

Bhojan Setu

A Web Application for Food Donation and Collection Management

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Abstract- Food waste is a serious global problem that has significant environmental, economical, and social consequences. Many measures to decrease food waste have been proposed in recent years, including the creation of leftover food management systems. This study presents a web application-based leftover food management system with three modules: donors, non-governmental organizations, and volunteers. The system intends to bridge the gap between food waste and hunger by offering a platform for donors to give their leftover food to non-profit organizations, who may then distribute it to the needy through their volunteer network. This article presents an overview of the proposed system, including its functions and advantages. It also covers the system's challenges and limits, as well as future research directions to increase the system's performance.

Keywords — food management, waste food, hunger, leftover food, food donor, volunteers

I. Introduction

Food insecurity hits millions of individuals globally, even in areas where food production is high. As much as the issue of hunger exists, plenty of food goes to waste every year as a result of inefficient distribution. Charitable organizations and non-governmental organizations (NGOs) play a critical role in filling this gap by receiving excess food from donors and distributing it to those in need. But the absence of an organized process for managing food donations discourages the efficiency of such benevolent activities.

Bhojan Setu seeks to overcome these issues by offering an online platform that brings together administrators, NGOs, and donors to make the process of food donation and collection more streamlined. This platform mechanizes

important processes, monitors donations, and enhances coordination between users so that food is delivered to those who actually need it.

Current mechanisms of food donation and collection tend to be inefficient, non-transparent, and uncoordinated between administrators, NGOs, and donors. The absence of a shared platform leads to wastage of food, poor schedules for collections, and inconvenience in tracking and managing donations. Bhojan Setu endeavors to offer a convenient solution in the form of a platform through which donations are traceable in real time, volunteer management, and transparent reports.

II. Literature Review

Schneider [1], in 2012, provided insights into the distinctions and parallels among present organizations involved in distributing food to those in need, along with an exploration of the political, legal, social, and logistical obstacles and incentives associated with this subject. Food banks acquire donated food from both national and local sources, including The Emergency Food Assistance Program (TEFAP) and supermarkets.

In 2014, Davis et al. [2] designed transportation schedules that facilitated the collection of food donations from local sources by the food bank and the distribution of food to charitable agencies. While food plays a significant role in shaping people's identities, the swift increase in the prevalence of food banks and donation points in supermarkets and schools implies a normalization of food aid.

In 2016, Purdam et al. [3] investigated the discourse surrounding food aid and the stigmatization of individuals living in poverty, the extent of malnutrition, and the experiences of food bank users. They utilized survey data and case studies for their analysis. Non-profit hunger relief organizations aim to mitigate the adverse impacts of food

insecurity by offering food and services to individuals in need.

In 2016, Davis et al. [4] conducted a study that analyzed and predicted food donation behavior for a domestic hunger relief organization. Their comprehensive numerical investigation aimed to quantify the level of uncertainty associated with the donor, product, and supply chain structure.

In 2017, Lee et al. [5] explored how BPS (Buy-Donate-Sell) can alleviate food waste in a retail grocer setting and examined its interactions with other waste reduction mechanisms, such as waste disposal fees and tax credits for food donation. The findings indicate that under BPS, the threshold net tax benefit needed to encourage donation rises because BPS competes with donation for surplus primary units. Various policies related to food waste management, reduction, and donation are established to enable and incentivize individuals, organizations, and businesses to diminish their food waste.

In 2018, Chen et al. [6] concentrated on examining activities related to the prevention and diversion of food waste, utilizing data sourced from two U.S. waste reduction recognition programs, namely the U.S. Food Waste Challenge (FWC) and the EPA Food Recovery Challenge (FRC).

In 2020, Roe et al. [7] delved into various subjects within the food waste literature, highlighting ethical issues that, in their perspective, deserve additional contemplation. These encompass the focus on food donation as a strategy for minimizing food waste, the rise of markets for imperfect-looking food (i.e., "ugly food"), the suitability of guilt appeals for instigating reductions in wasted food, and the ethical dilemmas associated with selecting dates on food labels.

III. Existing System

Manual processes and limited technology support are characteristic of the existing food waste management and donation system. Conventional means of linking and coordinating food donations are phone calls, physical visits or word of mouth. The manual process results in inefficiencies, delays and lack of transparency. In restaurants and food operations, simple spreadsheets or manual tracking systems are employed for inventory management. Higher food wastage and financial losses are brought about by this manual method. Restaurant sales forecasting relies on past data and experience. This method may not provide accurate projections, leading to problems like overproduction of food or under preparation, both of which add to food wastage.

The current system is devoid of efficient communication, sophisticated analytical capabilities, and real time data insights required for impactful food waste management and donation. There is a need for a more technology-enabled and streamlined system that can maximize food stocks, enable the connections between donors and NGOs, and provide accurate sales forecasts to reduce food waste.

IV. Proposed system

To transcend the limitations of the current system, we recommend instituting an integrated food waste managing and donation system. The suggested Bhojan Setu App aims to create a convenient and efficient platform for the interaction of donors, administrators, and Ngo's to facilitate the process of food donation. The system has three principal features, each having a different function.

