FOOD FRESH: AN ANDROID APPLICATION TO DISTRIBUTE FOOD

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Abstract: Food insecurity is a pressing issue that affects millions of people worldwide, particularly those in low-income communities. Hunger and malnutrition have severe consequences for an individual's health and well-being. Non-profit organizations play a crucial role in addressing food insecurity by providing food and services to those in need. These organizations heavily rely on food donations from generous donors. To alleviate the burden on individuals who require food to survive, this paper proposes the development of a mobile application called Food- fresh. This application aims to ensure efficient food distribution and reduce food waste, especially during emergencies such as the COVID-19 pandemic. Foodfresh utilizes GPS technology to track the locations of donors and volunteers, ensuring the safety of volunteers and the delivery of fresh food to those in need.

The Foodfresh application is designed to tackle the challenges of food insecurity by streamlining the process of food distribution. By leveraging mobile technology and GPS tracking, Foodfresh offers several benefits:

Foodfresh aims to connect donors with non-profit organiza- tions, making it easier for individuals in need to access available food resources. Through the application, donors can quickly and conveniently offer their surplus food, reducing barriers to food access for vulnerable populations.

The application utilizes GPS technology to track the locations of both donors and volunteers. This feature allows non-profit organizations to efficiently distribute food by matching available resources with the nearest volunteers or organizations that can collect and distribute the food to those in need. By optimizing routes and reducing travel time, Foodfresh minimizes delays and ensures prompt delivery.

By facilitating the timely and efficient distribution of surplus food, Foodfresh plays a crucial role in reducing food waste. The application enables donors to quickly find recipients for their excess food, ensuring it reaches those in need before it expires.

This is the initial version of this application since we are using the agile method of development based on the feedback, new features can be implemented in the future.

Index Terms: **hunger, food insecurity, food distribution.**

1. INTRODUCTION

Poverty is characterized by the inability to access basic necessities, leading to a cycle of poverty across generations. Food, as a fundamental necessity for survival, often goes to waste despite the presence of people in need. Sharing food is seen as a solution to both reduce food waste and combat hunger by ensuring that those in need have regular access to food.

The act of sharing food involves individuals and organiza- tions committing to share excess food rather than allowing it to go to waste. This practice plays a crucial role in estab- lishing social structures, promoting cooperative behavior, and shaping individual life histories. Food banks and pantries also contribute to these goals by feeding the hungry and fostering community connections. Volunteers help us to transport this food to needy people.[10]

The main objective of the project discussed is to develop a mobile application that facilitates food donations and tracks the entire process. The application acts as a bridge between food donors and volunteers, allowing them to connect through contributions both socially and economically to distribute surplus food. The application will be continuously improved based on modern-day requirements following an agile devel- opment approach.

This Android application serves as a platform connect- ing food donors, such as households, restaurants, and event venues, with volunteers. It offers a convenient means for both donors and volunteers to engage with the app. The user interface (UI) has been carefully designed to ensure a seamless experience for the donors, enabling them to easily place a food donation within just 60 seconds. By utilizing this application, donors and volunteers can establish a quick and efficient connection. Donors can swiftly navigate the app's intuitive UI to submit their food donations, allowing them to contribute with minimal time and effort. The aim is to provide a user-friendly experience that encourages more individuals and establishments to participate in the dona-tion process, ultimately leading to increased food availability for those in need.

LITERATURE REVIEW

2.1 Food Bank In Dhaka

Since May 2016, the Prochesta Foundation has become a charity organization. Their major goal is to gather leftover food from weddings and provide it to those in need in the city of Dhaka. In order to contact volunteers for foodcollecting at wedding venues, they just developed a new project called "Food Bank" and established a hotline. Donors can get in touch with the group to make arrangements for leftover food collection through their Facebook page. The Prochesta Foundation only functions in Dhaka at the moment.[5] The text also covers the creation of mobile and online apps forvarious uses in the [21–30] range, but the main focus of this research is the creation of a user-friendly and effective web andmobile application that is particularly created for distributing consumable waste foods [1].

