Food Sharing Application for Reducing Wastage

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Abstract---"In the face of global hunger, it is a well acknowledged truth that the challenge lies not in the scarcity of food but rather in ensuring equitable access to it. Shockingly, approximately one-third of the world's food supply goes to waste, despite the world's current capacity to produce enough food to nourish every individual on our planet. To contribute to solving this critical issue, we have developed an Android-based application. This innovative platform is designed to empower individuals and organizations to donate surplus food to those in need. The primary objective of this project is to streamline the process of food donations while fostering vital connections between donors and recipients. Our application serves as a collaborative hub, bringing together hostels, hotels, restaurants, as well as Non-Governmental organizations (NGOs) and volunteers. With four integral modules, including administration, NGO support, volunteer engagement, and donor participation, we aim to efficiently bridge the gap between food surplus and food insecurity. The ubiquity of smartphones with active internet connectivity positions this product to be accessible to the majority of the population, making it a practical and impactful solution to combat food waste and hunger on a global scale."

Keywords: Global Hunger, Food scarcity, Food waste, Active internet connectivity, Global scale.

1. Introduction

One-third of the food produced worldwide is wasted annually. The issue of food waste is a global crisis that has far-reaching consequences for both hunger and the environment. Shockingly, one-third of the world's food production is wasted annually, a staggering amount that is four times what would be needed to combat worldwide undernutrition. Tragically, every thirteen seconds, a child succumbs to the effects of hunger, while over 2 billion people suffer from malnutrition, despite the fact that the world produces more than enough food to feed everyone on the planet.

A meta-analysis conducted by the United Nations Environment Programme in 2021 uncovered the troubling fact that food waste is a pervasive problem across countries, regardless of their level of economic development. The analysis estimated that the global food waste amounted to a staggering 931 million tonnes. In the United States, approximately 35 to 40% of food goes to waste, much of which is perfectly edible and nutritious. Even if just 1/4 th of the total food waste worldwide could be rescued, it would be sufficient.

India, a densely populated nation, is also grappling with the issues of food wastages. Approximately 67 million tonnes of food waste are generated in India annually, valued at around Rs 92,0000 crores. This amount could easily sustain the entire states of Bihar for a whole year, highlighting the stark paradox of a country struggling to feed its population while squandering a significant portion of its food resources. This contradiction places India in a challenging position, ranking 103rd in the Global Hunger Index while the average household wastes 50kg of food per person each year, with 15% of the population undernourished.

Food waste is not solely a consumer or demand-side problem; it is equally a producer or supply-side issues. Inadequate infrastructure for reducing waste exacerbates the problem. India's estimated 10 million weddings annually contribute significantly to its annual food wastages, amounting to 14 billion US dollar. Alarmingly, more than 25% of food prepared for weddings ends up in the garbage. Moreover, a substantial portion of food waste originates from restaurants.

A survey in Mumbai revealed that most of the restaurant have an excess preparation of 15-20%, with the majority of them disposing of the surplus food rather than donating it. Out of 100 restaurants surveyed in Mumbai, only three had arrangements with NGOs and food banks to distribute surplus food, highlighting the need for greater efforts to reduce food waste in the restaurant industry, which is abundant with over 30,000 establishments in Mumbai alone. Addressing these issues requires a concerted effort on both the demand and supply sides and a significant investment in infrastructures to curb food waste and alleviate the pressing issues of global hunger.

In the face of a stark increases in the wastages of essential resources such as food, clothing, books, and more, there's an urgent call for charitable initiatives and donations. Introducing "Helping Hands", a novel internet-based application designed to address this pressing issues. This platform serves as a bridge between those willing to donate their old belongings and surplus food and the individuals and organizations in direct need. The motivation behind the creation of this inefficiencies within the existing donation systems. "Helping Hands" aims to revolutionize the way we contribute to the betterment of society by streamlining the process of donating various items over the Internet.

This innovative product demonstrates its effectiveness in facilitating donations to organizations and individuals in need. It holds the potential to significantly reduce the wastages of vital resources like food, clothing, books and other essential items. "Helping Hands" not only represents a practical solution to the growing problems of resources wastages but also embodies the spirit of community and compassion in the digital age, bringing together those with resources to spare and those who can benefit from them.

