FOOD WASTAGE REDUCTION UTILIZING AN ANDROID APPLICATION

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Master of Science in Computer Science and Engineering

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APPROVAL

This Project/Thesis titled **"FOOD WASTAGE REDUCTION UTILIZING AN ANDROID APPLICATION"**, submitted by **Pappu Hosen,** ID No: 212-25-019 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of M.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 21-09-2022.

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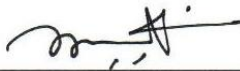Daffodil International University

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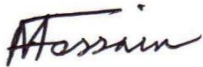
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DECLARATION

Hereby declare that this research thesis is prepared by me, **Pappu Hosen** to the department of Computer Science and Engineering, Daffodil International University. Under the supervision of **Professor Dr. Md. Fokhray Hossain,** Daffodil International University.

We also declare that neither this Thesis nor any part of this thesis has been submitted elsewhere for the award of any degree.

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ABSTRACT

This project is on food wastage reduction through donation. A huge number of world's produced food get wasted everyday however there are one person in every seven remains hungry.so we have built an application to reduce the wastage of food. Restaurants or other users can donate surplus food by using our application. Authorized organization can collect the food through this application and distribute them to hunger people. There are some charity organizations who are doing voluntary work to take the wasted food from restaurants & distribute it to the hunger people manually. This application will make their work easier than before and inspire more organization to do this noble work. Our project will create a digital link between charity organization and restaurants or other users to reduce food wastage and can make a huge difference.

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CHAPTER 1
INTRODUCTION

This chapter will begin with an overview of our project before going on to the purpose, problem description, anticipated outcomes, and report format.

1.1 INTRODUCTION

- Every day, a large amount of food is wasted at restaurants all around the world. Where there are limitless numbers of hungry individuals. One of the world's most crowded and thickly possessed countries is Bangladesh.
- The country, which is experiencing a severe food scarcity, sees a lot of food wasted by both individuals and businesses.
- Individual contributors can also donate outdated food using our application. Remaining food from restaurants or individual customers may be given to registered charitable groups for pickup.
- Following that, volunteers from the organization will provide meals to individuals in need.
- We will also create a "goodwill" points system to recognize restaurants for their good activities and to motivate them to run ethically as social companies.

1.2 PROBLEM STATEMENT

As this project moved through its many phases, we ran into a few obstacles. The challenges we ran into were,

- Collect this information from several restaurants.
- Discover how much food each restaurant throws away. An average of 25 to 40 kg of food is frequently wasted in restaurants.
- Over 40 to 50 tons of food are lost each day in the city of Dhaka.
- Taking good care of the food to prevent wastage is a major issue for us.
- The meal is properly and fully digested for those who live in poverty.

1.3 OBJECTIVES

1. The project's primary goal is to eliminate food waste through charitable giving [24[.
2. In order to collect and distribute food waste, it is necessary to develop digital connection between restaurants and charitable groups.
3. to achieve a balance between food shortage and plenty.
4. to provide food for the hungry.
5. to facilitate the charitable groups' volunteer activity in collecting and distributing food waste.

1.4 RESEARCH METHODOLOGY

We discuss food waste with the majority of Data City's eateries and ask them to donate any leftovers to us.

- The prompt delivery of perishable and prepared food to hungry people in their neighborhoods by restaurants, caterers, business dining facilities, hotels, and other food enterprises. Knowing that many food banks and rescue organizations will pick up donated food for free allows donors to save time and money.

- Consists of collecting surplus food from donors and/or distributing donated food to beneficiaries directly, as well as to other organizations that provide recipients with food. These organizations may also offer extra programming, such meals or other foods created from donated food or instruction and skill-building, and many of them employ software.

- We have built an android based mobile application. It is very easy to establish link between restaurants or individual users and charity organization through mobile application. In Bangladesh, the total number of Mobile Phone subscriptions has reached 147 million at the end of January 2018 [1].

- Alternatives, such apps, to plan the distribution of additional food by volunteers or other groups.

- Set up a schedule for gathering food donations from our organization or group every week, every two months, or every four months.

- We will then accurately distribute the meals among the restaurant clients.

1.5 PROPOSED SOLUTION

- We visit maximum restaurants in dhaka city and talk to them about how much food they waste and talk to them about giving the food to us.

