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# WASTE FOOD MANAGEMENT SYSTEM

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## ABSTRACT

An advanced logistics system is a crucial sector of smart transportation systems. Developing effective technologies and strategies to enhance its performance in fulfilling customer needs poses a significant challenge, closely tied to individuals' quality of life. Its high effectiveness can minimize food waste, enhance food quality and safety, and strengthen the competitiveness of food enterprises. This study explores new integrated planning for intelligent food logistics systems. A key objective in our contemporary world is to eradicate food waste by repurposing available food resources within local communities: surplus food items in restaurants, stores, and food distribution centers nearing their expiration; and any perishable goods not fully utilized within their intended timeframe. This is especially important during emergencies like the COVID-19 pandemic. This study aims to develop an engaging mobile application (app) that offers a widespread platform where users can see available food resources in their vicinity and thus gain access to food, addressing two major issues: hunger and food waste.

**Keywords:** Sustainable Development Goals, Social Entrepreneurship, Food Waste, Hunger Rate.

## I. INTRODUCTION

A significant objective in our society today is to eradicate food loss by repurposing available food resources found within local communities: surplus food items in eateries, retail outlets, and food distribution hubs that may be nearing expiration; as well as any perishable goods not fully utilized within their intended timeframe. This is particularly crucial during emergencies such as the COVID-19 pandemic. This paper centers on developing an engaging mobile application (app) named Seva that offers a comprehensive platform where users can view available food resources in their vicinity and thus gain access to food, addressing two major challenges: malnutrition and food loss. This app is relevant to the UN sustainability objectives and aligns with the broader context of AI for Smart Living in Smart Cities. In addition to incorporating IoT (Internet of Things) and pervasive computing, this work positively influences both healthcare and the environment by alleviating hunger and minimizing food waste, respectively. We detail our SeVa app development using principles from AI, particularly HCI (Human-Computer Interaction), along with its assessment through user surveys. We also identify several open issues that present opportunities for future exploration.

## II. LITERATURE SURVEY

| Author/Year of publication | Title | Strength | Weakness |
|---|---|---|---|
| Shinta Okaviana R,Dinna Ambar wati Febriani, Intan Yoshana | FoodX,a system to reduce food Waste | The method of directing food to benefactors and the community remains largely manual, as the community reaches out to the donors individually, making it regarded as less efficient. | Social entrepreneurs are not to get profit but to implement an increase in the welfare of society at large, the financial benefits obtained are considered as a means or tool to complete social missions |
| Ayesha Anzer,Hadeel A. TAbaza, Wedad Ahmed, Hassan Hajjdiab | A Food Wastage Reduction Mobile Application | We decided to create our application to link the restaurant with the unfortunate people, so instead of throwing the food, the unfortunate will be able to pick it up from the | There are various applications, which are developed to control the huge waste of food, and it provides the opportunity to send that extra food to the people who need it. |

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|---|---|---|---|
| Gaytri N, Divagaran A R, | IoT-based smart Waste management system | If food wastage is monitored individually and providing them with rewards, there is a high chance of reducing the amount of food wastage in those public areas | Food wastage not only affects the environment but also creates a negative impact on the economy of a notion and creates great demand for food products |
| Hsiu-Hua Chang | Sustainable development: Drivers of consumer food wasting | This study attempts to construct an ethical decision-making model of the predisposing influence factors of consumers' food waste behaviors for providing academic and practical suggestions. | Food waste increases the use of energy, food, water, and land as well as greenhouse gas emissionand environmental damage. |

**A SYSTEM TO MINIMIZE FOOD WASTE**

In the study, JShinta Oktaviana R, Diana Ambarwati Febriani, Intan Yoshana, and LR. Payanta proposed a strategy. Food waste is a significant issue present in many nations. Indonesia is a country that generates food waste, ranking second after Saudi Arabia. Currently, several communities are concerned about the challenges of food waste and hunger in Indonesia. The community gathers surplus food from qualified donors and distributes it to those in need, aiming to alleviate the issues of food waste and hunger in Indonesia.