1. Donor Interface:

The Donor feature enables individuals, organizations, and businesses to register as food donors. Donors can simply post details about excess food stuffs they'd like to donate, such as type, quantity, and availability. They can book pickups, monitor the status of their donations, and get notifications when their donation is accepted or picked up by Ngo's. Donors will possess a user-friendly dashboard to manage their donations and view their contribution to the community.

2. Admin Panel:

The Admin feature gives system administrators the capabilities to manage and monitor the whole platform. Administrators can validate and approve donor and Ngo's registrations, track donation postings, and maintain the integrity of the system. They can also create reports, settle disputes, and keep the website running in general. The admin panel is an essential part to provide transparency and guarantee ethical food handling.

3. Ngo Dashboard:

Ngo's play a central role in linking donors and beneficiaries in an efficient manner. The Ngo's enable individuals or organizations to sign up who organize the pickup and distribution of donated food. Ngo can see available donations, accept and arrange pickups, and coordinate deliveries to food banks, shelters, and other beneficiaries. The Ngo dashboard also helps in route optimization and logistics management to reduce food waste and make deliveries on time. By integrating these prominent features, Bhojan Setu System App will establish an efficient and accountable system that makes food donors proud, helps the administrators keep the system in check, and allows Ngo's to effectively narrow the gap between excess food and needy people. This system will make the donation of food much easier, keep food waste minimized, and enhance the health and well-being of communities while maintaining a culture of generosity and corporate social responsibility.

V. Methodology

The methodology applied in crafting the food aid website focuses on establishing connections between food donors and registered Ngo, with the primary objective of reducing food wastage and streamlining the distribution process. The

website encompasses functionalities such as donor, Ngo and admin registration and login/logout procedures. It further incorporates capabilities for specifying food details, expiration dates, and quantities. The methodology is organized into distinct stages, including Needs Assessment and Planning, System Design, Development, Testing, and Deployment.

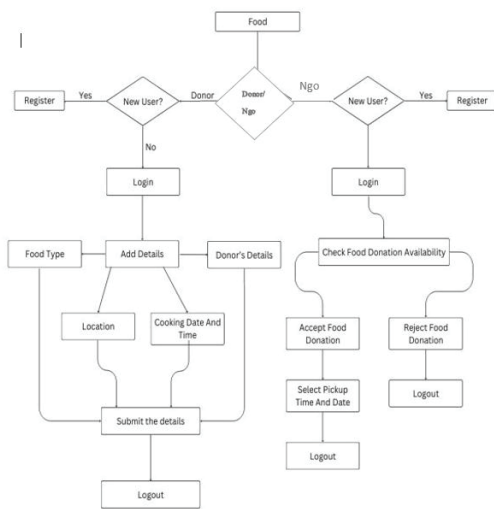


Figure 1. Flowchart Diagram

VI. Result

1. Login:

Bhojan Setu App login page is made in a way that it is secure, easy to use, and pleasing to look at. Having a simple clean design and explicit labels makes it simple for the user to spot and type their login credentials. The login page also employs a secure connection and strong password requirement in order to ensure users' accounts are secure against unauthorized use.

In addition, the login page has links to sign up for a new account and recover forgotten passwords, making it simple for new users to register on the website and for current users to recover access to their accounts. Generally, the food donation website's login page is an excellent user experience and helps with the overall security of the website.

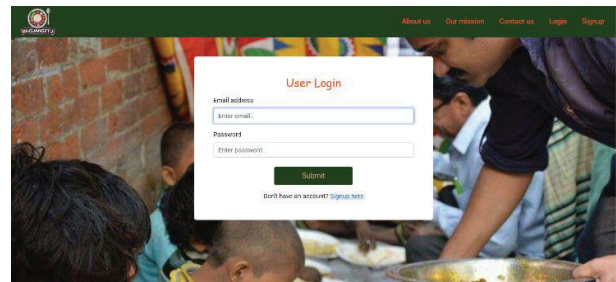


Figure 2. Login Page

2. Register:

The registration form for this research study gathered the following demographic data from participants: first name, last name, email address, and password. Participants were also asked to verify their password and to choose a user role (Donor, Ngo, or Admin). The registration form employed CAPTCHAs to avoid spam submissions.

The data gathered through the registration form was utilized to generate user accounts and to notify participants with essential details regarding the study, including updates on the study schedule and requests to complete surveys or interviews.

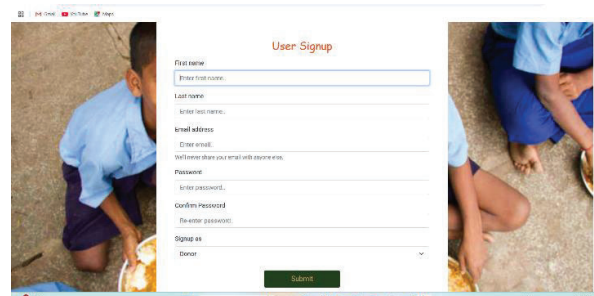


Figure 3. Registration Page

3. Admin Dashboard:

The dashboard of the food donation management system displays a range of information that relates to the food collection and donation process. It shows pending donations, prior donations, Ngo's, donors, new donation request, donations not collected, donations collected, and yet to be collected. This data can be utilized to effectively and efficiently manage the food donation process.

