AI-Driven Food Contribution and Management System: Enhancing Efficiency and Reducing Waste

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Abstract. Food waste phenomenon is massively racing across the world, 1/3rd of food produced for human consumption wastes in competition with our Food and Agriculture Organization. This staggering total accounts for approximately 1.3 billion tons of food wasted per year. Meanwhile, the World Health Organization says 20% of the global population is experiencing extreme deprivation of food. These numbers highlight the desperate source of solutions to both solve the hunger problem and the wastelands. The Food Waste Management System intends to do the same by collecting the surplus food from NGO, donors, marriage halls, and hotels and redistributing them to the needy people to reduce waste and fight hunger and malnutrition in the society.

Keywords: Donor, Food wastage, NGO: Non-Government Official.

1 Introduction

Food wastage is a major issue, this system addresses this problem by collecting the surplus or food left out from marriage halls, hotels and donating the food to needy people. The initiative focuses on helping poor communities fight starvation and malnutrition through a systematic process of reaching out to people in need of food, thereby ensuring surplus food doesn't go to waste. The system consists of a web-based application where the admin can show food details in the home page where user can check where know the food availability and details of the food they offer for donation. So, whenever a user submits a request for food, the admin team will get in touch with a donor to pick-up the food and distribute it.[1] This process not only helps reduce food waste but also fosters a sense of community by connecting donors with those in need, ultimately contributing to a more sustainable and equitable food system. [1] In countries with high population densities like India, food wastage has become a significant concern. A substantial amount of food is discarded in garbage bins, on streets, and in landfills, highlighting the severity of the issue. Events such as marriages, canteens, restaurants, and various social gatherings often result in excessive food being left uneaten.

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This wastage not only contributes to environmental pollution but also reflects deeper economic problems, as it signifies a lack of efficient food distribution and management.[2] it can be effectively utilized by donating it to organizations that serve vulnerable populations, such as orphanages, old age homes, and NGOs. By implementing a structured food donation system, we can ensure that excess food is redirected to those in need, thereby addressing both hunger and waste.[2]

OBJECTIVE

This project focuses on saving food that would otherwise be wasted by redirecting it to people who want it. The said project will form a mechanism of donating food to needy people from donors like restaurants, caterers, and event organizers. Beyond fighting against such a waste issue, this actions help us to get food for the most slice of our society which lay vulnerable in a lot of ways, typifying in fact, hunger.

By coordinating and managing this process, food helps those who are food insecure by turning potential waste into a resource through the Food Donation Project System. Not only the recipients of the donations are benefited but it spreads a culture of generosity.

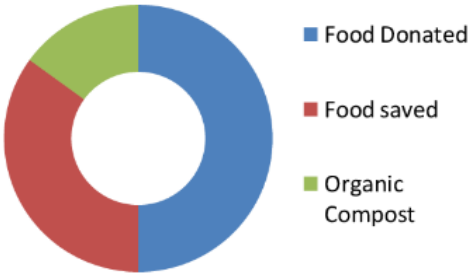

Fig. 1. Food Donation

2 LITERATURE SURVEY

Đeni Lovrencic ,Nenad Vretenar Zoran Jezic (2017) “The Challenges of Establishing Food Donation System, International Scientific Conference on IT, Tourism, Economics, Management and Agriculture , Budapest, Hungary,The paper “The Challenges of Establishing Food Donation System [3], and published on 2017 talks about filling the gap in community food security, with food donation organizations that have these responsibilities; collection from businesses and members of the community, storage of

food, distribution to the food banks, and later get passed on to community members suffering from particular goods. The purpose of this paper is to solve some organizational problems that was blocking the establishment of efficient organizational relationships for a sustainable system of food donations.

R. Adline Freeda, M.S.Sahlin Ahamed (2018), "Mobile Application for Excess Food Donation and Analysis" International Journal of Innovative Research in Science, Engineering and Technology, The paper 'Mobile Application for Excess Food Donation and Analysis' [4], published in 2018, describes that every day 1.3 billion tons of food is wasted and one third consumed are remnant. This application provides information on the amount of food waste and the impact is visualized by using data analysis. They notice the hungry people and minimize food wastage at once. They send alerts to nearby NGOs, Orphanages, and Volunteers to collect the food.

Mohanapriya M1, Navin Prasath S2, Russell Wicliff R3,Sanjith Raam RB4, Mahesh kumar R "Givlo Food Donation" [5] These systems enable food donors and recipients to get in touch, a step in the right direction to fight food waste. Web-based platforms also act as collaboration portals between food businesses and charities, allowing direct communication and tracking of donations. However, given the current methodology of physical tracking, a void is present for optimized, technology driven queues to maximize end-to-end donations and reduce overall waste.

3 METHODOLOGY

A Web devices to Reduction of Food Wastage System is presented to recognize wastage of food. Admin collects food details from donors and shares it to nearby orphanages & poor people. The admin will send alert messages to the relevant donors after receiving the request for food requirements. It aids in solving the food wastage issue quite effectively. It also helps if the restaurant can monitor the amount of food it overproduces daily. The system also enables the benevolent donation of redundant food in frequent basis to those in need.

To access the Food Waste Management System, users must log in successfully. Upon logging in, they can utilize various features tailored to their roles. The system primarily accommodates three user roles: Admin, Donator, and Requester.

