**MOBILE BASED FOOD PRODUCT SUPPLYING PLATFORM**

**A PROJECT REPORT**

***Submitted by***

**NITHISH G (201021071)**

***In partial fulfillment for the award of the degree of***

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**IN**

## COMPUTER SCIENCE AND ENGINEERING



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**IFET COLLEGE OF ENGINEERING**

**BONAFIDE CERTIFICATE**

Certified that this project report **MOBILE BASED FOOD PRODUCT SUPPLYING PLATFORM**is the bonafide work of

“**NITHISH G [201021071]”** who carried out the project phase I work under my supervision.

|  |  |
| --- | --- |
| **SIGNATURE**  **Dr. P. Kanimozhi PhD,**  **HEAD OF THE DEPARTMENT,**  Professor,  Department of CSE,  IFET College of Engineering,  Villupuram – 605108 | **SIGNATURE**  **Ms.K. Sowndhariya, M.E**  **SUPERVISOR,**  Assistant Professor,  Department of CSE,  IFET College of Engineering,  Villupuram – 605108 |

Submitted for the Project work and the Viva – Voce examination held on \_\_\_\_\_\_\_\_\_\_\_\_.

**INTERNAL EXAMINER**

**EXTERNAL EXAMINER**

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# ABSTRACT

This report presents the development and implementation of a mobile application designed to tackle the dual challenges of urban excess food waste and hunger-related deaths. The project's primary objective is to create a technologically advanced solution that efficiently connects food donors, volunteers, and individuals in need of food resources. Through this mobile application, donors can seamlessly upload details of surplus food items, including name, cooking time, and location, while volunteers can coordinate the pickup and distribution of donated food to community fridges or directly to individuals in need. Additionally, users can utilize the application to locate nearby community fridges and access donated food resources.

The project aims to address logistical challenges associated with food redistribution by harnessing the power of innovative technology and cost-effective storage solutions. By streamlining food redistribution processes and promoting community engagement, the mobile application seeks to reduce urban food waste, alleviate hunger-related deaths, and foster social cohesion within communities. This report outlines the significance of the project, details the solution approach, presents key findings and outcomes, and provides recommendations for future enhancements to further enhance the impact of the mobile application in addressing food insecurity and waste.

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## CHAPTER 1

## INTRODUCTION

In contemporary urban landscapes, the issue of food insecurity persists alongside the paradoxical problem of excess food waste. While urban centers boast abundance, with surplus food generated by individuals, restaurants, and events, many communities face significant challenges in accessing nutritious meals regularly. This dichotomy highlights systemic inefficiencies in food distribution systems, perpetuating cycles of poverty, malnutrition, and environmental degradation.

**1.1. Background:**

* Overview of the global scale of food waste and hunger-related challenges.
* Discussion on the environmental, social, and economic implications of urban excess food waste and hunger.
* Examination of existing initiatives and solutions addressing food waste and hunger within urban contexts.

**1.2. Rationale for the Project:**

* Identification of the need for a localized solution to address urban excess food waste and hunger within our community.
* Analysis of the limitations of current food redistribution systems and the potential for technology-driven innovations to enhance efficiency and effectiveness.
* Justification for the development of a mobile application as a viable solution to streamline food redistribution processes and promote community engagement.

**1.3. Objectives of the Project:**

* Definition of the overarching goals and objectives of the project, including:
* Reducing urban excess food waste by facilitating the efficient transfer of surplus food resources.
* Alleviating hunger-related deaths by improving access to nutritious food for individuals and families in need.
* Creating a sustainable and inclusive food redistribution network that fosters community participation and collaboration.

**1.4. Scope and Limitations:**

* Description of the scope of the project, including geographical boundaries, target user demographics, and key functionalities of the mobile application.
* Identification of potential challenges and limitations, such as regulatory constraints, technological barriers, and resource constraints, that may impact project implementation and outcomes.

**1.5. Significance of the Project:**

* Discussion on the social, economic, and environmental significance of addressing urban excess food waste and hunger within our community.
* Exploration of the potential benefits of the project, including:
* Reduction of food waste and associated environmental impacts.
* Improvement of food security and nutrition outcomes for vulnerable populations.
* Promotion of community resilience, social cohesion, and civic engagement.

**1.6. Structure of the Report:**

* Overview of the organization and structure of the report, including the main sections and subtopics covered.
* Explanation of how each section contributes to the overall understanding of the project, its objectives, and its outcomes.

