

Akshaya Patra - Food Wastage Reduction Through Donation Application

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Abstract: One of the most important and fundamental basic need of human being is food. The sharp increase in the amount of wastage in terms of food makes the need for charity in terms of donation. This paper presents ‘Helping Hands’, a new internet-based application that provides a platform for donating leftover food to all needy people/organizations. Currently, in the modern market, Android and iOS is most leading and popular platform. The Android and iOS platform have different SDKs and tools for developing mobile applications. Flutter is the modern and new high-performance cross platform framework for developing mobile applications and it is developed by Google. In the developing World there is a tremendous increase in the food wastage problem and it is reaching a great height day-by-day. The important objective in today’s life is to reduce the wastage of food and making it useful for the needy people. Also, the Covid-19 situation has placed the focus on hunger for lots of people. There are many suppliers who looks for NGO through which they can donate food to the needy people but unaware of executing it. This problem can be overcome by creating a mobile application that targets food relief, in addition to addressing on hunger and poverty. The application creates a type of Helping Hand for the hunger of needy people.

Index Terms : Flutter, Cross-Platform, Software Development Kit, Android Application, IOS, Firebase, Map, Dart.

I. INTRODUCTION

Across the world, there are restaurants that waste tons of excess food every day. Where millions of people remain hungry. An important goal in our world today is to eliminate food waste by reutilizing available food sources within local communities: leftover food items in restaurants, stores and food distribution centers that may be approaching expiration; and any perishable items not used in entirety within their desired period. This is highly significant, particularly during crises such as the COVID-19 pandemic. According to the latest survey, 1.3 billion tons of food is thrown every year as waste. At the same time, 1 in every 7 people in the world go to bed hungry and more than 20,000 children under the age of 5 die daily from hunger [1]. In the current scenario, the system is running on websites which is not efficient every time, not accessible faster and also not creating any awareness. Thus, there is no proper collaboration between the supplier and the NGO. The “No Kid Hungry” mission [2] indicates that “more than 11 million children in the United States live in food insecure homes”. Children who normally rely on their school for one or two meals per day are now are facing problems related to hunger.

To overcome the problem the application for food donation acts as an interface between the users who are looking for a platform to give the excess leftover food without wasting it. It enables us to donate the food by notifying the NGO with the details of the food that is available. The required NGO claim the donation, collects the food and distribute to the needy people. This system tries to reduce the hunger and food wastage by giving waste food to NGO.

II. EXISTING AND PROPOSED SYSTEM

Existing System:

Currently, people donate stuff manually by visiting each organization number of times. In order to reduce the problems of food wastage, some websites like www.rescuingleftovercuisine.org [3] and www.annakshetra.org [4] have taken efforts to help people donate their surplus food to shelters through their official website, wherein people can donate food, donate funds and also volunteer for numerous activities. ‘Share my dabba’ is another initiative to get left over food in dabbas to hungry street children, using just a tiny sticker and the extensive dabbawala network.

Proposed System:

The proposed system aims to reduce food waste by donating it to the needy people. The role of relocating food is a massively fruitful social development that deals with food waste and the need for food. At that point, the NGO collects food from the donor via their close by specialist to the nearby shelters or poor people. After obtaining the food from the food supplier by the NGO, the NGO will donate the food to the needy people.

III. TECHNOLOGIES

Flutter:

Flutter is a free and new open-source cross platform mobile application SDK offered by Google where developers can build various Android, iOS and web applications using a common codebase. Apps that are built using Flutter are written in Dart language. Flutter uses modern reactive framework allowing developers to build awesome UI with native look and feel. Flutter framework consists of Dart, as the underlying programming language, Flutter Engine as the rendering support layer. Flutter is a popular UI framework for developing mobile applications by Google.[5]

Firestore:

Firestore provides a realtime database and backend as a service.[6] The service provides application developers an API that allows application data to be synchronized across clients and stored on Firestore's cloud. The Firestore Realtime Database is a cloud-hosted and NoSQL database that also gives you feature to store and sync data between your users in realtime. Firestore provides lot of advantages while implementing applications like Cloud Firestore.

