

# Helping hands A System to reduce food waste

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## ABSTRACT

Wasting food has always been a common problem in the world, especially in the underdeveloped or developing countries where poverty lives above the line. Food waste reduction is crucial since it can bring betterment to our economic and environmental sustainability. We've realized the importance of technology in the reduction of food waste and developed a web-based gateway for restaurants, volunteers, caterers to directly get in touch with the local NGOs, Orphanages, Old Age Homes and donate the excess food. This website is using firebase storage and real time database.

**Keyword:** - Food Wastage; NGO; Web Based; Authentication; Storage

## 1. INTRODUCTION

India is a developing nation. Although its economy is growing, poverty is still a major challenge. It has around 84 million people living under extreme poverty which makes up ~6% of its total population as of May 2021. That means, around 84 million people fail to subdue the basic human necessities, one of them being hunger. While on one side, tons of food get wasted, for functions, weddings, restaurants, there are many who sleep empty stomach. Hence, to tackle the increasing food wastage and help the needy ones, we've come up with a system that will connect the welfare organizations, NGOs, donors, and common people from all around the world with each other.

Food Waste Reduction is an aim towards the end of hunger and no wasting of food to make a hungry free world. According to the survey conducted recently, 1.3 billion tons of food is thrown as waste every year. Also, one third of the food was claimed to be leftovers. The focus of our project is to reduce the amount of food wasted every year and use it for the needy people all around the world.

Therefore, a web-based system is being developed through which, restaurants, caterers, or volunteers can donate the food within their limit and at the same time it lets the organizations such as NGOs, Orphanages, Old Age homes to put forward their requirements, request for the donation, or get in touch with the giving side for better and quick communication. The basic pre-requisite to use this website is a stable internet connection and a supporting browser.

## 2. LITERATURE SURVEY

According to [5], food waste has always been a significant issue around the world. From a survey, it was predicted that more than 58 percent of food produced for daily consumption is wasted regularly. On the contrary, more than 60 percent of people in the third world countries are suffering from malnutrition. Hence, the emphasis on this issue is mandatory. According to [6], people in this modern age are more connected with the rest of the world through internet. There are various websites, which had been developed to control the mass wastage of food, and it provides the opportunity to donate that extra food to the people who need it. There are multiple mediums, which can control food waste. A few of them has been discussed below:

### 2.1 No Food Waste - Indian Food Wastage Reduction Application

No Food waste is an Indian application that allows the restaurants, food stalls and parties to inform about their excessive leftover foods to the needy people who can come and collect them. This application collects the leftover and distributes it among the homeless, slum dwellers and orphanages as well as nursing homes. According to [11], the users can also notify the donators by showing hunger points, and they will distribute the foods at the desired locations. The only requirement of the application is they accept the food only if it is prepared two hours prior.

### 2.2 Cheetah - Food wastage Reduction Application from Africa

Researchers from the University of Twente have developed this application to reduce the number of food wastage in the continent of Africa. It has come to their notice that various fruits and vegetables ends up spoiled and uneatable due to the poor road circumstances, less refrigeration in Africa. This application is developed to collect the food items before they get rotten and distribute it to the needy population of Africa. Dutch Ministry of Foreign Affairs have personally helped the researchers in the development of this project. As of now, farmers and food transporters use this application, and it has also helped them to reduce the chances of food bribing in Africa. It is assumed that the public version of this application will be released in May, next year [10].

### 3. FoodCloud - An application to control food waste by UK and Ireland

This application has been declared as one of the most useful food wastage techniques in the UK as well as Ireland. This application was built in a way it notifies the supermarkets, stores, about their surplus food so that the welfare organizations can collect them and reduce the chances of food wastage. This application works as a medium that provides the type of foods and arranges the pick-up for the charitable societies. It also has the feature to collect and store the food so that the organizations can collect the food as per there requirements. According to [9] above 1,200 business hubs and 3,000 charitable societies work under this application to provide surplus food to the homeless and needy.

These applications have changed the way we view AI by providing food to the needy people. It is, without a doubt, considered one of the best uses of software development. However, that doesn't change the fact that food wastage is still a bad habit. According to [12], people need to be more aware of the quantity in which they produce food because many people around the world still sleep without subduing their hunger. Food wastage reduction has decreased a lot due to the usage of these applications, but people need to be extremely careful so that a better world can be created where no food is wasted.

## 3. PROBLEM STATEMENT

The existing food wastage reduction systems have been implemented in different countries worldwide. Major success was seen in UK, Ireland and Indonesia. And while they only focused one module, that is connecting users with organizations, NGOs, or volunteers, ours will be focusing on three different domains where interactions among the community will be on higher level and the experience will be more user friendly.