However, the method of channeling food from donors to the community remains predominantly manual, with the community contacting donors individually, rendering it less efficient. This research seeks to develop a system that connects the community with individuals or organizations willing to donate excess food. To enable users to provide quicker feedback, this system was created using a prototype methodology. In the final phase of development, testing was conducted with several volunteers and three communities to assess the completeness of the system's features. The FoodX system is designed to meet the needs of two types of food communities (with And without volunteers).

**B FOOD WASTE REDUCTION MOBILE APPLICATION**

In the paper by Ayesha Anzer, Hadeel A. Tabaza, and Wedad Ahed, Hassan Hajjdiab proposed that food waste is a prevalent issue in our society. Managing food waste is essential as it can enhance our environmental and economic sustainability.

We have recognized the potential of mobile technology to improve food waste management and developed an Android mobile application that allows restaurants to donate and share their surplus food and leftovers with those in need. This app enables users to register, log in, view items, add items to the cart, remove items from the cart, and log out. This app utilizes Firebase storage and a real-time database, allowing any user in need to view all the food images donated by various users and add them to their cart.

**C IOT-BASED SMART FOOD WASTE MANAGEMENT SYSTEM**

In the context of waste detection, nowadays, food waste is prevalent among students in colleges, hostels, and workplaces. This leads to increased demand for food products in the future, potentially resulting in food scarcity for upcoming generations. As managing food waste is a labor-intensive process, this paper primarily focuses on measuring food waste and providing rewards for users, displaying real-time food wastage for each individual on a screen and website for future reference. This research mainly aims to monitor everyone's food waste. Our model proposes creating a parallel result to provide a detailed report to both management and users regarding their excess food each time.

This assists in analyzing and generating a list of users who meet non-food wasting criteria and rewarding them for their commendable actions. We can achieve this either manually or by automating the process using the Internet of Things as a key tool. We employ an RFID sensor to track individuals' waste, which can only be accessed with an RFID card provided by management. We are automating the identification of food waste quantities in areas, confident that analyzing individual food waste can help decrease overall waste, rewarding users with prizes based on reports generated by the system.

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**D FOOD WASTE REDUCTION MOBILE APPLICATION**

Food is the third most crucial aspect of everyone's lives. However, the global food loss and waste have escalated to an amount ranging from one-third to one-half of all food produced. The causes can be attributed to inadequate planning, purchasing and preparing excessive food, and overproduction in restaurants. As a solution, the project team has developed a mobile application capable of capturing an image of food, identifying it, and measuring its weight. With the collected data, the implemented system features an intelligent agent that offers suggestions for recipes using leftover food, along with several additional functions such as guiding users in preparing various dishes through an interactive chatbot.

Furthermore, users are directed toward healthy meal options by considering previous meal plans and statistical report analyses. As a result, the recipe generation algorithm based on sentiment analysis has achieved 76 percent accuracy, and the team has developed a more precise technique for weight estimation compared to currently available calibration methods.

## III. SUMMARY

These applications have transformed the use of artificial intelligence by providing food to those in need. They are regarded as one of the best applications of software development. However, food waste remains a persistent issue.

According to individuals must be more mindful while preparing or ordering food, as many people worldwide go without meals. The reduction of food waste has significantly improved due to this application, but people need to be more aware and cautious to create a better world where no food is wasted.

## IV. CONCLUSION

The intricate reasons behind why nearly one-third of all food produced for human consumption is discarded are apparent throughout the food supply chain, from production to consumption. While numerous practical approaches have been proposed to minimize food loss and waste (such as enhancing storage facilities and launching food waste awareness campaigns), these do not address the root causes of why loss and waste persist to such a significant degree in today's world.

The primary obstacle to eradicating food loss and waste is the corporate dominance of the global food system. In this globalized, neoliberal political economy, waste generates profit and power; whether through corporations promoting unnecessary and unhealthy overconsumption via marketing efforts or through the governments of developed nations fostering overproduction of food commodities to serve as a means of control through food aid, the global food system depends on creating and profiting from waste.

Therefore, to genuinely put an end to food waste, citizens around the world must unite to reshape and reconstruct local and global food systems in a manner that promotes food sovereignty, honors nature, fosters the health and wellbeing of people, and guarantees the right to food for everyone in a sustainable and resilient way.

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