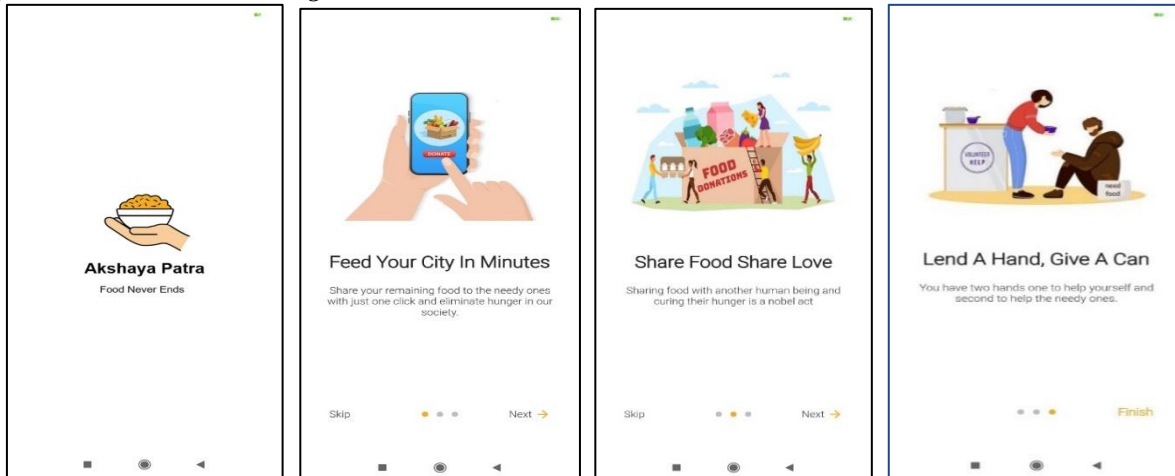
IV. APP DEVELOPMENT**Front – end development****Implementation Of Akshaya Patra****1. Splash Screen and Onboarding Screens:**

Fig: Splash screen and Onboarding Screens

Splash screen is a small interaction that a user experience at the launch of the application. Onboarding screen aims to introduce the purpose of the application.

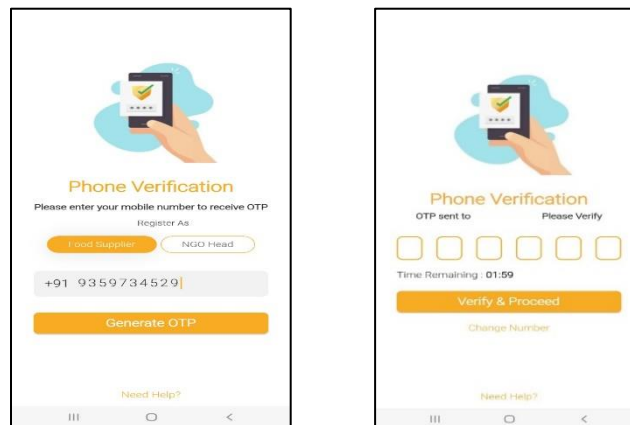
2. Phone Verification

Fig: Phone Verification Screens

On the phone verification screen, user have to select the role i.e. food supplier or NGO and has fill 10 digits mobile number. Entered mobile number should not contain any letter or other symbol, otherwise the generate OTP button will not get active. After proper filling the mobile number and selecting the role, the user will get the OTP on the number he entered. The user has to fill the OTP within time limit, if time limit ends then resend OTP button will appear. User can resend the OTP if required or change the number in case entered wrong number.

2.1 If the role is 'Food Supplier'**2.1.1 Food Supplier Registration**

Fig: Food Supplier Registration Screens

If the role selected by the user is food supplier then the user has to fill the registration form. In the registration form the user have to fill the details like name, address, city, gender, role. In the role option the user has to select either individual or restaurant owner, if the food supplier selects restaurant owner then some additional information –will be required such as restaurant name, address, license number and restaurant city. All the fields are mandatory to be filled if any of the field is incorrect or not selected then the register button will not work and shows the error message. Proper filling of all the field will let you register into the application.

2.1.2 Food Supplier Dashboard

Fig: Food Supplier Dashboard

After proper registration, the user is able to navigate to the dashboard where there are four tabs at the bottom namely donation, history, NGO's and profile. On the top there is supplier's name and a menu option that contains help from where you can get any help. There is a donate food button at the bottom from where you can fill the details of the food that you want to donate. Initially on the dashboard there is No Donation text, after filling the donation form successfully the dashboard will contain a card with the donation information and donation status as pending. The dashboard shows the pending, confirmed, successfully done and expired donation. Food supplier can edit and delete the donation until it is not accepted by any NGO.