Use case Diagram

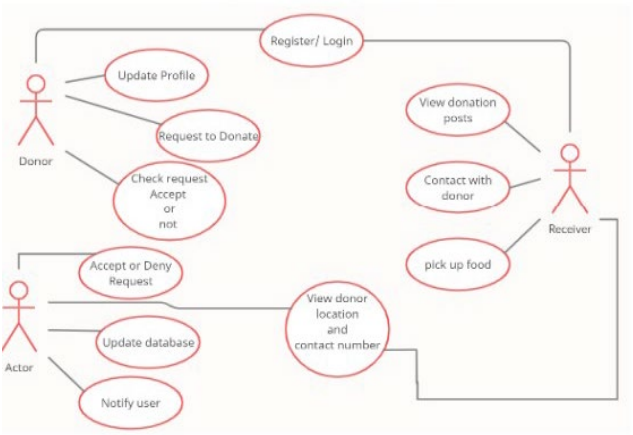

Fig. 2. Usecase diagram (donor, actor, receiver)

Workflow Diagram

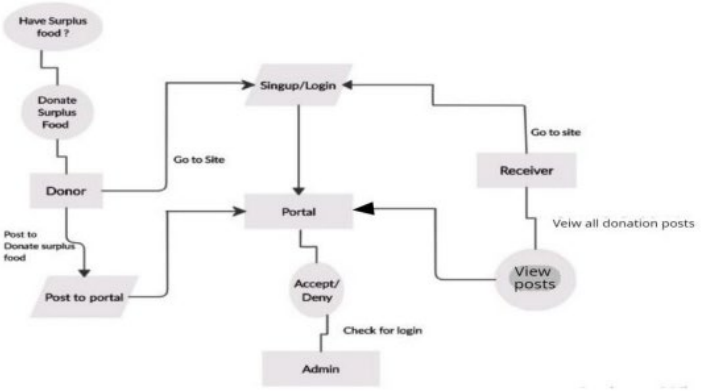

Fig. 3. Project Workflow Diagram

4 SYSTEM IMPLEMENTATION

The system comprises of three major modules:

- Admin
- Donor
- Receiver

Table 1. THE SYSTEM COMPRISES

Name of the Elements	Function
Admin	- Responsible for accepting or denying user's request - Notify the users - Monitor or update all types of information
Donor	- Send request to donate - Create post after login - Get notification from admin whether the post is published or not
Receiver	- Can view all posts from donors - Contact with donor - Collect and distribute the food items

Features of the project on Sign Language Recognition Using Python:.

- User Registration and Profile Management: Let users create accounts and administer their profiles and information including their preferences.
- Food Donation Submission: Allow the donors to indicate surplus food items that they are ready to donate in terms of type, quantity, and the expiry date.
- Real-time Tracking and Notifications: Allow for real time tracking of donated foods and inform donors and volunteers of the pick up time, exact location and status of the delivery.
- Feedback and Rating System: Create a mechanism where donors, volunteers and beneficiaries can leave a feedback on their experiences and make recommendations on their areas for enhance.

- Analytics and Reporting: Facilitate production of reports and analytics looking at the trends of donations, volunteer actions and impact variables for optimization and effectiveness evaluation.

5 FUNCTIONAL REQUIREMENT

The server-side requirements for the Food Waste Management System are crucial for ensuring a smooth and efficient operation. Here are the key requirements and features:

Database Structure:

. The database must include a user table to store user information effectively.

It should also have dedicated food tables for users, which is significant for managing food donations and tracking interactions between users and the system.

The database must be capable of communicating with the client-side application to ensure seamless data exchange and functionality

User Account Creation:

. All users of the software must have the ability to create an account that stores their data and ties their actions to a user alias. User registration and login are mandatory to ensure secure access to the system.

The system should provide an easy-to-use graphical user interface (GUI) for account creation, asking for an email address and password.

It must notify users if incorrect characters are used in the email or password fields, if their email has already been used, or if any required fields are left empty.

Additionally, the system should enforce strong password policies, explaining to users why a submitted password is considered weak or insecure

Manage Users: Admin can manage all Members and their records on one click. Here, manage means ADD, UPDATE, VIEW, and DELETE record.

Send Message: The system shall provide an interface for sending messages between users. Messages should be sent in real-time and have no delays.

6 NON FUNCTIONAL

Within the context of the Food Waste Management System, there are a number of non-functional requirements that are equally important in enhancing the satisfaction of the interface users and the effectiveness of the system. These requirements include security, reliability, availability, and maintainability.

Security: In all processes involved in food donation, security is a critical issue that needs to be ensured. This is because food donors have sensitive information such as their personal information and information relating to their donation that should be kept secure. Incorporating adequate security measures helps in protection of system and user confidence which is crucial in promoting and encouraging food donation activities.

Reliability: Given that the system will be used by many people, it must ensure the desired level of effectiveness throughout its use. This enables the system to reliably and accurately respond to the users' needs at any time when the users are either making a donation or getting assistance.

Maintainability: The system has a data maintenance enforcement in the form of a commercial database, which controls the site from an application server perspective. During a malfunction, the program will be entirely reinitialized to achieve restoration. Most importantly, the software is designed to allow modules to be updated and or repaired without too much disruption to the service process.

Availability: It is important that the system be available anytime, and users should be able to use any compatible web browser to access it. This means that the system should only be limited by the availability of the server.

7 CONCLUSION

In conclusion, the waste food management and donation system is a get solution to become the problem of food wastage and also help the community in need. This system would enable donors, administrators, delivery personnel, and NGOs to work together towards the collection, distribution, and utilization of the donations effectively. Indeed the waste food management and donation system is a prime example of the capabilities of technology to create social good and tackle humanitarian issues. Talk to every stakeholder and let them feel their ownership towards climate chances. Related: Through and through used as a Roman proverb: 'If I only knew.' By leveraging the power of

people, organizations, and technology together, we can build a better, more sustainable and equitable future for everyone.

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