## 4. PROPOSED SYSTEM

This system is comprised of three logins; the admin login, the user login and the organization login. If there is more than one user to claim the food, the system then does the job scheduling and the request is accepted to the user on a priority basis.

### 4.1 Modules

**Admin Login:** Admin can access the authorized modules by login to the system using his credentials.

- View Donator Details: Admin can view registered user details.
- View Receiver Details: Admin can view receiver side registration request, check the credibility and approve their login.
- View information: Admin can view all the information which is added into the database.
- View Feedback: Admin can view feedback of the user.

**Donator Login:** Donator must register with his details and system will provide him with id and password. He must use this user id and password to login to the system.

- Add Food Detail: User can add food details like quantity, type, pick-up location and expiration date.
- Add Products Details: User can also donate things, like stationery,
- clothes, toys, etc.
- Receive Mail: User will receive an automated mail about acceptance/delay of donation request.
- Donate Funds: User can also donate funds to the desied organization.

**Receiver Login:** Receiver can access the system using his credentials.

- Receiver Login: Receiver side can log in with their user ID and password after the registration process is approved.
- Accept Donation: Receiver can accept the pending requests and collect the food from the given location.
- Upload QR: Receiver side can upload their QR codes and receive payments directly in their bank accounts.

## 5. DESIGN

During this phase, An interface design for features that have been determined are carried out. The results of this will be used to develop prototype applications for the next phase. Bootstrap and CSS tools are used to design the user interface of the application. English and Hindi language are used as the interaction priority to make it easier to use in local communities. Fig 2 and Fig 3 are some examples we created for UI design.

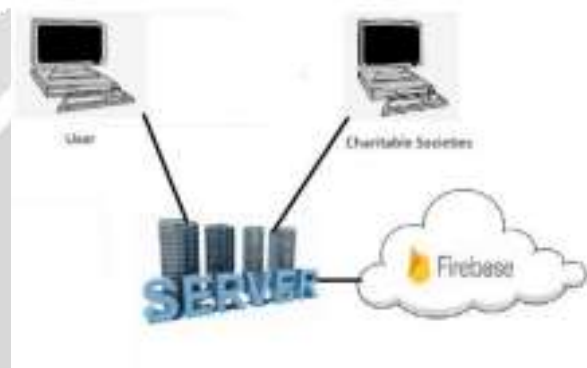


Fig 1. Design

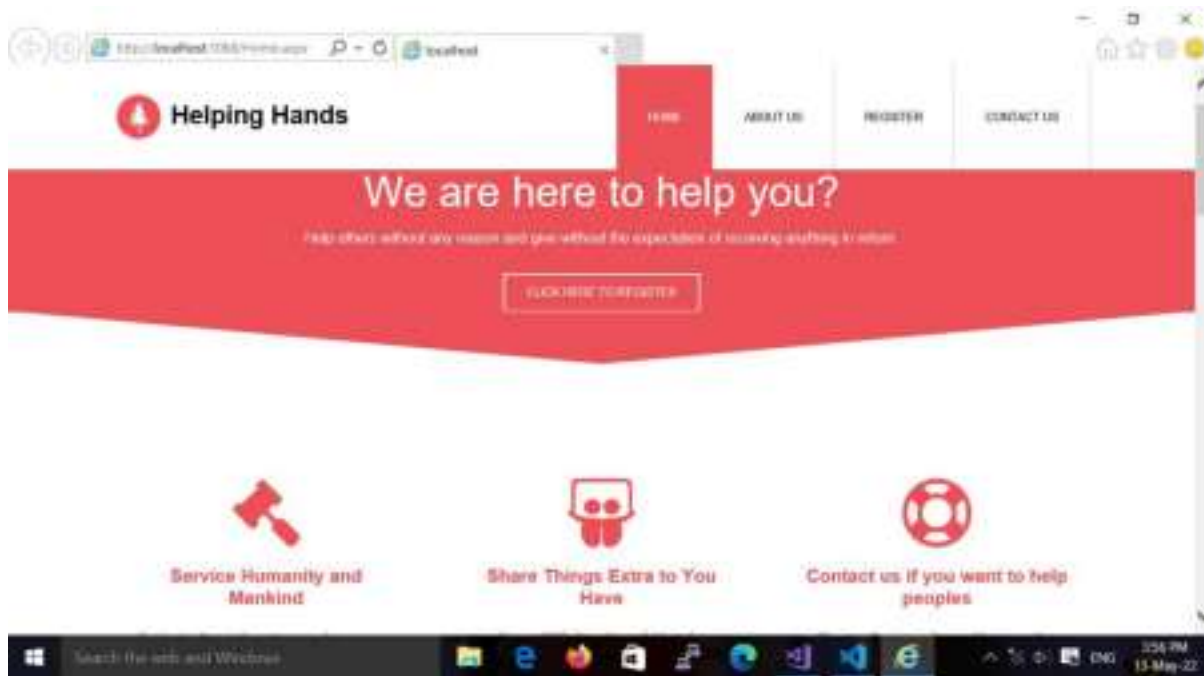
### 5.1 Develop Prototyping

The prototype of this website was developed based on the results of the design stage. The system is made using the java script and C# languages with CSS framework for the styling methods. While ASP.net is used on server side.