Through this introduction, we aim to provide context and rationale for the development of our mobile application solution to address urban excess food waste and hunger-related challenges within our community. By leveraging technology, community engagement, and collaborative partnerships, we aspire to create a more equitable and sustainable food system that benefits all members of society.

**CHAPTER 2**

## LITERATURE SURVEY

# Title : FEED - Food Enduetion and Donation

**Author :** [Saurav Sushil](https://ieeexplore.ieee.org/author/406378434974711) [1]

The Food Endue and Donation (FEED) mobile application emerges as a pivotal solution amidst the escalating concerns over food waste and its multifaceted impacts on the environment and society. Acting as a crucial intermediary, FEED facilitates the connection between food donors and individuals or organizations serving those in need, thereby streamlining the process of redistributing surplus food. Practical trials conducted within student hostels offer tangible evidence of FEED's functionality and usability, providing invaluable insights for further enhancements. Its user-friendly interface ensures accessibility for both donors and recipients, fostering greater engagement and participation.

Moreover, the potential integration with artificial intelligence promises to elevate FEED's efficiency in matching surplus food with specific needs, amplifying its impact. Aligned with the United Nations Sustainable Development Goals, particularly those aimed at poverty reduction and public health improvement, FEED signifies a significant stride towards promoting smart urban living and fostering a more sustainable future. By optimizing the redistribution of surplus food, FEED addresses the critical issue of global hunger while mitigating the adverse effects of food waste on the environment. Ultimately, the introduction of FEED underscores the transformative potential of technology in creating innovative solutions for pressing global challenges, emphasizing the importance of collective action in building a more equitable and sustainable society.

# Title : A Novel Approach for Identification and Donation of Surplus Food using Machine Learning-based Replate App

**Author :** [R. Kavitha](https://ieeexplore.ieee.org/author/37089937950) [2]

This study sheds light on the pressing issue of food waste, particularly focusing on leftover food donations from various sources such as gatherings and hostels. In nations with high population densities like India, where landfills, trash bins, and cluttered city streets are common sights, the problem of food loss takes on added significance. Events like weddings, canteen operations, restaurant services, social gatherings, and family events contribute significantly to the staggering amount of wasted food. However, the issue extends beyond mere economic losses and environmental damage; it underscores broader societal challenges. Rapid lifestyle changes and elevated living standards have also led to wastage of other valuable resources like clothing and consumer goods. To address this multifaceted problem, there's a crucial need to redirect these surplus resources to humanitarian organizations such as old age homes and orphanages, ensuring their utilization rather than disposal.

In this context, the study proposes the development of an internet-based Android application as a potential solution to facilitate effective food distribution. This application serves as a platform to connect food donors with organizations serving vulnerable populations, streamlining the process of surplus food redistribution. By leveraging modern technology and the widespread use of smartphones, the application offers a practical and accessible means for individuals and businesses to contribute to societal welfare. Notably, the digital nature of the platform allows for efficient coordination and communication between donors and recipients, overcoming traditional barriers to food donation and distribution.

Furthermore, the proposed application aligns with broader sustainability goals by promoting the efficient use of resources and reducing waste. By facilitating the transfer of surplus food and other goods to those in need, it not only addresses immediate hunger concerns but also contributes to long-term environmental and social sustainability. Through strategic partnerships and community engagement, the application has the potential to scale up its impact, reaching a wider audience and maximizing resource utilization.

In essence, the study underscores the importance of leveraging technology and innovative approaches to tackle complex societal challenges such as food waste and resource scarcity. By promoting effective food distribution and redirecting surplus resources to those in need, the proposed application offers a practical pathway towards a more sustainable and equitable future.

# Title : An IOTML Based Food Freshness Detection System

**Author :** [Rashmi](https://ieeexplore.ieee.org/author/37089812040)  [3]

This report addresses a critical gap in existing food donation applications by focusing on the verification of food quality, particularly in donations to orphanages. It acknowledges the potential risk of compromised food quality in such donations and aims to provide authentic information regarding the freshness of donated food items. The approach outlined in this paper involves the use of sensors like MQ2 and MQ135 to detect key indicators of food freshness, such as Carbon Monoxide (CO), Ammonia (NH3), and Benzene (C6H6) levels.