2. Literature Review

This research paper introduces a comprehensive approach to address the critical issue of food wastage and bridge the gap between individuals willing to share surplus food and NGOs dedicated to distributing it to those in need. Comprising four essential modules, this innovative instrumentation serves as a vital link between food donors and NGOs. Donators are empowered to post details and information about the food they wish to share, while registered NGOs are promptly notified about the availability of surplus food. Building on the insight gained from existing literature, this paper presents a strategy aimed at enhancing the supply chain, optimizing resource management, and streamlining the process of food delivery.

In a related study tilled "Beyond Food Sharing: Supporting Food waste Reduction with ICTS, "published in 2016, the focus was on ensuring the quality of food for individuals of all backgrounds.

Despite growing awareness about the importance of reducing food wastages and managing excess food, the precise role of Information and Communication Technologies (ICTs) in this context remained unclear and relatively unexplored.

Another notes worthy paper, "Food Donation Portal", published in 2015, summarized the evolving landscapes of food donation activities and the connection between food donors and the NGOs and social groups. However, a notable limitation of this paper was the absences of GPS tracking capabilities, which meant that donors had to manually search for the nearest social groups or NGOs. These insights underscore the need for continued innovation and the improvement in leveraging technology to combat food wastage and ensure that surplus food reaches those who need it most efficiently and effectively.

2.1 Existing **system**

In response to the existing challenges in the system of sharing surplus food, there is a pressing need for a more efficient and user-friendly solution. Currently, individuals and social help groups rely on physical visits to restaurants and donors to facilitate food sharing, leading to issues such as communication barriers, difficulty in locating donation sources, and missed opportunities for collection. Effective communication and access to distribution details are vital for volunteers, as well as raising awareness about the work of NGOs and volunteers within the community.

The shortcomings of the existing system are evident:

1. Limited Reach: Food donations may not reach individual in different localities, restricting the impact of food-sharing initiatives.
2. Manual Search: Donors must manually seek out NGOs and social organizations, making the process cumbersome.

3. Complexity and Time Consuming: The current system is intricate and timeconsuming, resulting in inefficiencies.
4. Data Redundancy: There is a risk of redundant data and information within the system, leading to leading to confusion and inefficiencies.

To address these issues, a more streamlined and technology-driven approach is required to connect donors, volunteers, and recipients efficiently. This new approach aims to bridge the gaps in the current system, enabling wider food distribution and reducing food wastage effectively.

2.2 Proposed system:

The proposed system is dedicated on Android-based application designed to serve as a platform for individuals to effortlessly donate and distribute their surplus food to those in need. This application presents a practical solution, particularly relevant in countries like India, to facilitate convenient food donations. The system comprises four key modules: admin, NGOs, volunteers, and users. Each of these stakeholders must register on the application by providing their relevant details. The administrator holds the authority to oversee all data and is responsible for approving or rejecting requests. Admin privileges include approving registrations, managing logins, and coordinating the collection of food items from donors. The Android-based application has been developed using Android Studio 4.0.3, incorporating Java and XML for its functionality. To ensure secure authentication and real-time database management, Firebase technology has been integrated into the system. Additionally, the application leverages the Google maps API to determine the current location of users and visualize these locations on Google Maps. When a user registers and expresses a desire to either donate or receive food, this information is stored in the real-time database. This data can be retrieved whenever another user intends to donate or receive food. Users are seamlessly directed to Google Maps for easy navigation to delivery or pickup locations.

