
AUTOMATING LEFTOVER FOOD MANAGEMENT USING A REAL-TIME WEB APPLICATION

Prof. P.G. Nemade*¹, Jay R. Chandak*², Yashshree K. Dhole*³

*¹Assistant Professor At P R Pote College Of Engineering And Management Amravati, India.

*^{2,3}Student At P R Pote College Of Engineering And Management, Amravati, India.

ABSTRACT

India generates 67 million tons of food waste annually, costing over \$14 billion. High-end restaurants often over-prepare food, leading to excess waste. Proposed solutions include repurposing leftovers, donations to charities, and stricter regulations. Research in Mumbai's restaurant industry found inefficiencies and opportunities for waste reduction strategies to emphasize the sector's economic importance and the need for comprehensive food waste studies. A real-time web application is proposed for managing leftover food by connecting restaurants with NGOs. This aims to reduce waste, alleviate hunger, streamline donations, engage charities, and ensure food safety.

Keywords: Food Waste, Food Management, Real-Time Application, Restaurants, Ngos.

I. INTRODUCTION

Food waste has major environmental, economic, social and ethical implications. Annually, 67 million tons of food worth \$14 billion is wasted in India. Restaurant food waste is a significant contributor. Over-preparation of food leads to excess waste in high-end restaurants. Proposed solutions include repurposing leftovers, donations to NGOs, and stricter waste regulations.

Research conducted in Mumbai's restaurant industry found systemic inefficiencies and opportunities for waste reduction strategies. There is limited research on restaurant food waste across India. The research emphasized the restaurant industry's importance to India's economy and the need for comprehensive food waste studies and solutions tailored to the Indian context.

This paper proposes "Feeding Hope", a real-time web application for managing leftover food by connecting restaurants to NGOs. The key objectives are to reduce food waste, alleviate hunger, streamline the donation process, engage NGOs and charities, and ensure food safety and hygiene.

II. LITERATURE REVIEW

[1] Development of leftover food management using efficient search techniques:

Proposed a system for optimized distribution of leftover food from restaurants and households to combat hunger.

[2] Overview of sustainable food waste management approaches:

Reviewed techniques like composting, anaerobic digestion, incineration and recycling that convert waste into energy, animal feed, nutrients and valuable products.

[3] Food waste management in India:

Discussed the magnitude of India's food waste problem and examined systemic gaps, underlying societal attitudes, regulations and infrastructure challenges.

[4] Food waste management in hotels and restaurants:

Highlighted mishandling practices in hotels and restaurants causing food contamination and wastage. Proposed solutions include process standardization, staff training, and public awareness campaigns.

[5] Online food donation system for orphanages:

Proposed minimizing food wastage by allowing leftovers to be donated to orphanages, with system coordinating food pickup and delivery.

III. PROBLEM STATEMENT

Annually, India wastes 67 million tons of food worth over \$14 billion. Restaurant food waste significantly contributes to this but lacks comprehensive studies and solutions tailored to India. A system is needed to connect restaurants with NGOs to repurpose leftover food, alleviate hunger and reduce waste.

IV. METHODOLOGY

"Feeding Hope" provides a platform for restaurants to list surplus food available for donation daily. NGOs can claim this food on a first-come basis for redistribution to the needy. Users can donate money to fund meals. The application tracks listings, donations and orders in real-time. Key modules include volunteer, NGO and restaurant portals for listings, claims and tracking, donation gateway, and live dashboard displaying metrics.