By leveraging technology and sensor data, the proposed system offers a reliable method for assessing the quality of donated food items. The development of an interactive platform, utilizing tools like Eclipse IDE and SQLYOG, facilitates the connection between catering services and volunteers involved in the donation process. This platform streamlines the donation process while ensuring that only fresh and safe food reaches the intended beneficiaries.

A key assumption made in this work is that the predicted food sensor values are based on samples collected from a limited set of basic food items. While it may not encompass all possible food items, this approach allows for a practical and efficient classification of food quality as either spoilt or fresh. The methodology prioritizes a high rate of detection, aiming to accurately classify food items before donation.

Overall, the methodology described in this report provides a robust mechanism for verifying the quality of donated food items, thereby enhancing the safety and reliability of food donations to orphanages. By implementing sensors to detect key freshness indicators, the proposed system offers a proactive approach to addressing the issue of compromised food quality in charitable donations.

# Title : An Examination on Food, Clothes and Books Donation Based Android Application

**Author :** [Garima Pandey](https://ieeexplore.ieee.org/author/37089755551) [4]

The premise underlying the creation of our mobile application, "Food For Everything," revolves around addressing a fundamental imbalance in society: the unequal distribution of resources. While some individuals struggle to meet their basic needs of food, clothing, and education, others possess an abundance of these resources but often fail to utilize them effectively. This dichotomy underscores the urgency of establishing a platform that facilitates the exchange of surplus resources with those in need, fostering a sense of community and mutual support.

Our application serves as a conduit for this exchange, allowing users to seamlessly donate items such as food, clothing, and books to individuals or organizations in need. Through a user-friendly interface, donors can easily upload information about their surplus goods, while recipients can browse and request items based on their specific requirements. This direct connection between donors and recipients ensures that donations are channeled efficiently to where they are most needed, thereby maximizing their impact.

One of the key advantages of our program is its emphasis on fostering a sense of connection and reciprocity within the community. By facilitating direct interactions between donors and recipients, our platform not only addresses immediate needs but also fosters a culture of empathy and solidarity. Moreover, by preventing surplus resources from going to waste, particularly in the case of food, we contribute to efforts aimed at reducing food insecurity and environmental degradation.

"Food For Everything" goes beyond simply providing a means for resource exchange; it embodies a broader ethos of social responsibility and collective action. Through partnerships with NGOs and other community organizations, we strive to amplify our impact and reach those who are most marginalized or underserved. Ultimately, our goal is to leverage technology as a tool for positive social change, creating a more equitable and compassionate society where no one is left behind.

# Title : Sharing Food with FoodLifeSavr Smartphone App

**Author :** [Arfandi Andres](https://ieeexplore.ieee.org/author/37089345617) [5]

This research paper addresses a significant societal issue: the wastage of excess food in a world where many struggle with food insecurity. In today's era, where overeating, parties, events, and the availability of ready-to-eat foods contribute to a surplus of food, it's distressing to witness valuable resources being discarded while many go hungry. This paper proposes a solution to mobilize individuals who have excess food to donate it to those in need, thereby reducing waste and alleviating hunger.

The proposed solution comes in the form of a smartphone application designed to facilitate food donation. This application serves as a platform for both new and existing donors to register and participate in the donation process. Donors can log in to the application to monitor the progress of their donations, from selecting the food category and inputting the amount to tracking the pickup by couriers and delivery to recipients.

One innovative feature of the application is the ability for donors to witness the impact of their donations firsthand. Through the use of couriers who take photos of recipients with the donated food, donors can see the tangible results of their contributions, fostering a sense of connection and fulfillment.

Additionally, the application offers a space for donors to engage with each other, sharing experiences, ideas, and perspectives on topics related to food donation. This social aspect not only enhances community involvement but also facilitates learning and collaboration among donors.

By harnessing the power of technology and social connectivity, this mobile application aims to bridge the gap between food surplus and food insecurity. It empowers individuals to take action against food waste and contribute to the well-being of their communities. Ultimately, the goal is to create a more sustainable and equitable food system where no edible food goes to waste, and everyone has access to nutritious meals.