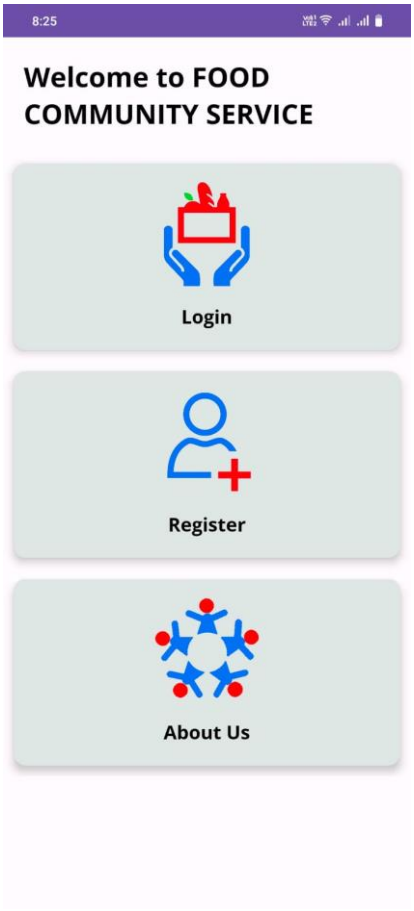

Fig.1:-Home Page Module

3. Modules

3.1 Login & Registration:

Our dedication to user privacy and data security is fundamentally based on the login and registration process of our application. We have developed a solid system in this phase that enables both guests and agents to set up individual accounts. Users must register by providing basic personal data including their name, email address, and a strong password. We have put in place safeguards like email or phone number verification to increase security, making sure that only authorized individuals may access our platform.

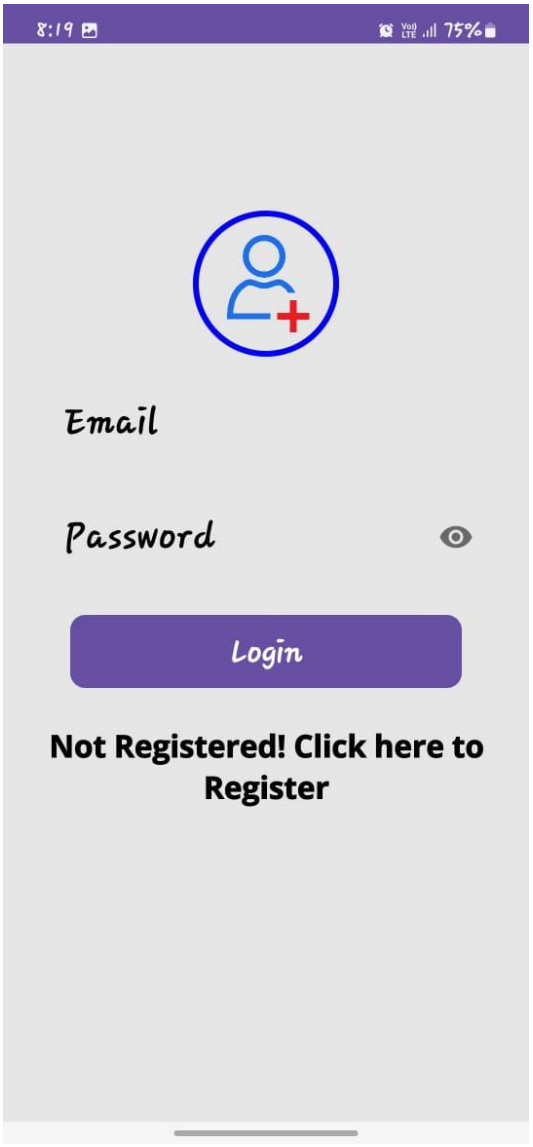

Fig.2:-Login Page Module

3.2 Admin Module:

The administrator is key to controlling and administering the platform's activities in our system's administrative module. This entails keeping through records of the agents and the donor's information. The administrator makes sure that these specifies are entered correctly and securely kept, ensuring that the data is always current and private.