2.2 Phone Credit for Refugees

The Phone Credit For Refugees is an organization that supports refugees by collecting donations from contributors' unused phone credits. The group has more than 64,000 mem- bers, has done over 30,000 top-ups, and has raised more than £500,000. Their influence includes refugees in the MiddleEast, Europe, Asia, and Africa. They have been effective in converting modest mobile credits into a sizable gift.[6] It is possible to manage organizational expenditures by including the concept of tiny gifts. Other organizations, such as Food Bank for NYC, which works to eradicate food poverty in NewYork City and Food for the Hungry, a faith-based organization that has been fighting hunger worldwide since 1971, are also attempting to find solutions to the issue. Similar organizations like Serve Needy, Food for Hunger, and Feed the Poor also exist throughout Asia [2].

2.3 SeVa Application

"SeVa," a food donation app that focuses on reducing food wastage by providing a platform for individuals andorganizations to donate excess food to those in need. The app features a user-friendly interface and efficient functionalities, allowing users to create profiles and specify their location and availability for food donations. SeVa connects donors with nearby recipients through geolocation, ensuring timely andefficient food distribution.[9] The paper emphasizes the app'srole in promoting sustainability and accessibility, making it easy for individuals to contribute to charitable causes by donating leftover food. By streamlining the donation process and utilizing technology, SeVa aims to bridge the gap betweenexcess food and food insecurity, providing a practical solution to address food wastage [3].

2.4 Needy Serve application

A web and mobile-based approach to address the issue of food waste by redistributing excess consumable food.[7] The approach involves the development of user-friendly applica- tions that allow individuals and organizations to easily donate leftover food. The system aims to streamline the collection anddistribution process through technology, making it efficient and accessible. The applications provide features such as a hotline number and a Facebook page for donors to arrange food collection. Overall, the approach presents a practical solution to tackle food waste by creating an efficient system for redistributing excess food to those in need [1].

2.5 Foodernity Application

"Foodernity," a mobile and web application designed for food sharing. The application aims to address food insecurity by providing a platform for individuals and organizations to share surplus food with those in need.[8] Users can register,create profiles, and specify their location and availability for food donation or receipt. The app utilizes geolocation to matchdonors with nearby recipients, facilitating efficient and timely food sharing . Foodernity promotes community engagement and social responsibility by encouraging active participationin food sharing initiatives. Overall, the application serves as a practical solution to food insecurity by leveraging technology and providing a convenient means for individuals and busi- nesses to share excess food resources with those in need [4].

2. METHODOLOGY

The Agile development method is an iterative and in- cremental approach to software development that prioritizes flexibility, collaboration, and responsiveness to change. It con-sists of several phases that are repeated in cycles throughout the development process. Here are the key phases of Agile development:

1. Requirement Identification: In this phase, the stakeholderdefines the objective and scope of the software. The key requirements and business opportunities are documented.

2. Planning or Design: The software development teamis formed, and the product owner verifies the availability of resources. Mock-ups are created, and the architecture is designed. The stakeholders are involved to gather requirementsand determine the functionality of the project.

3. Development: The development team begins working on combining the requirements and implementing them. Regular reviews and revisions are conducted to improve the software. Development involves close collaboration with clients, priori- tizing and implementing iterations, delivering regular releases,and ensuring product quality through testing.

Fig. 1. Agile Development Method

4.   Testing: Before releasing the product, the quality assur- ance team performs tests to ensure functionality and address any potential errors or bugs. User training may be conducted, and the software is released into production.

5.   Deploymentment: The software is deployed and acces- sible to customers. The development team provides ongoing support to address any issues and make improvements based on user feedback.

6.   Retirement: If the software becomes outdated or inconsis-tent with the organization, it may be retired. Users are notifiedand transferred to a new system if available, and support for the old software is discontinued.