## CHAPTER 3

## PROBLEM STATEMENT

The project confronts the pressing challenges arising from the coexistence of urban excess food waste and hunger-related deaths. Despite the abundance of food resources in urban centers, a considerable portion goes to waste due to inefficient distribution channels, while many individuals and families struggle to access nutritious meals regularly. This imbalance not only exacerbates food insecurity but also contributes to environmental degradation and socioeconomic disparities within communities. Moreover, the lack of streamlined processes and infrastructure for food redistribution further compounds these challenges. Transportation bottlenecks, inadequate storage facilities, and logistical hurdles impede the efficient transfer of surplus food from donors to those in need. As a result, valuable resources are squandered, and vulnerable populations continue to suffer from hunger and malnutrition.

This holistic approach not only addresses the immediate need for food assistance but also promotes long-term sustainability and resilience within communities. By facilitating efficient food redistribution, the project endeavors to minimize food waste, alleviate hunger-related deaths, and foster social cohesion and solidarity among community members. Ultimately, the project represents a concerted effort to transform urban food systems, promoting equitable access to nutritious food while mitigating the adverse impacts of food waste on the environment and public health. Through collaborative partnerships and a commitment to innovation, the project aims to create a brighter, more sustainable future where no one goes hungry in the midst of plenty.

**CHAPTER 4**

## EXISTING SYSTEM

In the current food redistribution landscape, bulk donations of food are predominantly favored and facilitated. Organizations, businesses, and institutions often engage in large-scale donation drives or partnerships with surplus food suppliers to donate significant quantities of food at once. While this approach yields commendable results in terms of volume, it presents limitations and barriers for individuals or smaller entities wishing to contribute.

**4.1. Bulk Donation Norm:**

* + Large-scale donation initiatives are the primary mode of food redistribution in the existing system.
  + Organizations and businesses typically donate surplus food in bulk quantities, often as part of scheduled donation drives or partnerships with food banks or charities.
  + While effective in addressing food waste on a macro level, this approach may not be accessible or feasible for individuals or smaller entities looking to donate.

**4.2. Limitations for Individuals:**

* + Individuals or households with surplus food may face challenges in participating in food redistribution efforts.
  + The requirement for bulk donations may deter individuals from contributing if they do not have large quantities of surplus food to donate.
  + Lack of options for single-item donations restricts the participation of smaller donors, limiting the diversity and inclusivity of food redistribution efforts.

**4.3. Organizational Focus:**

* + Existing food redistribution initiatives often prioritize partnerships with large organizations or surplus food suppliers.
  + While beneficial for securing substantial food donations, this organizational focus may overlook the potential contributions of individual donors or smaller entities.
  + The emphasis on bulk donations may inadvertently marginalize smaller donors, hindering their ability to participate in addressing food waste and hunger.

**4.4. Barriers to Entry:**

* + The emphasis on bulk donations creates barriers to entry for individuals or smaller entities wishing to contribute to food redistribution efforts.
  + Limited options for single-item donations may discourage potential donors from participating, perpetuating the perception that food redistribution is exclusive to large organizations or institutions.

**4.5. Missed Opportunities:**

* + The existing system may overlook valuable opportunities for community engagement and grassroots participation in food redistribution efforts.
  + By focusing primarily on bulk donations, the system may miss out on the potential contributions of individual donors, community groups, or small businesses to address food waste and hunger.

**4.6. Disadvantages of the Existing System:**

**Limited Accessibility:** The emphasis on bulk donations may exclude individuals or smaller entities from participating in food redistribution efforts, as they may not have the capacity to donate large quantities of food.

**Wastage of Potential Resources:** The focus on bulk donations overlooks the potential contributions of individual donors or smaller entities, resulting in missed opportunities to utilize surplus food effectively.

**Inefficiency in Addressing Immediate Needs:** Bulk donations may not always align with the immediate needs of communities facing food insecurity, as they may be less flexible and responsive to changing demand.

**Marginalization of Smaller Donors:** The existing system may inadvertently marginalize smaller donors by prioritizing partnerships with large organizations or surplus food suppliers, leading to a perception that food redistribution efforts are exclusive to certain entities.

**Environmental Impact:** Inefficient allocation of surplus food resources, often associated with bulk donations, may contribute to environmental degradation through increased food waste and associated carbon emissions.

**CHAPTER 5**

**PROPOSED SYSTEM**

In response to the limitations and challenges of the existing system, we propose a revolutionary approach to food redistribution that prioritizes inclusivity, flexibility, and community engagement. Our proposed system aims to democratize food donation by introducing a platform that facilitates seamless single-item donations, empowering individuals, households, and small businesses to contribute to the fight against food waste and hunger.