2.1.3 Food Donation Form

Fig: Food Donation Form

If the food supplier wants to donate the food then the supplier has to fill the donation form which contains the fields such as name of the food, image, category, quantity, packaging type, food expiry, description, donation address, city and the supplier can select the desired donation location by clicking on the get my location button. The user can drag the marker to specific location of donation and confirm it. All the field are mandatory to be filled, if any of the field is left blank or unselected then the donation form will show the error message. After successful filling the form the donation is shown on the dashboard.

2.1.4 History Screen

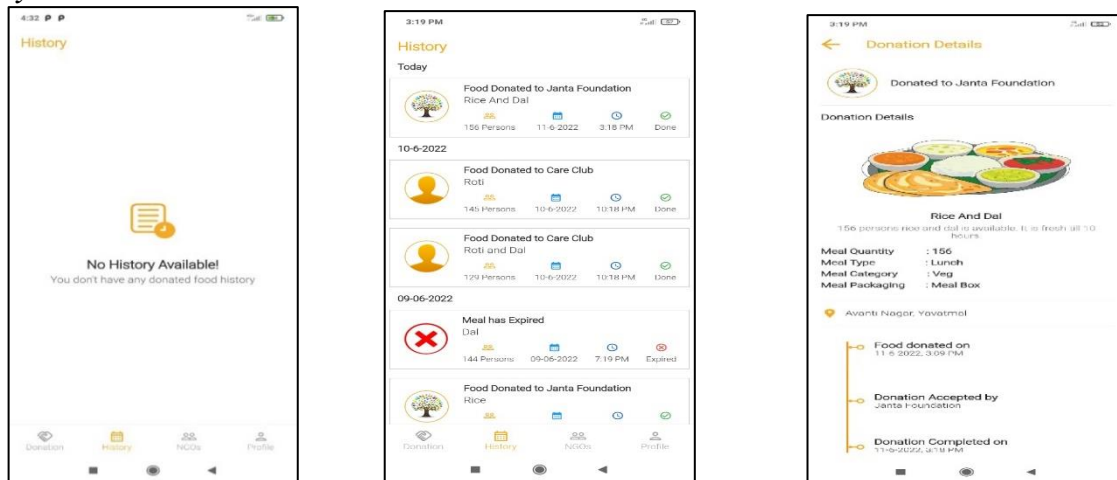


Fig : History Screens

Initially if the supplier registers on the application, then there is no donated history text. Once the donation is done successfully then it will be shown in the history tab. Also, if the donation time goes out then it will be also shown in the history tab with expired status. On tapping the particular card, the food supplier can get the details of the food that is donated to particular NGO.

2.1.5 NGO's Screen

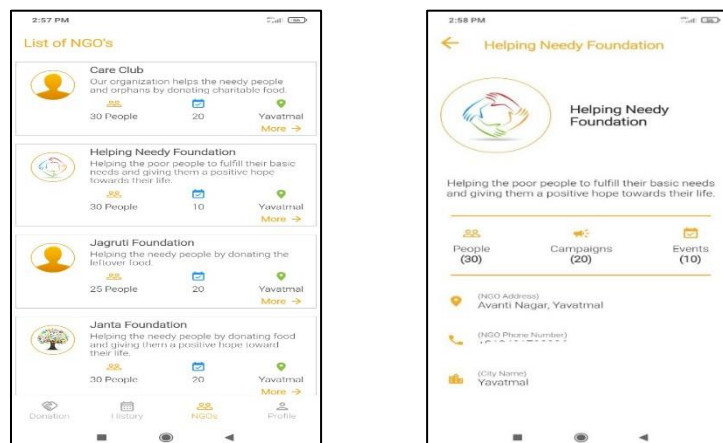


Fig: List of NGOs and NGO detailed screen

On the NGO's tab, there is list of NGOs registered in the application. On tapping the more button, the food supplier can get the details of the NGO which contains organization name, events, campaigns done by the NGO, address and phone number. Supplier can contact the NGO by tapping on the phone number.