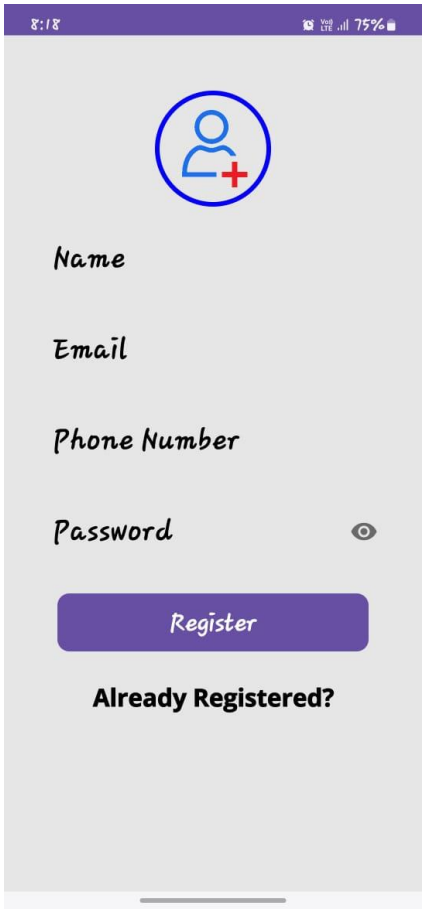

Fig.3:-Registration Page Module

3.3 Dashboard Module

A mobile app's dashboard acts as a centralised, visual interface that gives users instant access to the most important data, features, and functionalities. A dashboard's layout and content are intended to provide users with an easy-to-use and effective means of interacting with the application. The following are typical uses for dashboards in mobile apps, along with their features:

- Dashboards usually show an overview of key data or metrics pertaining to the main features of the application. Users can quickly view the current status of their data or activity with this.
- Users might be able to alter their dashboard to suit their priorities and tastes. This can entail shifting around widgets, deciding which data to show, or picking out particular elements to draw attention to.

- Dashboards frequently have widgets or shortcuts that offer quick access to the app's most used features.

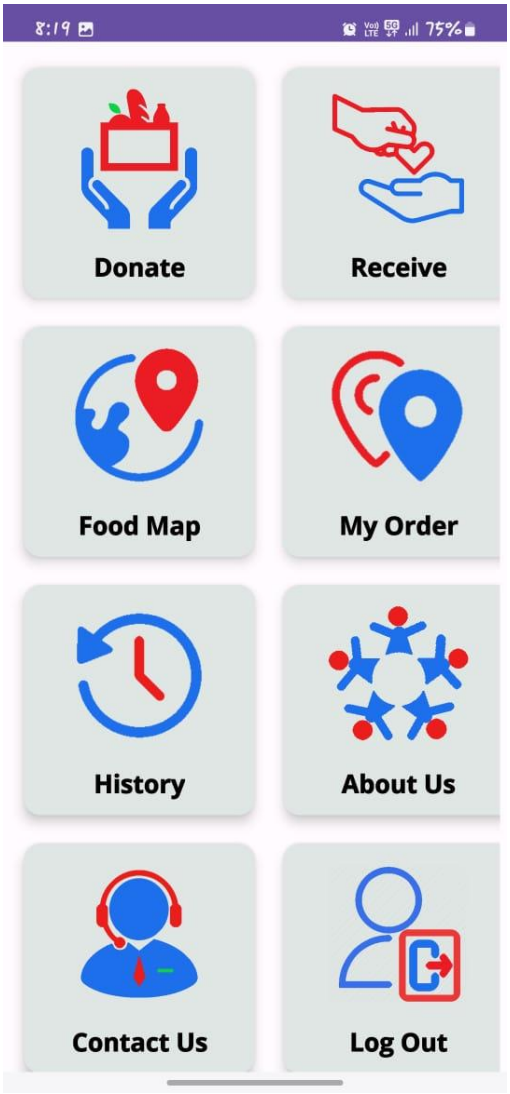

Fig.4:-Dashboard Page Module

3.4 Donator Module:

We enable people and organizations to have a real impact by donating extra Food to these in need especially, orphanages orphanage's the donator module of our program. Donors are essential to our effort to reduce food waste and assist marginalized communities.

Donors can start the process by using our platform to provide orphanages their extra food supplies. They can easily supply information about the food that is available, guaranteeing a quick and easy donation process.