**5.1. Democratizing Food Donation:**

* + Our proposed system shifts away from the bulk donation norm and embraces a more inclusive approach that allows for single-item donations.
  + By democratizing food donation, we aim to lower barriers to entry and encourage widespread participation in food redistribution efforts.

**5.2. Seamless Donation Platform:**

* + We envision a user-friendly mobile application that serves as a centralized platform for facilitating single-item donations.
  + The application will enable individuals, households, and small businesses to easily upload details of surplus food items for donation, including descriptions, quantities, and expiration dates.

**5.3. Flexibility and Accessibility:**

* + Our proposed system prioritizes flexibility and accessibility, ensuring that anyone can contribute to food redistribution efforts, regardless of the quantity of surplus food they have available.
  + By allowing for single-item donations, we open up opportunities for individuals and smaller entities to make meaningful contributions to addressing food waste and hunger.

**5.4. Community Engagement and Empowerment:**

* + Our system seeks to foster community engagement and empowerment by providing individuals with a platform to directly participate in food redistribution efforts.
  + Through the act of donating surplus food items, individuals can take an active role in supporting their communities and making a positive impact on food insecurity.

**5.5. Targeted Distribution and Response:**

* + By enabling single-item donations, our proposed system facilitates more targeted distribution of food resources based on specific needs and preferences within communities.
  + This targeted approach allows for a more responsive and efficient allocation of donated food items, ensuring that resources are utilized effectively to address immediate needs.

**5.6. Environmental Sustainability:**

* + Our system promotes environmental sustainability by reducing food waste and associated carbon emissions.
  + By encouraging smaller, more targeted donations, we minimize the risk of food spoilage and maximize the utilization of surplus food resources.

**5.7. Empowering Small Donors:**

* + Our proposed system empowers small donors by recognizing the value of their contributions and providing them with a platform to make a tangible difference in the fight against food waste and hunger.
  + By amplifying the voices and efforts of individual donors, we build a more resilient and inclusive food redistribution network that harnesses the collective power of communities.

**5.8. Advantages of the Proposed System:**

**Inclusivity and Accessibility:** The proposed system allows for single-item donations, making food redistribution efforts accessible to individuals, households, and small businesses who may not have the capacity for bulk donations.

**Flexibility and Versatility:** Embracing single-item donations provides greater flexibility in the types and quantities of food items that can be contributed.

**Community Engagement and Empowerment:** The proposed system fosters community engagement and empowerment by providing individuals with a platform to directly contribute to addressing food insecurity.

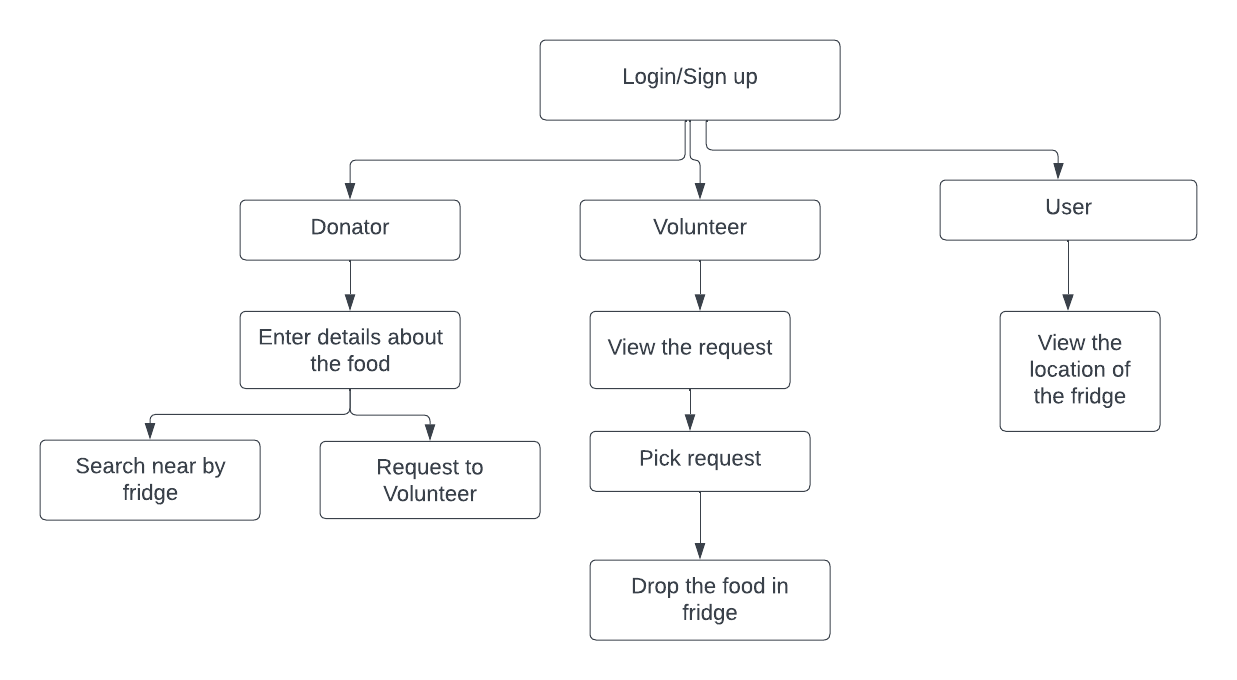
**Targeted Distribution and Response:** Single-item donations enable more targeted distribution of food resources based on specific needs and preferences within communities.