2.1.6 Profile Screen

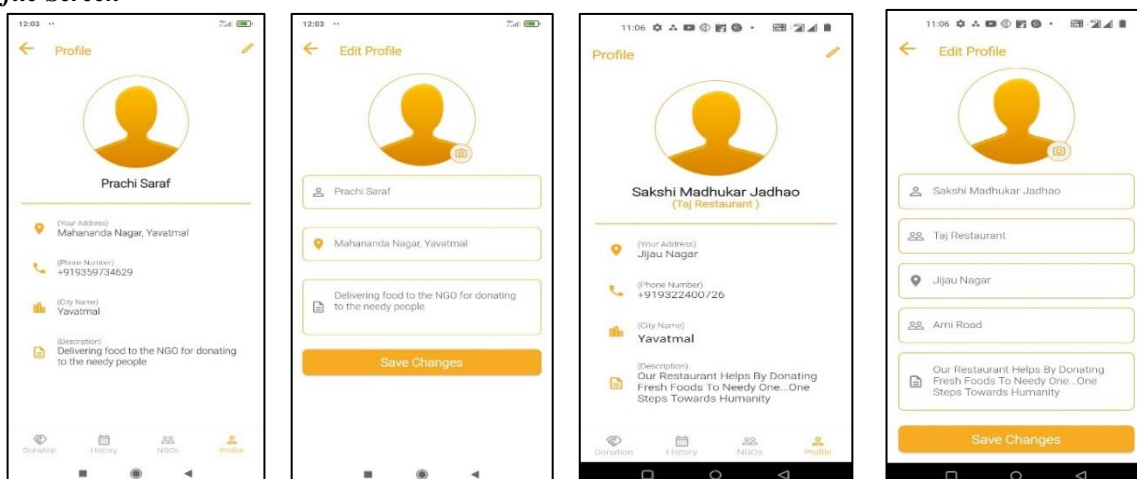


Fig: Profile Screen and Edit Profile Screen (Individual and Restaurant Owner)

Profile Screen contains the details of the registered supplier, if the food supplier is restaurant owner then some additional information is shown like restaurant name, address, city and license number. The food supplier can edit the data and save the updated data.

2.2 If the role is 'NGO Head'

2.2.1 NGO Head Registration

The left screenshot shows the 'NGO-Head Registration' form. It includes fields for: Your Information (Name, Organization Name, People in Organization, NGO Certification Number, Campaigns done, Events done), Address (Address, City), Select your gender (Male, Female), and Description (Organization Description). A 'Register' button is at the bottom. The right screenshot shows the same form with a 'Registration Failed' error message at the bottom: 'Registration Failed Please fill all the details carefully!!'.

Fig: NGO Head Registration

If the role selected by the user is NGO Head then the user has to fill the registration form. In the registration form the user has to fill the details like name, organization name, address, city, gender, NGO registration number. All the fields are mandatory to be filled if any of the field is incorrect or not selected then the register button will not work and shows the error message. Proper filling of all the field will let NGO register into the application.

2.2.2 NGO Head Dashboard

The left screenshot shows the 'No Donation Available Today!' message. The right screenshot shows a list of donations. Each donation card includes: Supplier Name (Prachi Saraf), Meal type (Roti And Dal, Dal, Rice), Meal expiry time (e.g., 5:59:43), and Status (Pending, Confirmed, Successfully Picked). Buttons for 'Get Details', 'Decline', and 'Get Location' are present. The bottom navigation bar has four tabs: Donation, History, Suppliers, and Profile.

Fig: NGO Dashboard

After proper registration, the user is able to navigate to the dashboard where there are four tabs at the bottom namely donation, history, NGO's and profile. On the top there is NGO name and a menu option that contains help from where you can get any help. Initially if no donation is available then there is No Donation Available text, and if the donations are available then it will be shown on dashboard with pending status. The available donation card contains the name of supplier, meal expiry time and donation status. If the meal expiry time runs out to zero then the card will disappear from the dashboard if the NGO doesn't confirm it and reached the food supplier. If the NGO confirms the donation then the card contains the additional options such as the NGO can decline the donation or he can get the location of the donation. Once declined the status will change to pending, and after reaching the food supplier the status will change to successfully picked. The dashboard shows the pending, confirmed, successfully done and expired donation.