- The quick conveyance of short-lived and arranged food varieties to hungry people in their networks by eateries, caterers, corporate lounge areas, lodgings, and other food organizations. Givers can set aside time and cash by giving food realizing that numerous food banks and salvage gatherings will get it for nothing.

- Incorporates getting additional food from contributors or potentially conveying gave food to beneficiaries straightforwardly, as well as to different associations that disseminate food to beneficiaries. These associations may likewise give extra programming, like instruction and expertise advancement, the arrangement of dinners or other food items from gave food, and so forth. A considerable lot of them use programming instruments, for example, applications, to sort out the dispersion of additional food by volunteers or different associations.

- Create a schedule to collect donated food from our organization or business on a weekly, fortnightly or monthly basis.

- Then we will distribute the food among the food consumers properly.

1.6 RESEARCH OUTCOME

Our objective is to develop an Android app that will reduce food waste by encouraging donations. Users may submit information regarding the availability of food, both personally and professionally. Users that want to deliver meals are not required to sign up with us. The information on food availability will only be accessible to registered charitable organizations. The collecting and distribution of the meals to people in need will fall within their purview.

1.7 CONCLUSION

In the end, ineffective monitoring and assessment, poor administration, weak policies, defective designs, and a lack of political will are what are impeding attempts to eradicate hunger. There is a need for action on each of these fronts. Economic development won't be enough to significantly reduce the incidence of childhood undernourishment or increase food intake among the poor [9]. In this regard, it is highly unlikely that India would attain the MDGs without making substantial policy changes and improving the effectiveness of their implementation [14]. By using this program, it is really simple to satisfy the hunger of those who are in need at various locations and avoid the issue of ineffectively throwing away leftover food at parties, weddings, and other events. Add more of them. Any user who wishes to publish information about the availability of food must do so with an accompanying photograph and details about the product, such as its quantity and expiration date. He can decide the time of pickup as well. Groups that have registered will see posts on food availability in their newsfeed. Organizations can collect the food and distribute it to the hungry in line with the pick-up time and location indicated by the food donor. The organization is required to post a photo and details of the distribution after the food has been distributed. Everyone will be able to see the posts on their newsfeed. A restaurant receives "goodwill" points for donating a meal. There will also be a ranking of the charity that have received the most gifts and meals.

CHAPTER 2
LITERATURE REVIEW

The waste statistics we have read about in this chapter will be reviewed, and then some examples of relevant research will be provided. We additionally discuss the troubles and how to settle them.

2.1 INTRODUCTION

Food that is wholesome and safe for human eating may be discarded or used in various ways along the whole food supply chain, from initial manufacture through final consumption at home.

A third of all food produced for human use globally is lost or squandered. Every year, 1.3 billion tons of food are wasted. Food loss and waste amount to around US$680 billion in wealthy countries and US$310 billion in poor countries. Only the US and Europe waste food that could feed everyone on the planet three times more. At the same time, 1 in 7 people in the globe go to bed hungry, and more than 20,000 children under the age of five die of famine every day [2].

According to a 2016 study carried out by the Bangladesh Institute of Development Studies in collaboration with Right to Food, Bangladesh [3], around 5.5% of the food purchased in Bangladesh is wasted. Therefore, preventing food from going to waste might have a significant impact on a nation that faces persistent famine.