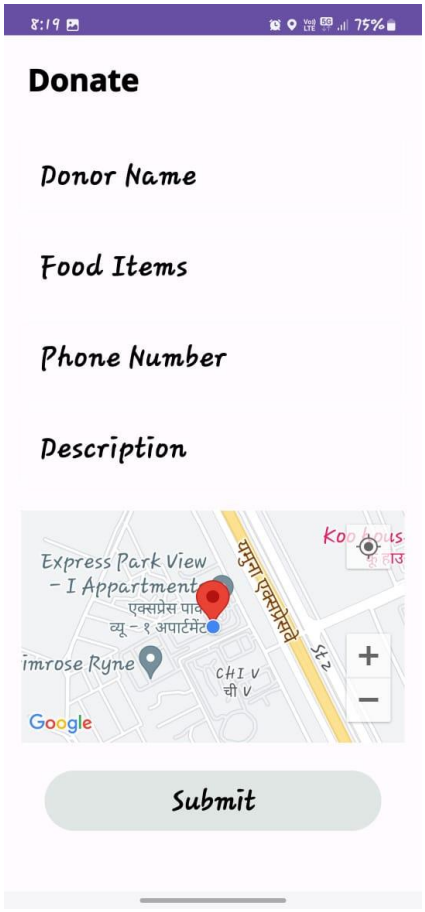

Fig.5:-Donor Page Module

3.5 Receiver Module:

Individual who acts as Receivers are entrusted with crucial tasks in the effective and compassionate management of our platform within the agent module of our program. The efficient distribution of surplus food to those in need depends on these committed Receivers.

Keeping through records of orphans and donors is one of the receiver's key duties. The involves maintaining the accuracy of orphanage data so that we can easily link donors with the nonprofits they want to support. The receiver is essential in establishing thus crucial connection between surplus food and eligible recipients.

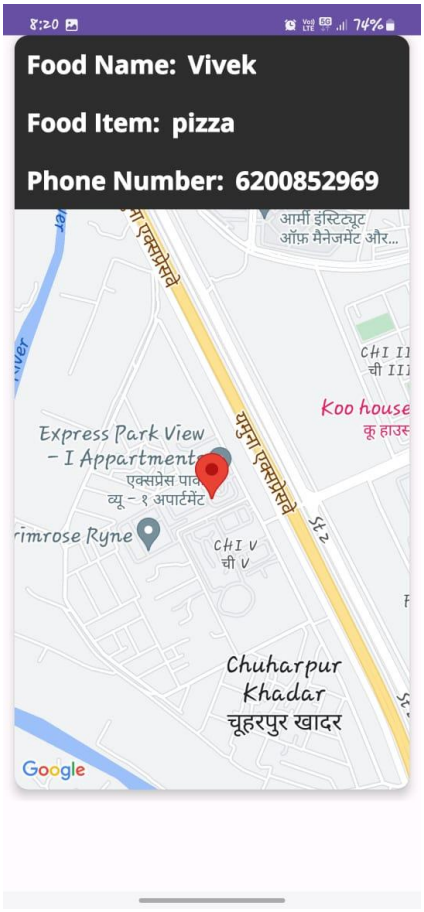

Fig.6:-Receiver Page Module

4. RESULT

The suggested application is a comprehensive approach to decreasing food waste and meeting the demands of diverse nonprofit organizations. Beyond merely food, it is intended to include a wide range of things that can be given to people who need help, including clothing, books, cutlery, and more.

The shocking amount of food wasted in restaurants and cafes is one of the main issues that this program aims to solve. Surplus food can be used to feed the homeless and those in need rather than being thrown out as trash, which is an all-too-common occurrence. Restaurants and cafes don't have to worry about the pickup logistics because they are effectively managed by the company. The two clear advantages of this strategy are that it simultaneously meets the needs of individuals who need to eat while also lowering the carbon footprint and food waste of the restaurants and cafes.

The application plans to incorporate a standardized food information system in terms of future work and potential improvements. Users and of this system would receive comprehensive information on the food's name and expiration date. Using product barcodes to automatically identify the food item and optical character recognition (OCR) techniques to derive the expiration date are two novel approaches.

Although there is a modest boost in convenience with this method, manually entering meal information is still an option.

In order to provide consumers with full information, some businesses have already begun experimenting with QR codes on food packaging. A number of obstacles must be overcome before such a system can be widely adopted. To fill the gap and make sure that extra food and resources are given to those who need them the most, this program offers a workable and efficient alternative in the meantime.

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