2.2.3 Donation Details Screen and Google Map Screen

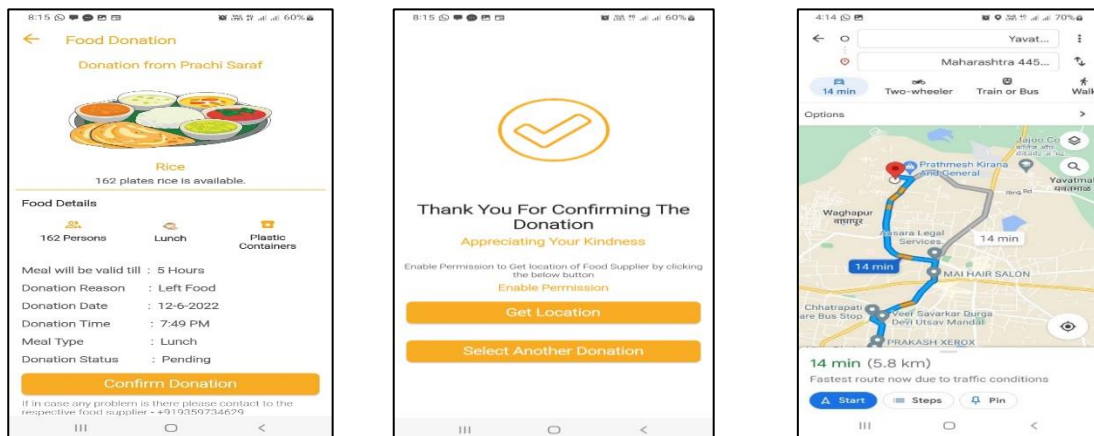


Fig: Donation Details Screen and Google Map Screen

Detail screen of donation shows the complete information of the donation such as name, category, packaging type, quantity, image, etc. In case you can contact the food supplier by clicking on the number below the 'Confirm Button'. After confirmation, the confirmation screen get loaded where there are two options i.e. 'Select Another Donation', which let you to jump on the dashboard and shows the available pending donation, so that you can confirm another donation and 'Get Location', which let you navigate to the google map and shows the route and direction of the donation from your current location.

2.2.4 History Screen

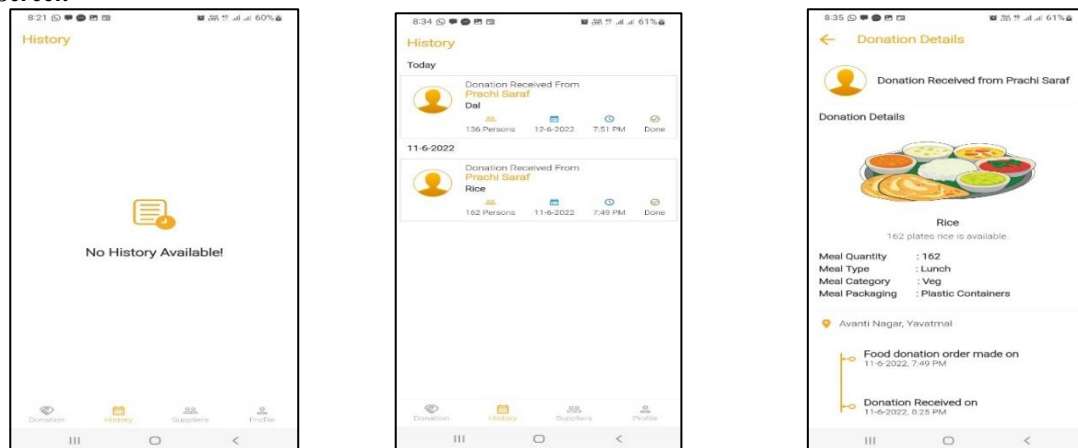


Fig: History Screens

Initially if the NGO register for the first time, then there is no history available text, once the donation is confirmed by the NGO and successfully picked from the food supplier, then it will be shown on the history tab. On tapping the particular card, the NGO will be able to see the donation details like when the donation was made, when it was completed and all the donated food details including the name of food supplier.

2.2.5 Suppliers Screen

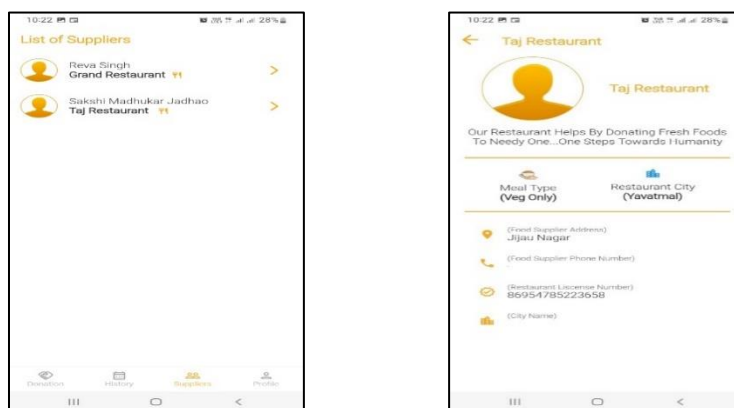


Fig: Supplier Screens

The food supplier who are restaurant owner, registered in the application are shown on the suppliers tab. The suppliers screen contains the profile picture, name and restaurant name of the food supplier. On tapping the arrow, the registered NGO will be able to see the details of the food supplier, which includes restaurant address, city, license number, phone number, etc. Tapping on phone number, NGO can contact the respective food supplier.