map for those who want to make a direct donation. The app makes requests for food to be prepared in no more than two hours.
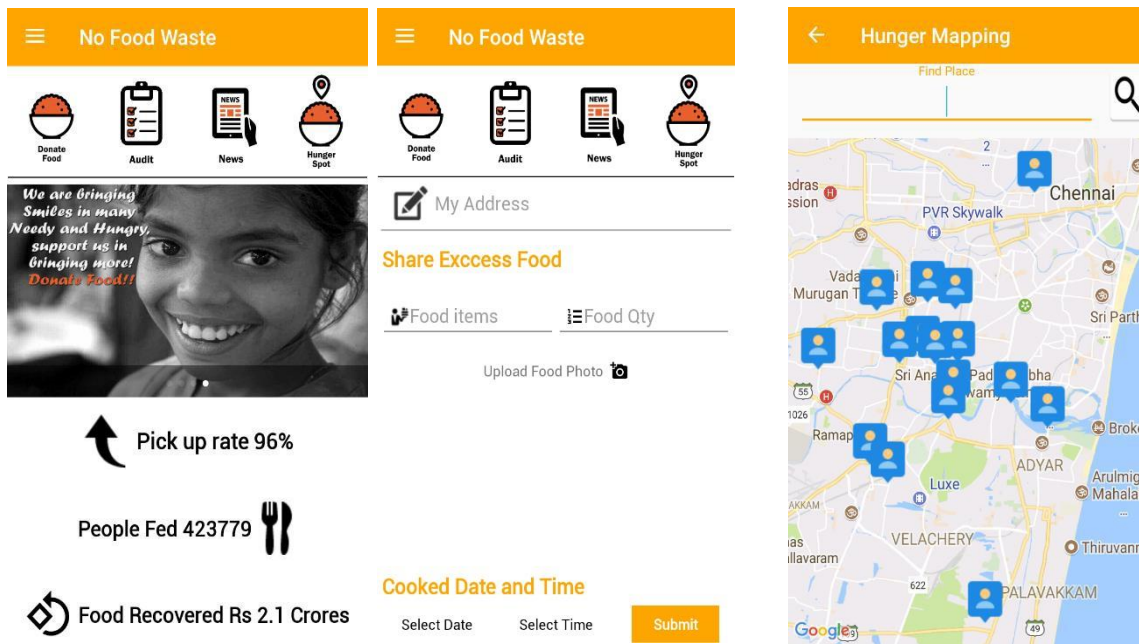
Fig. 2.1: User Interface of No Food Waste Application

In order to prevent good food from going to waste, the free OLIO app connects local businesses, restaurants, and neighbors. This allows for the sharing of leftovers rather than their disposal. Simply take a picture of your leftover food and submit it to OLIO, where your neighbors will receive customized alerts and may make any requests they like. Pickup takes place at the house or shop, an OLIO Drop Box, or another predetermined location. Since OLIO's UK-wide debut in January of this year, over 100,000 individuals have signed up, and they've exchanged 150,000 pieces of food, which is the equivalent of 30 tons or 70,000 dinners!

OLIO allows users to resell or give away unwanted items, highlight the value in goods that people might otherwise throw away. Foodbank [4]

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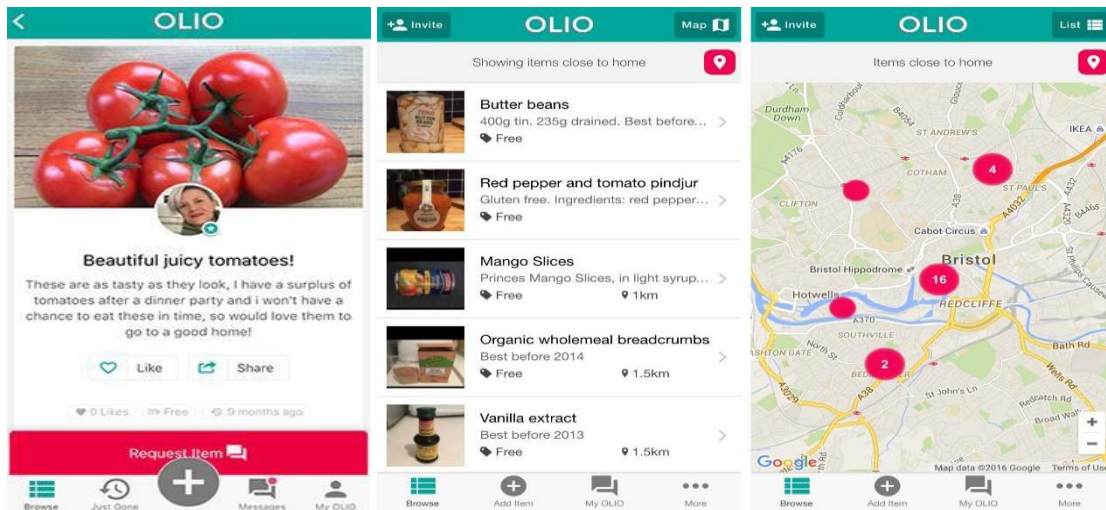
Fig. 2.2: User Interface of OLIO Application

The foodbank is an Australian charity's pantry. They solicit donations of food and grocery products from farmers, retailers, and the general public before distributing them to Australia's devoted nonprofits and neighborhood groups. More than 2,600 organizations and 1,750 schools get 63 million meals each year from Foodbank, the largest hunger relief charity in Australia.

