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# Cloud-Driven Approaches for Smart Food management to Reduce Food Loss

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## ABSTRACT

Food wastage remains a critical issue worldwide, contributing to environmental concerns andexacerbating hunger among vulnerable populations. This project proposes a comprehensiveFood Wastage Management System aimed at mitigating food waste by connecting hotels,individual users, orphanages, and delivery personnel through an integrated web-basedplatform. The system enables hotels and users to efficiently upload details of surplus food along with real-time location data, ensuring that excess food can be effectively monitored andmanaged. Orphanages, which often struggle with limited resources, can access the platform to view available food donations in their vicinity and request the items they need. An administrative interface facilitates the oversight of food requests, the appointment of deliverypersonnel, and the management of all user roles, including hotels, users, orphanages, and delivery agents. By automating the processes of food donation, request management, and delivery coordination, the system aims to significantly reduce food wastage while providingtimely support to orphanages in need. The proposed solution not only enhances the efficiency of food distribution but also fosters a more responsible approach to managing surplus food.This project demonstrates the potential for technology to address social and environmentalissues, offering a practical framework for reducing waste and supporting communities.

## I. INTRODUCTION

The primary objective of this project is to develop a web-based Food Wastage ManagementSystem that facilitates the donation of surplus food from hotels and users to orphanages. Thesystem aims to provide a seamless platform where hotels and individual users can uploaddetails of extra food along with real-time location data. Orphanages will be able to viewavailable food donations based on their location and request the items they need. An administrative interface will be designed to manage food requests, appoint delivery personnel, and oversee the overall operation of the system. The project seeks to enhance the efficiency of food distribution by automating the processes of tracking donations, managing requests, and coordinating deliveries. By reducing food wastage and improving access to resources for orphanages, the system will foster better communication and coordination among all participants. Additionally, the project aims to ensure real-time tracking of food donations and deliveries, providing a user-friendly experience for all parties involved. Future enhancements will explore expanding system capabilities and integrating advanced food management technologies.

## II. RELATED WORK

The issue of food waste and its management has prompted the development of various systems aimed at improving food donation and distribution. One notable approach is a distributed framework for food donation and waste reduction, which leverages GPS data for efficient coordination between restaurants and local food banks. This system facilitates the timely donation of surplus food by ensuring that food is redirected to those in need in a more systematic and location-aware manner. This approach aligns with the proposed Food Wastage Management System, which similarly uses location-based data to connect donors with recipients, enhancing the efficiency of food redistribution while reducing waste.Another significant development is the use of cloud-based platforms for food donation systems, where real-time monitoring and GPS tracking play a crucial role in reducing food wastage. This system ensures that food donations are efficiently routed to recipients, particularly in large-scale food services. The application of cloud computing in food management, as highlighted in these studies, resonates closely with the proposed system, which utilizes cloud technology for real-time tracking, food request management, and coordination of deliveries. Additionally, blockchain technology has been explored in some studies, such as the Blockchain-Based Food Donation Systems, to ensure transparency and efficiency in food donation networks. Although blockchain isn't a direct component of the proposed system, integrating it could further enhance security and traceability, ensuring that food donations are effectively tracked from donor to recipient

## III METHODOLOGY

The methodology for the Food Wastage Management System is structured to facilitate efficient food redistribution through a well-organized system design and a robust technology stack. The system is divided into three primary modules: Donor, Recipient, and Administrative. The Donor Module allows hotels and users to upload surplus food information along with real-time location data, while the Recipient Module enables orphanages to view available food and request items based on proximity. The Administrative Module provides oversight for managing food requests, assigning delivery personnel, and monitoring all platform activities. The backend is built using Java, with a MySQL database storing critical data such as user profiles, food logs, and delivery assignments. Geolocation services are integrated to track the location of food donations and ensure efficient distribution.

The system architecture follows a three-tier model: the Presentation Layer (Frontend) provides the user interface, the Business Logic Layer (Backend) handles core functionalities, and the Data Layer (Database) ensures efficient data storage and retrieval. This architecture will be hosted on a cloud platform to ensure scalability and availability, allowing for real-time tracking of food donations and deliveries. The core algorithm focuses on matching donors with recipients based on proximity, available food, and delivery needs, with automated notifications for both donors and recipients. Additionally, the Delivery Coordination Module ensures timely distribution by assigning delivery personnel according to proximity and availability, optimizing the logistics of food redistribution and minimizing delays in reaching recipients.

## IV CONCLUSION AND FUTURE WORK

The Food Wastage Management System presents a robust solution to the pressing issue of food wastage by creating an efficient platform for surplus food redistribution. By integrating real-time tracking and automated management processes, the system enhances the effectiveness of food donations, ensures timely delivery to orphanages, and reduces overall food waste. The user-friendly interface and centralized administrative controls streamline operations and facilitate better communication among donors, recipients, and delivery personnel. This project not only addresses the inefficiencies of existing food management systems but also provides a scalable framework for future enhancements. The successful implementation of this system has the potential to make a significant impact on reducing food wastage while supporting vulnerable communities. Future developments may further refine and expand the system's capabilities, fostering even greater efficiency and outreach

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