2.2.6 Profile Screen

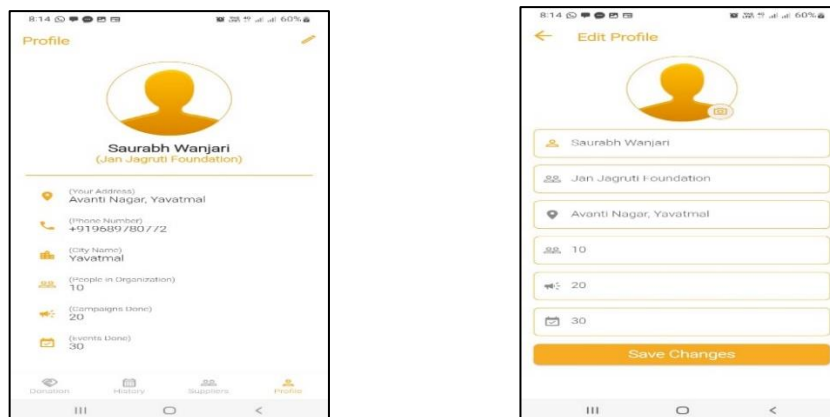


Fig: Profile Screen and Edit Profile Screen

Profile screen shows the details of the registered NGO, filled during registration. Registered NGO can edit the data and save the updated data.

Implementation of Akshaya Patra Admin

1. Splash screen, onboarding screens and Phone Verification

Splash screen, onboarding screens and phone verification screen is same as that of 'Akshay Patra' application, containing a short overview of the application.

2. Dashboard of Admin

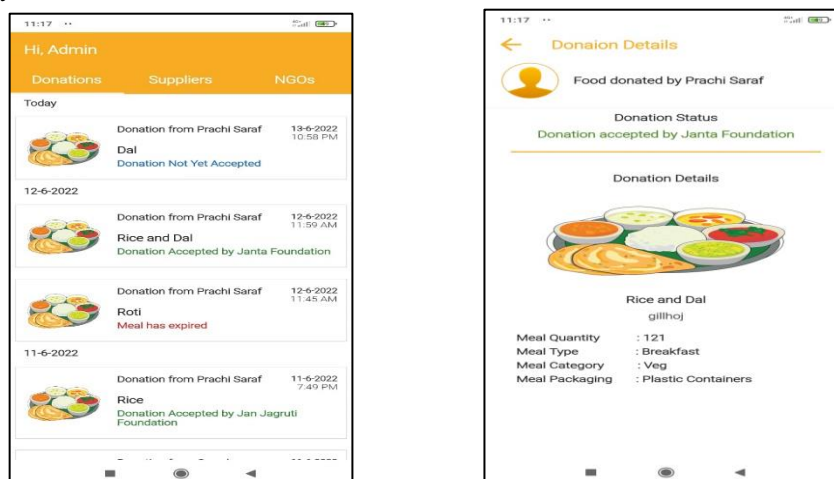


Fig: Dashboard Screen and Details Screen

Admin dashboard shows the everyday details of the donated food i.e. the food supplier name, donation details, and donation status (Not yet accepted, accepted, expired). Admin can tap on the particular card to get more details about the donation.