Foodbank has collaborated with the entire Australian food and grocery industry, including farmers, distributors, manufacturers, and retailers. Donations may be made for goods that are excess, out-of-date, or not up to standards [15]. As part of their commitment to social responsibility or as part of a cause-related marketing push, corporations also donate. In addition, Foodbank collaborates with producers, retailers, and transporters through programs like the Collaborative Supply program to get necessary staple goods.

Fig. 2.2: User Interface of Foodbank Website
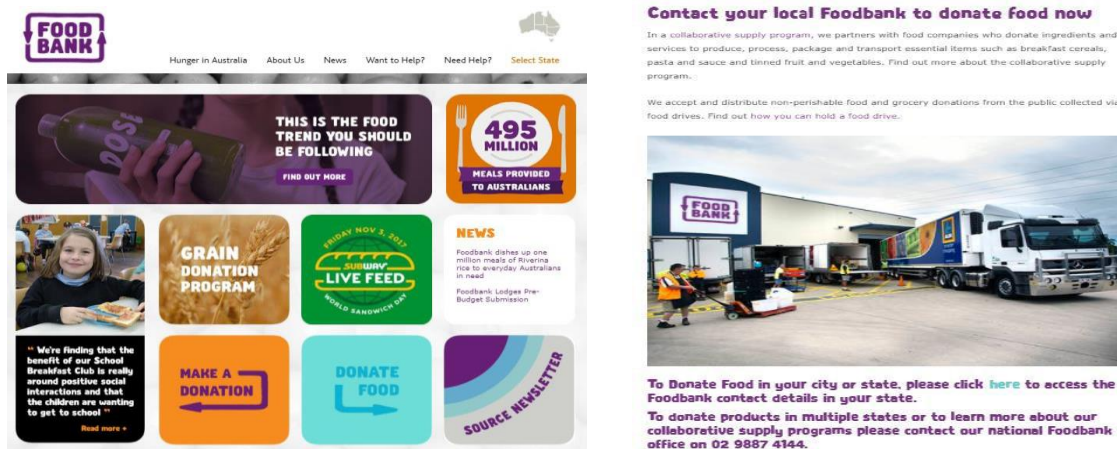
2.2 COMPARATIVE STUDY

We have examined a number of programs and websites with regard to the concept of avoiding food waste. The bulk of them are designed for people who live in Australia, South Africa, the USA, the UK, and India. Unfortunately, despite the fact that 5.5% of the food purchased by Bangladesh is wasted [3], our country lacks a similar program. We tried to focus on Bangladeshi perspectives as a consequence. To feed the hungry, volunteers from "No Food Waste" collect and distribute food that has been wasted. But our main objective is to link charitable organizations with food givers. Volunteers from charity groups will use our application to collect food to donate to the poor. Before it is wasted, "OLIO" is used to collect delectable food from nearby residents or establishments. To avoid food waste and to distribute extra food. There are no participating nonprofits. Residents in the famine zone do not receive food, therefore only their neighbors benefit from this scheme [26]. The food that "Foodbank" acquires from producers, distributors, or the general public, on the other hand, can be used by Australia's devoted charities and community groups. Food must be transported to the appropriate areas before it can be distributed. However, anyone may use our platform to share the extra food from restaurants or households. A benevolent organization will collect food at their entryway [25].

2.3 SCOPE OF THE PROBLEM

This application offers a few unique features that set it apart from other projects and help to address issues. Some unique characteristics of our application include:

- Verified charity organization.
- Phone number verification.
- Easy to get register as restaurant, individual user or charity organization.
- Established a link between food donor & charity organization.
- Easy to make a food availability post.
- Easy to confirm food pick-up request.
- Navigate pick-up location from current location.
- User friendly UI design.
- Fast loading and high performance.

2.4 CHALLENGES

We encountered a few difficulties as this project progressed through its various stages. Those difficulties were satisfactorily met by us. The difficulties we ran into were

➢ Building real-time databases has proven to be challenging for us. This challenge has been addressed with the aid of Google Firebase.

➢ It was challenging for us to develop and construct an interactive, user-friendly user interface using XML.

➢ Additionally, it was difficult to have the restaurant take advantage of the effort. If the application doesn't help them, they won't want to use it. We established a "goodwill" point system to solve this problem.