For instance, the dashboard can be utilized to determine donations that require allocation to Ngo's, donors who require follow-up, and new requests for donations that require processing. The dashboard also gives a snapshot of the general status of the food donation system, which can be beneficial in making decisions regarding resource allocation and process optimization.

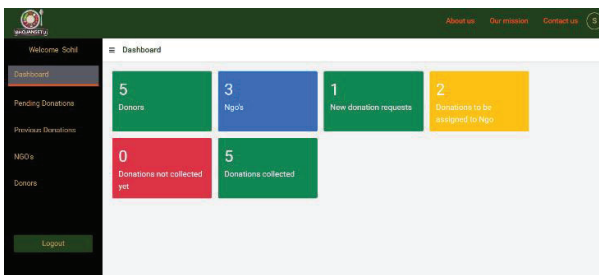


Figure 4. Admin Dashboard

4. Donor Dashboard:

Donor dashboard is a web-based program intended to serve donors an effective way of directing their charitable contributions. This centralized platform gives donors access to all of their entire giving history in order to easily view information including the date a donation was made, the size of the donation, and to which campaign or cause it gave. Moreover, the dashboard features a set of donation management tools that allow donors to make single and recurring donations, track the status of outstanding donations. In addition, the dashboard provides a profile details section in which donors are able to view and update their own details, such as their name, email address, and mailing address. The ease of use of the donor dashboard is advantageous to both donors and non-profit organizations because it enables donors to manage their donations effectively while promoting increased and more meaningful participation in philanthropy.

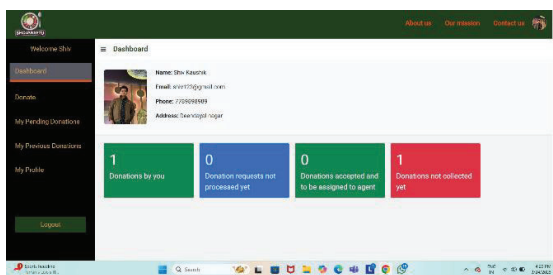


Figure 5. Doner Dashboard

5. Ngo Dashboard :

The Ngo dashboard is crucial to ensuring food collection and distribution goes smoothly. It assists Ngo's in a couple of significant ways. Ngo's first receive critical instructions from administrators on where to collect food from donor homes. This ensures everyone knows what they are supposed to do. Once they pick up the food, Ngo's can notify everybody that they have done so through the dashboard. It is saying, in a sense, "Mission

accomplished!" This serves to keep track of what has been picked up for everybody.

Ngo's can also look back on all of the food they've gathered in the past. It shows them how much they've gathered and when. It's sort of like a history of their work. Finally, Ngo's can edit their personal details via the dashboard. This is convenient for keeping their information up to date and ensuring everyone knows how to contact them.

Therefore, the Ngo dashboard is the command center for Ngo. It keeps everything in order and assists Ngo's in doing their work efficiently. This is advantageous to all parties participating in food donation programs.

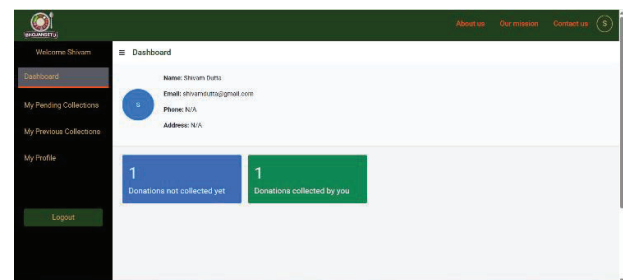


Figure 6. Ngo Dashboard

VI. CONCLUSION

The establishment of a Bhojan Setu App represents a pivotal step in addressing the issue of food insecurity within our society. By harnessing technology and uniting those in need with generous donors, we have the potential to profoundly impact the lives of individuals and families grappling with hunger. This research paper has delved into the advantages and obstacles associated with food donation websites, illustrating how they can streamline the donation process, boost efficiency, and reduce food wastage. Furthermore, they serve as a platform for individuals and organizations to collaborate and effect positive change in their communities.

Nevertheless, it is imperative to recognize that Bhojan Setu App, on their own, cannot offer a comprehensive solution to the multifaceted problem of food insecurity. They should be considered as one component of a more comprehensive strategy that encompasses policy reforms, educational initiatives, and community involvement. The pivotal element lies in collaborative efforts among government agencies, non-profit organizations, and businesses to establish a sustainable and all inclusive food system.

By lending our support and utilizing , we can contribute to a fairer society in which no one suffers from hunger. Let us persist in raising awareness, fostering empathy, and taking concrete steps to ensure that every individual has access to nourishing food. Together, we can generate a lasting impact and shape a brighter future for all.

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