**Environmental Sustainability:** By encouraging smaller, more targeted donations, the proposed system minimizes the risk of food spoilage and waste, promoting environmental sustainability.

In summary, the proposed system offers numerous advantages over traditional bulk donation approaches, including greater inclusivity, flexibility, community engagement, and environmental sustainability.

## CHAPTER 6

## SYSTEM ARCHITECTURE

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## Figure 6.1

**Explanation :**

**6.1. Donator Signup and Login:**

* **Registration Process:** Donators initiate the process by signing up on the mobile application. They provide essential details such as name, email address, contact number, and preferred login credentials.
* **Account Verification:** After registration, donators receive a verification email or SMS to confirm their identity and activate their account.
* **Login:** Once verified, donators can log in to the application using their registered email address or username and password.

**6.2. Food Donation Details Entry:**

* **Food Description:** Donators enter details of the surplus food items they wish to donate, including name, description, quantity, and any relevant information such as cooking time or dietary restrictions.
* **Expiry Date:** Donators specify the expiry date or best-before date of the donated food items to ensure transparency and safety for recipients.
* **Location Identification:** Donators provide the location where the surplus food items are available for pickup, either by manually entering the address or using geolocation services provided by the application.

**6.3. Nearby Fridge Search:**

* **Fridge Locator:** Donators have the option to search for nearby community fridges using the application's built-in location services.
* **Fridge Availability:** The application displays a list of available community fridges in the vicinity, along with their locations, opening hours, and capacity status.
* **Fridge Selection:** Donators select a suitable community fridge based on proximity, capacity, and convenience for donating the surplus food items.

**6.4. Volunteer Request for Pickup:**

* **Request Initiation:** Donators initiate a request for food pickup by selecting the option to request a volunteer through the application.
* **Volunteer Availability:** The application identifies available volunteers in the vicinity and displays their profiles, including ratings, reviews, and proximity to the donator's location.
* **Request Submission:** Donators submit a request for pickup, specifying the preferred pickup time and location, and wait for a volunteer to accept the request.

**6.5. Volunteer Confirmation and Coordination:**

* **Request Acceptance:** Volunteers receive notifications of pending pickup requests and review the details provided by the donator.
* **Confirmation:** Volunteers confirm their availability to fulfill the pickup request and accept the assignment through the application.
* **Communication:** Volunteers and donators may communicate directly through the application to coordinate pickup details, address any concerns, or provide updates on the status of the donation.

**6.6. Volunteer Confirmation:**

* + Upon receiving a pickup request from a donator, volunteers review the details provided, including the location, pickup time, and quantity of food items.
  + Volunteers assess their availability and confirm their willingness to fulfill the pickup request through the mobile application.
  + Confirmation of volunteer availability triggers a notification to the donator, indicating that a volunteer has accepted the request for food pickup.

**6.7. Food Pickup Process:**

* + Volunteers coordinate with the donator to finalize the pickup logistics, including the exact pickup location and any additional instructions for accessing the surplus food items.
  + Volunteers arrive at the designated pickup location at the agreed-upon time and collect the surplus food items from the donator.
  + During pickup, volunteers verify the accuracy of the donation details, ensuring that the quantity and condition of the donated food items match the information provided by the donator.

