donors, NGOs/Volunteers, and Recipients (Needy Individuals or Institutions**)**. The platform aims to streamline food donation by facilitating real-time communication, request handling, and location-based delivery management.

A. System Architecture

ServePlus follows a **Model-View-Template (MVT)** architecture native to Django. The backend manages authentication, data storage, and API logic, while the frontend handles user interaction using HTML, CSS, Bootstrap, and JavaScript. The data is stored in a relational **SQLite database**, optimized for small to medium deployments.

B. User Workflow

- Donor: Registers, Login, add food donation details including quantity, location, and expiry time.
- Receiver: Views available donations based on location and sends request for specific food items.
- Admin: Manages user activity, monitors food transactions, and verifies legitimacy of users.

C. Core Features

- Real-Time Matching: Donation requests are matched with nearby NGOs or recipients based on geolocation and urgency.
- Dashboard & Notification: Each user type has a personalized dashboard with request tracking, history, and system notification.
- Data Security: The platform includes email verification, password hashing, and access control for secure interaction.
- Scalability: The modular Django structure allows for easy scalability and integration of features like SMS alert, AI-based food

quality predictions, and multi-language support.

D. *Modules:*

TABLE I
Modules

Module	Functionality
Authentication	Handles user registration, login/logout, and role-based access.
Food Management	Donors can add, edit, or delete their food donations.
Matching System	Matches available food with nearby receivers based on location and availability.
Request Handling	Receivers can send requests, and donors can accept or decline.
Admin Dashboard	Provides control over all data including user monitoring and system analytics.

E. *Tools and Technologies:*

TABLE II
Tools & Technologies

Component	Technology Used
Framework	Django (Python)
Frontend	ReactJS
Database	SQLite, PostgreSQL
Hosting	AWS EC2 (Ubuntu)
APIs	Google Maps API (For location tagging)

F. *Dataflow Diagram (DFD):*

The DFD illustrates the high-level interaction between the ServePlus system and its external entities: Donor, Receiver, and Admin. The diagram shows how each user role exchange data with the system. Donors provide food donation details, Receivers send food requests, and Admin monitor and approve activities. This diagram provides an overview of the entire system's scope and its primary data flows.

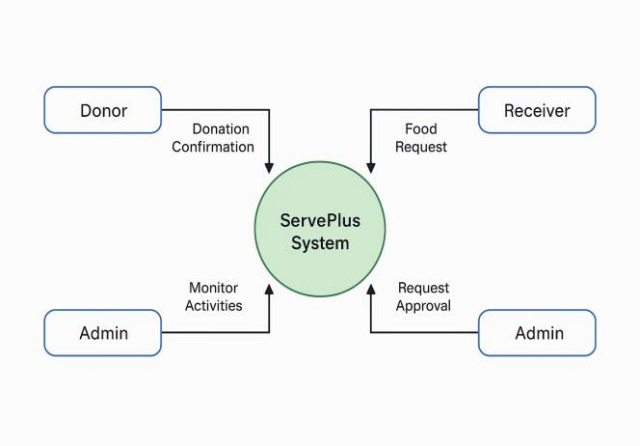

Fig. Data Flow Diagram (DFD) of the ServePlus System

IV. RESULT AND DISCUSSION

The ServePlus platform was tested in a controlled environment with simulated donor and receiver accounts. The system successfully facilitated the process of food donations from entry of request and confirmation. Donors were able to log in, add donation details such as quantity, expiry date, and pickup location, while receivers could view real-time listing and send requests for available food.

The matching and request handling functionality operated as intended, enabling seamless interaction between users. Admin users could monitor all activity, verify donations, and take corrective actions when necessary. The platform's web-based interface was found to be responsive and worked well across both the mobile and desktop browsers.

Key benefits observed during testing include:

- **Ease of Use**: Intuitive interface for both donors and receivers.
- **Real-Time Updates**: Instant visibility of newly listed donations.
- **Transparency**: Admin-level monitoring to avoid misuse.
- **Impact Potential**: The system demonstrate strong potential for reducing food waste and aiding communities in need.

V. CONCLUSION

ServePlus is a meaningful step toward solving the common yet serious problem of food wastage. Every day, large amounts of edible food are thrown away while many people go hungry. ServePlus bridges this gap by providing a digital platform where individuals or organizations can donate excess food and others in need can receive it. The system ensures that the donation process is smooth, organized, and transparent.

By using technologies like Django, HTML, CSS, Bootstrap, and ReactJS, ServePlus creates an easy-to-use web platform that works well across different devices. It allows donors to share food details quickly, and receivers to find and request food based on their availability and location. The inclusion of an admin role helps manage and monitors all activities to maintain the reliability and safety of the platform.

During testing ServePlus proved to be useful and efficient. The feedback received showed that users appreciated the clean interface and real-time updates. The platform encourages a responsible way of handling extra food and creates awareness about hunger issues in local communities.

In conclusion, ServePlus is not just a technical project but a socially impactful initiative. It has the potential to grow and serve more people by reducing food waste, prompt sharing, and supporting those who are in need. With further development and public involvement, ServePlus can become a strong tool for creating a more sustainable and caring society.

VI. FUTURE SCOPE

Although ServePlus works well in its current form, there are several ways it can be improved in the future. One of the most useful additions would be a mobile application for Android and iOS. This would allow users to donate or request food directly from their smartphones, making the process faster and more convenient.

Another improvement could be adding a location-based matching system using Google Maps or GPS. This would help receivers find donations that are physically close to them, reducing travel time and ensuring that food is picked up before it spoils.

We also plan to add features like notifications and alerts, so donors and receivers can get real-time updates on donation status. Adding multiple language support would help many users to understand and use the platform, especially in rural or regional areas.

We may also integrate AI tools in the future to predict demand and suggest efficient donation strategies. All these enhancements will make ServePlus more powerful, user-friendly, and impactful.

VII. ACKNOWLEDGMENT

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