Agile development emphasizes iterative and incrementalprogress, continuous feedback, and adaptability to change. Thestages in the Agile life cycle promote collaboration, flexibility,and the delivery of high-quality software.

3.   PROPOSED WORK

4.1 Prerequisite

This application is initially developed for Native Android users and will be extended to iOS Users in the coming future.

TECHNOLOGIES USED

- Native android
- Java
- Firebase
– Authentication (Email ID)
– One Time Password (OTP)
– Real-time Database
– Storage

4.2 System Architecture

This mobile app is a platform that connects donors, vol- unteers, and individuals in need, focusing on food donations. Here's a breakdown of the features:

- User Authentication: Donors can sign in to the app using their username and password or their Google account.

- Donor Dashboard: Once logged in, donors can view their donation history, including the number of donationsthey have made. They can also access their account information, which includes their phone number.

- Volunteer Inventory: Volunteers can browse through the available food stocks in the app's inventory page. They can select items from the inventory to distribute them to people in need or orphanages.

- Confirmation of Delivery: When a volunteer delivers the donated food, the donor receives a confirmation. This ensures that the donor knows the food has been successfully delivered.

- Photo Confirmation: After the delivery, the volunteer is required to post a picture as proof of delivery. This adds an extra layer of transparency and accountability.

- Map Functionality: The app includes a map feature that allows donors to track the volunteer's location during food delivery. Similarly, volunteers can use the map to navigate to the donor's house for food collection.

- Food Safety Check: Volunteers are responsible for check-ing whether the food is consumable. If the food passesthe safety check, the donor receives a one-time password (OTP).

OTP Verification: The volunteer must enter the OTPreceived from the donor into the app to ensure safe delivery. This step acts as a promise or confirmation fromthe volunteer.

- Emergency Contact: In case of any safety issues faced by the volunteer during their service, the app provides a means to immediately contact the police for assistance.

Overall, this mobile app aims to facilitate the donation pro- cess, enhance transparency, and ensure the safe and efficient delivery of food donations to those in need.
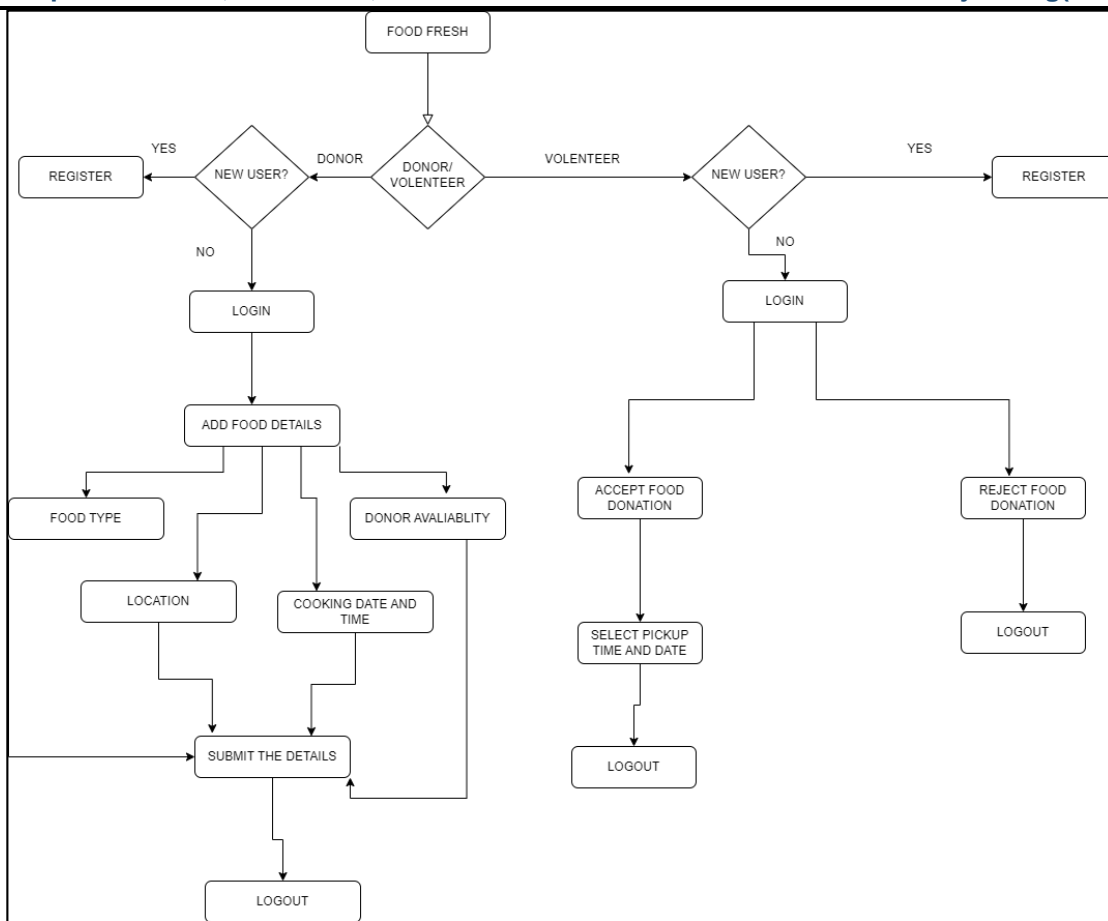
Fig. 2. System flowchart