**6.8. Search for Nearby Community Fridge:**

* + After collecting the surplus food items from the donator, volunteers use the mobile application to search for nearby community fridges available for donation.
  + The application utilizes geolocation services to identify community fridges within the vicinity of the volunteer's current location, displaying relevant information such as distance, capacity, and current status (e.g., full or available for donation).
  + Volunteers assess the suitability of each community fridge based on factors such as capacity availability, accessibility, and operational status.

**6.9. Fridge Selection and Food Loading:**

* + Volunteers select a suitable community fridge from the list of available options, taking into account factors such as proximity, capacity availability, and operational status.
  + Upon arrival at the selected community fridge, volunteers verify its availability for donation and assess the available space for loading the surplus food items.
  + Volunteers carefully unload the donated food items from their vehicle and load them into the designated compartments or shelves within the community fridge, ensuring proper organization and storage to maximize space utilization.

**6.10. Confirmation of Donation:**

* + After loading the surplus food items into the community fridge, volunteers use the mobile application to confirm the completion of the donation process.
  + The application prompts volunteers to provide details of the donation, including the quantity of food items donated, the location of the community fridge, and any additional comments or observations regarding the donation process.
  + Confirmation of the donation triggers notifications to the relevant stakeholders, including the donator and the administrators of the community fridge, providing real-time updates on the status of the donated food items.

**6.11. Confirmation of Donation:**

* Users access the mobile application either by logging in with their existing credentials or by creating a new account if they are first-time users.
* Upon successful login, users are presented with the application's home screen, which provides access to various features and functionalities, including searching for nearby community fridges.

**6.12. Nearby Fridge Search:**

* Users navigate to the "Find Fridge" or "Search" section of the application, which allows them to search for nearby community fridges available for food pickup.
* application utilizes geolocation services to identify community fridges within the user's vicinity, displaying relevant information such as distance, operating hours, and available food items.

## CHAPTER 7

## METHODOLOGY

**7.1. Needs Assessment:**

* + Conduct surveys, interviews, and focus groups with stakeholders including potential users, food donors, volunteers, and community organizations to understand their needs, challenges, and preferences related to food redistribution.
  + Analyze existing data on food waste, hunger rates, and distribution channels to identify gaps and opportunities for improvement in the current system.

**7.2. Requirement Analysis:**

* + Define the functional and non-functional requirements of the mobile application based on the findings from the needs assessment phase.
  + Identify key features and functionalities of the application, such as user registration, food donation management, volunteer coordination, and community fridge accessibility.

**7.3. Technology Selection:**

* + Evaluate various technology platforms and frameworks suitable for developing a mobile application, considering factors such as scalability, compatibility, security, and cost-effectiveness.
  + Select appropriate technologies for frontend development and backend based on project requirements and team expertise.

**7.74. Agile Development Approach:**

* + Adopt an agile software development methodology, such as Scrum or Kanban, to facilitate iterative and incremental development of the mobile application.
  + Break down the project into manageable sprints or iterations, with defined goals, timelines, and deliverables for each iteration.

**7.5. Prototyping and User Testing:**

* + Develop prototypes or mockups of the mobile application to visualize the user interface and user experience.
  + Conduct usability testing sessions with stakeholders to gather feedback on the prototype and identify areas for improvement in terms of navigation, functionality, and user satisfaction.

**7.6. Iterative Development and Refinement:**

* + Implement feedback from user testing sessions to refine the design and functionality of the mobile application.
  + Continuously iterate on the development process, incorporating new features, addressing bugs and technical issues, and optimizing performance based on user feedback and project requirements.

**7.7. Integration and Testing:**

* Integrate frontend and backend components of the mobile application to ensure seamless communication and functionality.
* Conduct comprehensive testing, including unit testing, integration testing, and user acceptance testing, to identify and resolve any issues or discrepancies in the application.

**7.8. Deployment and Rollout:**

* Deploy the mobile application to app stores for public access and download.
* Implement a phased rollout strategy to gradually introduce the application to users, monitor performance, and gather feedback for further improvements.

**7.9. Training and Support:**

* Provide training sessions and resources for users, volunteers, and community organizations on how to use the mobile application effectively for food donation, volunteer coordination, and food retrieval.
* Establish a support system, including documentation, FAQs, and helpdesk services, to address any technical issues or questions encountered by users during their interactions with the application.