3. List of Suppliers

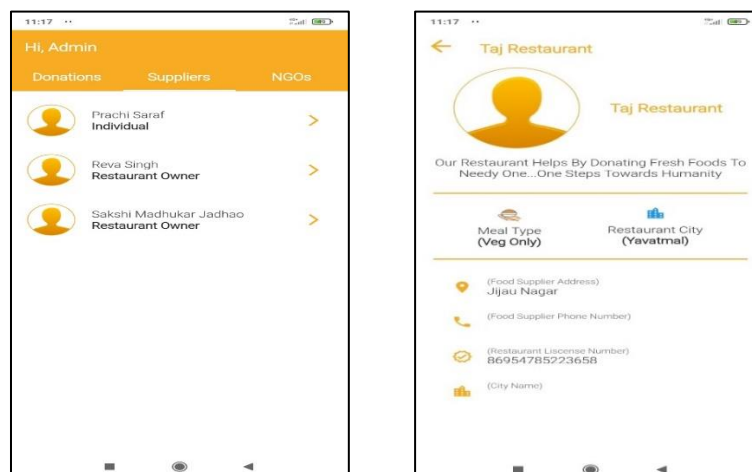


Fig: Supplier List Screen and Details Screen

Suppliers tab shows the number of registered food supplier on the application with the name and the role of the supplier (Individual or Restaurant Owner). Admin can get details of the particular food supplier.

4. List of NGOs

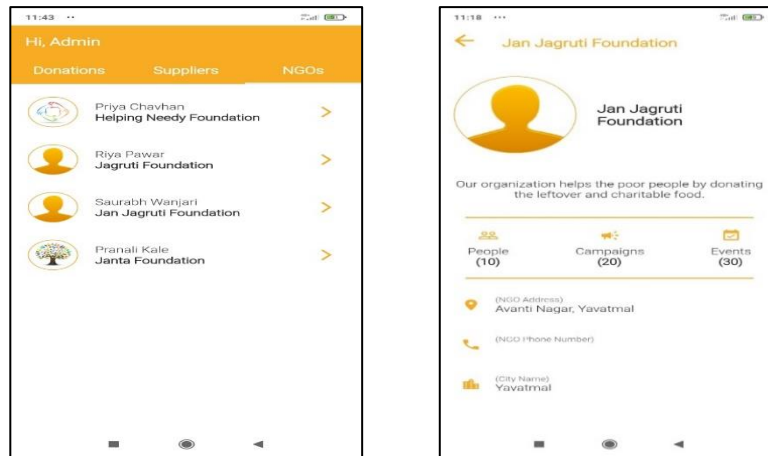


Fig: NGO List Screen and Details Screen

NGOs tab shows the number of registered NGO on the application with the name and organization name. Admin can get details of the particular NGO.

Back-end development:

1. Firebase Authentication

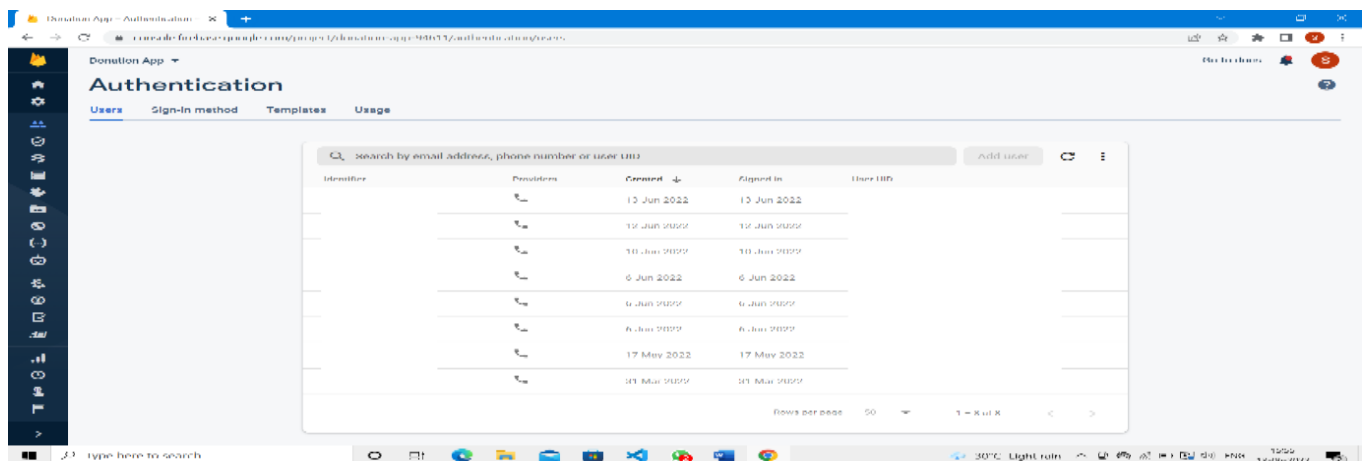


Fig: Firebase Authentication

Firebase authentication is used in order to authenticate a user, all the authentication data is stored inside authentication section of firebase. During authentication firebase provides a unique id to a particular user so that it identifies by that unique id.