4.3 App Implementation

4.3.1 LOGIN MODULE:

In a system where login pages are the same for both volunteers and donors, the details maintainedby the admin in the backend typically include user credentials,such as usernames and passwords. The admin is responsible for managing and maintaining the user accounts for both volunteers and donors.

Fig. 3. Food Fresh App

Fig. 4. Login

4.3.2 DONOR MODULE:

After successful login, the donor is directed to their dashboard, which serves as the main interfacefor managing their account and donations. The donation form would include fields for the donor to provide relevant infor- mation, such as their name, location, and the details of thefood they are donating. The form may also include additional fields, such as the quantity, expiration date, and any specific instructions regarding the donation. Once the donor has filled in all the required details, they would submit the donation form. The system may perform validations to ensure that all necessary information has been provided. After successfully submitting the donation, the donor would typically receivea confirmation message or notification indicating that their donation has been recorded.

Fig. 5. Volunteer form

Fig. 6. Donations

4.3.3 VOLUNTEER MODULE:

After successful authentica- tion volunteer has to check for donors then the volunteerselects a specific donor, they can access the donor's details, including the donor's name, location, and the type of food being donated. The volunteer can utilize a map feature in- tegrated into the app to navigate to the donor's house. Themap would provide directions and help the volunteer reach the location efficiently. Upon reaching the donor's house, the volunteer would inspect the condition of the donated food to ensure it is safe and suitable for consumption. If the food meetsthe required standards, the volunteer proceeds to the next step.The volunteer requests an OTP from the donor as a means of verification. The donor provides the OTP, which the volunteer.

Fig. 6. Food Map

Fig. 7. Emergency contact

5 CONCLUSION AND RECOMMENDATION

Developing a FOOD FRESH application can indeed have a significant impact in helping people in need and combating hunger. By leveraging such a mobile application, organizations can efficiently gather food donations from generous donors. This approach has the potential to attract a large number of donors, leading to a reduction in hunger and food waste.

The application allows beneficiaries to evaluate its func- tionality, ensuring that it meets their needs and offers a user- friendly experience. By involving the beneficiaries in the testing and evaluation process, the application can be refined and improved based on their feedback.

The concepts presented in this study regarding system design and architecture can be highly valuable for researchers and developers who are interested in creating similar mobile applications. They provide a foundation for understanding the key considerations and components involved in designing an effective food-sharing application.

Overall, the development of a FOOD FRESH application has the potential to make a meaningful difference in the lives of those in need. It facilitates the efficient distribution of food resources, fosters community involvement, and addresses the pressing issue of hunger in a sustainable manner.

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