**7.10. Monitoring and Evaluation:**

* Monitor the usage and performance of the mobile application through analytics tools and metrics tracking.
* Evaluate the impact of the application on food redistribution efforts, including metrics such as the number of food donations facilitated, volunteer engagement levels, and user satisfaction ratings.
* Gather feedback from stakeholders through surveys, interviews, and feedback forms to assess the effectiveness of the application in addressing food waste and hunger-related challenges within the community.

## CHAPTER 8

## MODULE DESCRIPTION

Certainly, let's expand on each module in more detail:

**8.1. Donator Module:**

- The Donator Module enables individuals, households, and businesses to contribute surplus food items to the community fridge network through the mobile application.

* **Food Donation Management:** Donators can upload details of surplus food items, including descriptions, quantities, and expiration dates, to the application.
* **Location Identification:** Donators can specify the location where the surplus food items are available for pickup, either manually or using geolocation services.
* **Volunteer Request:** Donators can request volunteer assistance for food pickup and donation through the application, coordinating pickup logistics and timing.

**8.2. Volunteer Module:**

- The Volunteer Module facilitates the coordination and execution of food pickup and donation tasks by volunteers who assist donators in transferring surplus food items to community fridges.

* **Pickup Request Management:** Volunteers receive notifications of pending pickup requests from donators and confirm their availability to fulfill the requests.
* **Route Optimization:** Volunteers can access navigation tools within the application to optimize pickup routes and efficiently navigate to donator locations.
* **Communication with Donators:** Volunteers can communicate directly with donators through the application to coordinate pickup details, address any concerns, and provide updates on the status of the donation process.

**8.3. User Module:**

- The User Module empowers individuals in need to access and retrieve surplus food items from community fridges, promoting food accessibility and addressing hunger-related challenges within the community.

* **Fridge Search and Access:** Users can search for nearby community fridges available for food pickup through the application, accessing information on available food items and fridge locations.
* **Food Retrieval:** Users can visit designated community fridges to retrieve surplus food items, scanning QR codes or using unique identifiers provided by the application to confirm pickup and ensure accountability.
* **Feedback and Rating:** Users can provide feedback on their experience with the application and the quality of donated food items, contributing to continuous improvement efforts and enhancing user satisfaction.

Each module is designed to cater to the specific needs and roles of different stakeholders involved in the food redistribution process, fostering collaboration, efficiency, and community engagement in combating food waste and hunger within the community.

**CHAPTER 9**

## RESULTS

**CHAPTER 10**

## CONCLUSION & FUTURE WORK

The development of our mobile application represents a significant leap forward in addressing the dual challenges of urban excess food waste and hunger-related issues. Through the seamless integration of technology and community engagement, we've created a platform that not only facilitates the donation of surplus food but also fosters a sense of collective responsibility and empowerment among individuals and organizations. With the Donator, Volunteer, and User modules at its core, the application streamlines the process of food redistribution, making it easier for donors to contribute, volunteers to coordinate pickups, and individuals in need to access nutritious food resources.

Looking ahead, there are several avenues for future work and expansion to amplify the impact of our efforts. One key area is the expansion of our community fridge network to reach underserved areas and ensure equitable access to surplus food resources. By strategically locating community fridges in areas with high levels of food insecurity, we can maximize the reach and impact of our redistribution efforts. Additionally, enhancing volunteer engagement through innovative initiatives such as gamification and rewards programs can help sustain momentum and foster a sense of ownership and pride among volunteers.

Integrating sustainability practices into our operations is another crucial aspect of our future work. By promoting food preservation techniques, encouraging eco-friendly packaging, and facilitating composting of food waste, we can minimize our environmental footprint and promote more sustainable food redistribution practices. Furthermore, forging strategic partnerships with local businesses, food suppliers, and governmental organizations can help us leverage additional resources, expertise, and networks to amplify our impact and reach a broader audience.

Continuous improvement and innovation will also be central to our future endeavors. By gathering feedback from stakeholders, monitoring application usage metrics, and conducting regular evaluations, we can identify areas for improvement and refinement in our mobile application and redistribution processes. This iterative approach will ensure that we remain responsive to the evolving needs of our community and continue to make meaningful strides towards building a more resilient, sustainable, and inclusive food system for all.

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