2. Cloud Firestore

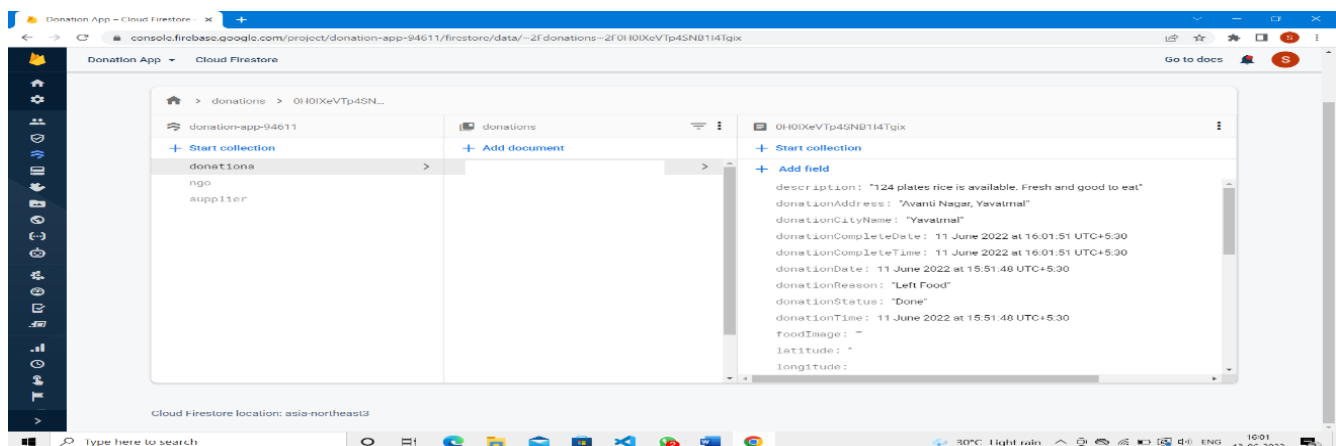


Fig: Cloud Firestore

Cloud firestore is a real time database that stores the data inside collections and documents in the key-value format. All the data of the food supplier, NGO and donation is stored inside the respective collections (supplier, ngo and donations).

2. Storage

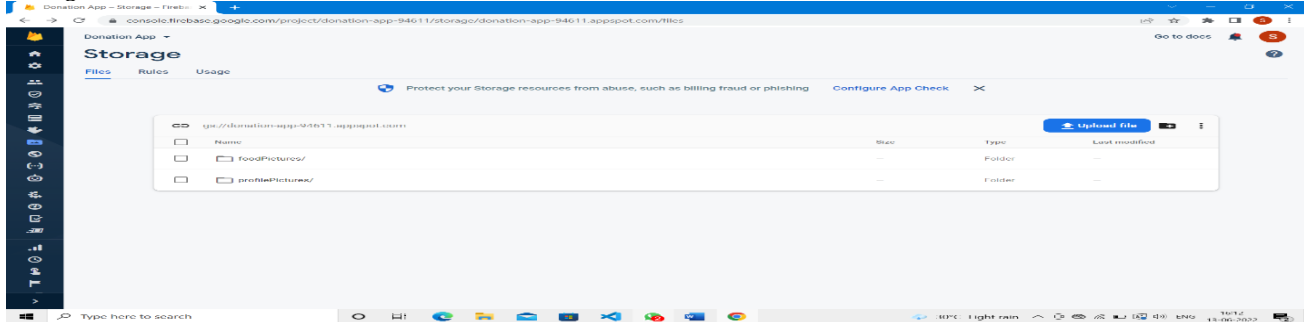


Fig. : Storage

Storage let you store the contents such as images, videos. The profile pictures of food supplier and NGO is stored inside the profilePicture folder and the images of the donated food is stored inside the foodPictures folder.

V. FUTURE SCOPE

1. You can expand it on iOS platform.
2. You can arrange campaigns to increase awareness against food wastage and inspire people to save food from being wasted.

VI. CONCLUSION

Billions and tones of leftover food is wasted every year. Donating the leftover food to the needy people is one of the best approaches to manage the leftover waste food. Instead of throwing the it as a trash, we can make it being useful for the needy people. So, the proposed application shall reduce the wastage of food and at the same time it helps in reducing hunger of the needy people.

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