### 5.2 Implementation

This is the final phase where the system will be developed. We use Geotag to integrate GPS and GIS. It also incorporates hotspots pinpoint using the Geotag location, Google Maps Engine API, Google Maps Direction API. Unit testing, Integration testing, and Systems testing were performed to test this system.

Fig 2 is the home page for registration. Fig 3 is the contact us page through which users can share their feedback. Fig 4 is the login page, having three types of logins; Admin, Volunteer, and Organisation. Fig. 5 is an example of user interface for donors. The features of this system explain various ways user can contribute. Another additional feature are the lists of the local charitable societies available with their contact details and also the payment gateway for volunteers to help financially.



2. Home Page

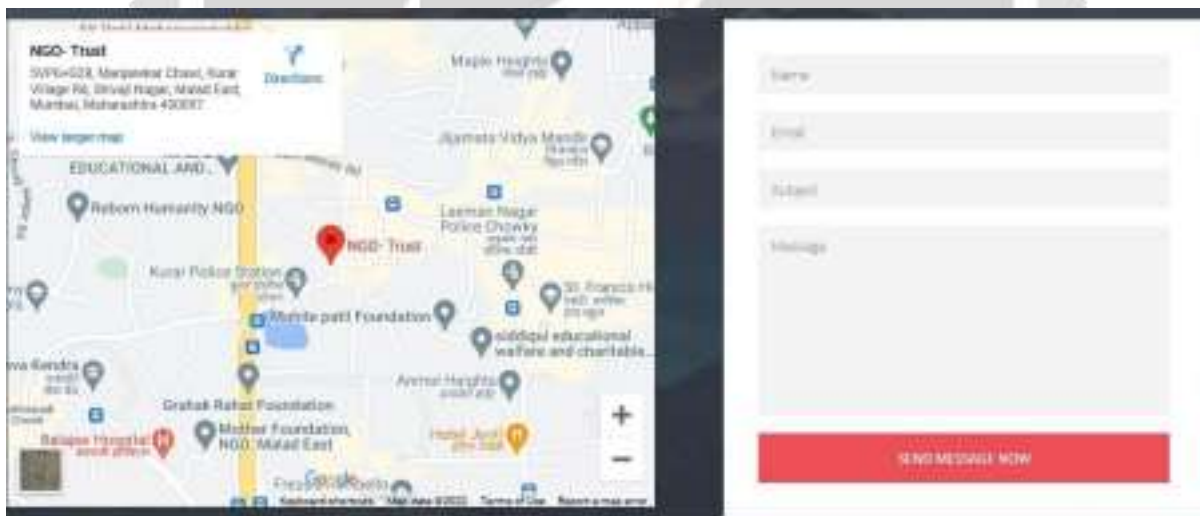


Fig 3. Contact US

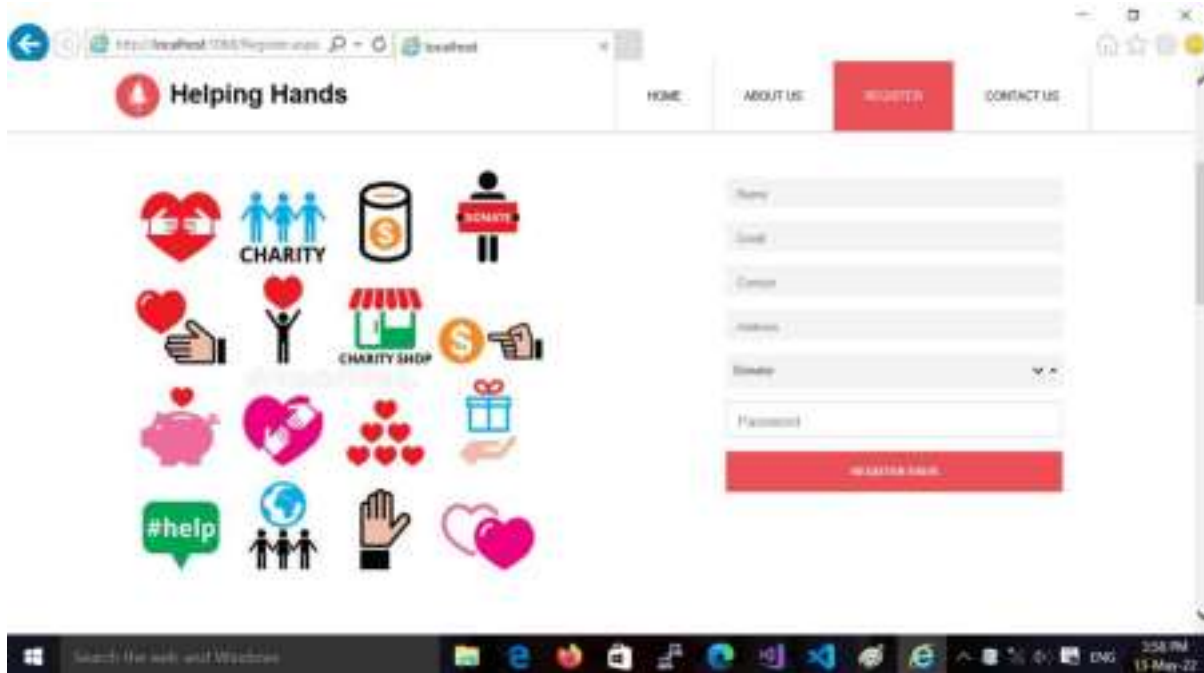
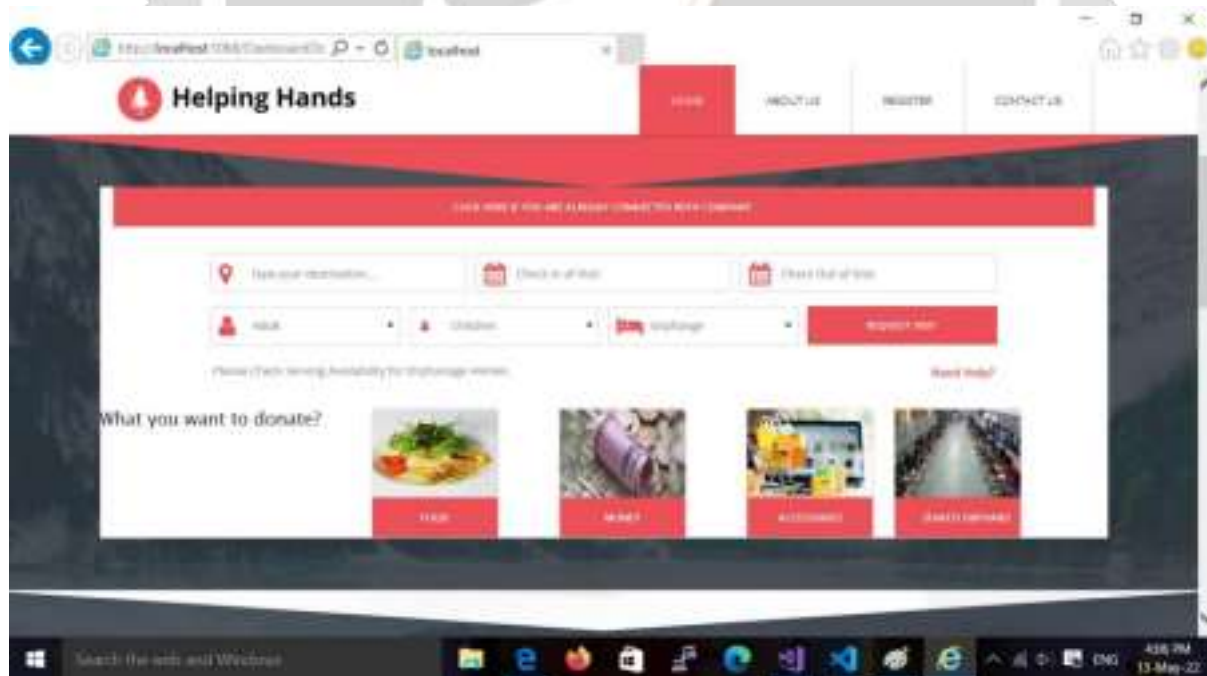


Fig 4. Design



1. Donor Dashboard

## 6. CONCLUSIONS

Our research has investigated the problems of food waste that has many serious side effects economically and socially. However, this way, the excess food can be prevented from going waste or at least decreased using political rules and technology. This technology is beneficial for food waste management in India. It aims to encourage better food management and tackle the hunger problems. Our proposed system should reduce food wastage by facilitating food sharing in Indian community. This work is a first step towards designing a better system to reduce daily food waste in India.

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