V. DIAGRAM

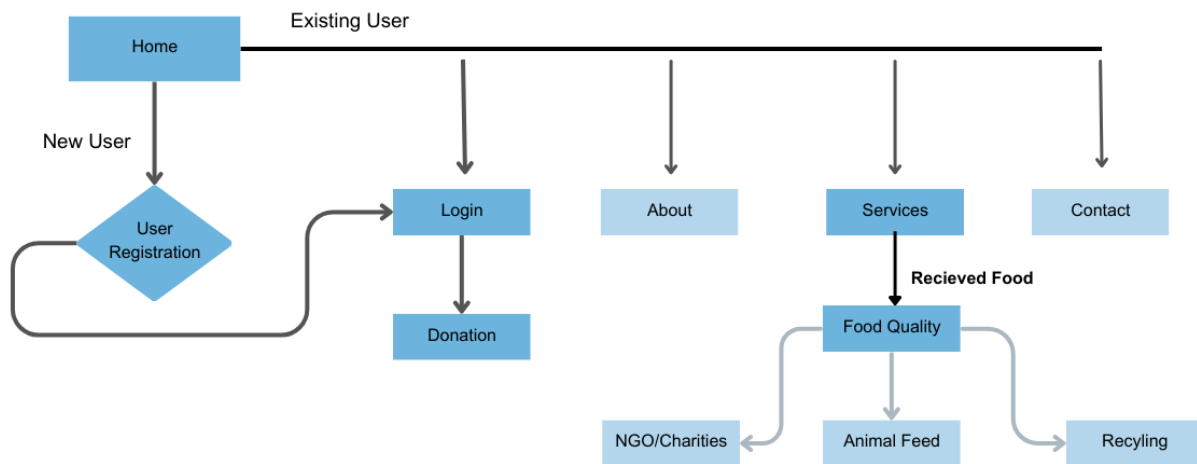


Figure 1: Use case diagram

VI. LIMITATIONS

One of the key limitations of the system is its reliance on internet access. Both restaurants and NGOs would need an internet connection to access the web application, list available surplus food, receive notifications, and track orders. In areas with poor internet connectivity or access, the system's functionality could be hindered, potentially limiting its reach and effectiveness.

Another limitation is the willingness of restaurants and NGOs to adopt and actively use the platform. While the application aims to streamline the process of connecting surplus food with those in need, its success relies on the voluntary participation of restaurants to consistently list their leftover food and NGOs to promptly claim and collect the donations. User adoption and sustained engagement could pose a challenge, especially in the initial stages of implementation.

VII. PROJECT FLOW

1. Restaurants log in and list available surplus food with quantity, pickup timing/location and expiry
2. Portal algorithm matches and notifies nearby NGOs of food availability
3. NGO claims the food listing before expiry
4. Restaurant confirms order and keeps the food separate for pickup
5. NGO picks up food for redistribution to needy beneficiaries
6. Metrics like total listings, claims, food donated get updated real-time

VIII. RESULTS AND DISCUSSION

The web application was developed using HTML, CSS, JavaScript and python(flask). Key results:

1. Intuitive responsive UI/UX for restaurants and NGOs
2. Secure authentication and real-time database
3. Daily food listings by restaurants with automated NGO notifications

4. Order tracking from listing to claim to confirmation

5. Live metrics dashboard showing total food donated, NGOs engaged etc.

The solution streamlines connecting restaurants with NGOs to minimize wastage. Limitations are reliance on internet access and user willingness. Further enhancements like integrated meal funding and mobile apps can expand reach.

IX. CONCLUSION

The real-time application facilitates restaurant food waste management by linking surplus food with NGOs. Benefits include reduced wastage, eased donations and hunger alleviation. This sustainable solution can extend to institutional cafeterias and caterers to combat food waste across India's food services sector.

X. REFERENCES

- [1] Ministry of Food Processing Industries Report Brown, L., Dominguez, I., Sanguinetti, A., & Lee, H. (2020). Food redistribution through digital platforms in Australia. Resources, Conservation and Recycling, 161, 104956.
- [2] Mumbai Restaurant Sector Research Food Waste Management in Hotels & Restaurants: <https://togocomposter.com/food-waste-management-in-hotels-restaurants/>
- [3] ReFED Report ReFED. (2016). A roadmap to reduce US food waste by 20 percent. Rethink Food Waste: Through Economics and Data (ReFED) Report.
- [4] Indian Journal of Community Health Ganglbauer, E., Fitzpatrick, G., & Comber, R. (2013). Negotiating food waste: Using a practice lens to inform design. ACM Transactions on Computer-Human Interaction (TOCHI), 20(2), 1-25.
- [5] IEEE Conference Paper Development of Leftover food management system using efficient hunger search techniques: <https://ieeexplore.ieee.org/document/9641624>
- [6] Avristech Article Food Waste Management in India: <https://www.avristech.com/food-waste-management-in-india/>
- [7] Researchgate Paper Reduction of Food Waste: REDUCTION-OF-FOOD-WASTAGE-THROUGH-DONATION-USING-ONLINE-FOOD-MANAGEMENT-SYSTEM FOR-ORPHANAGE.pdf (researchgate.net)