➢ The analysis of requirements, timelines, the quality of the code, performance, and system effectiveness were other often occurring problems.

2.5 CONCLUSION

The main objectives of the proposed application was to make reduction in food wastage as much as we can, and to feed those people who do not have enough food for one time to feed themselves. It's a big hassle hard for them to search food every day to feed themselves as well as their families, and also for donors to reach out to them. This application comprises of three modules: admin, user, and rider [13].

CHAPTER 3

REQUIREMENTS ANALYSIS

We will go through every prerequisite that will be necessary to finish the suggested system in this chapter. Diagram and explanation of the use case are included, and this chapter also lists other criteria.

3.1 INTRODUCTION

 Numerous people need to contribute their assets to good cause that help poor people. Furthermore, a great deal of gatherings need to request gifts of the numerous things they need, like dress, food, writing, and so forth, however they can't do as such because of an absence of subsidizing. Due to that, we developed an android application "Make You Smile" using android studio because it will reach a wider range of audience since most people these days use android phones. Through that application people can donate things according to their capacity.

3.2 MODEL FOR BUSINESS OPERATIONS

Business strategy modeling (BPM) combines system engineering with business process management inside a company or organization. It defines the analytical portrayal of any business or institution. Both company quality and costs are lowered as a result. The modeling of business processes may be altered or enhanced to create new commercial possibilities.

Model of Business Process for Restaurant's Signup:-
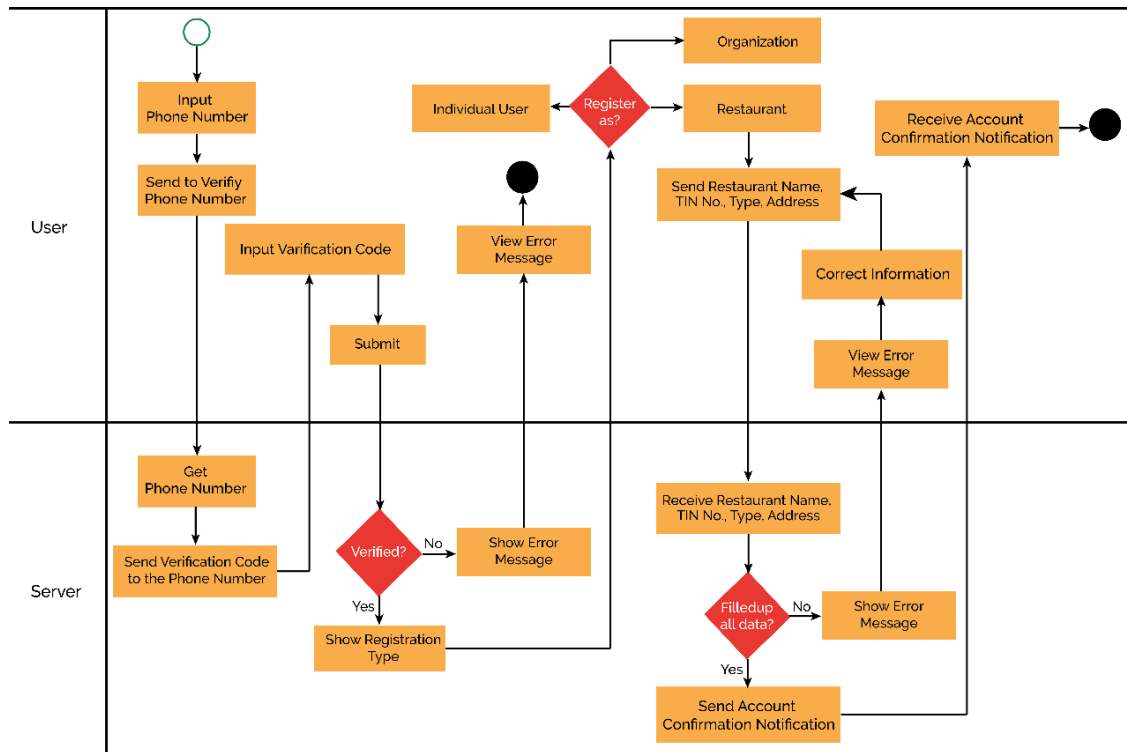
Fig. 3.1: Model of Business Process for Restaurant's Signup

Model of Business Process for Individual User's Signup:-

Fig. 3.2: Model of Business Process for Individual User's Signup
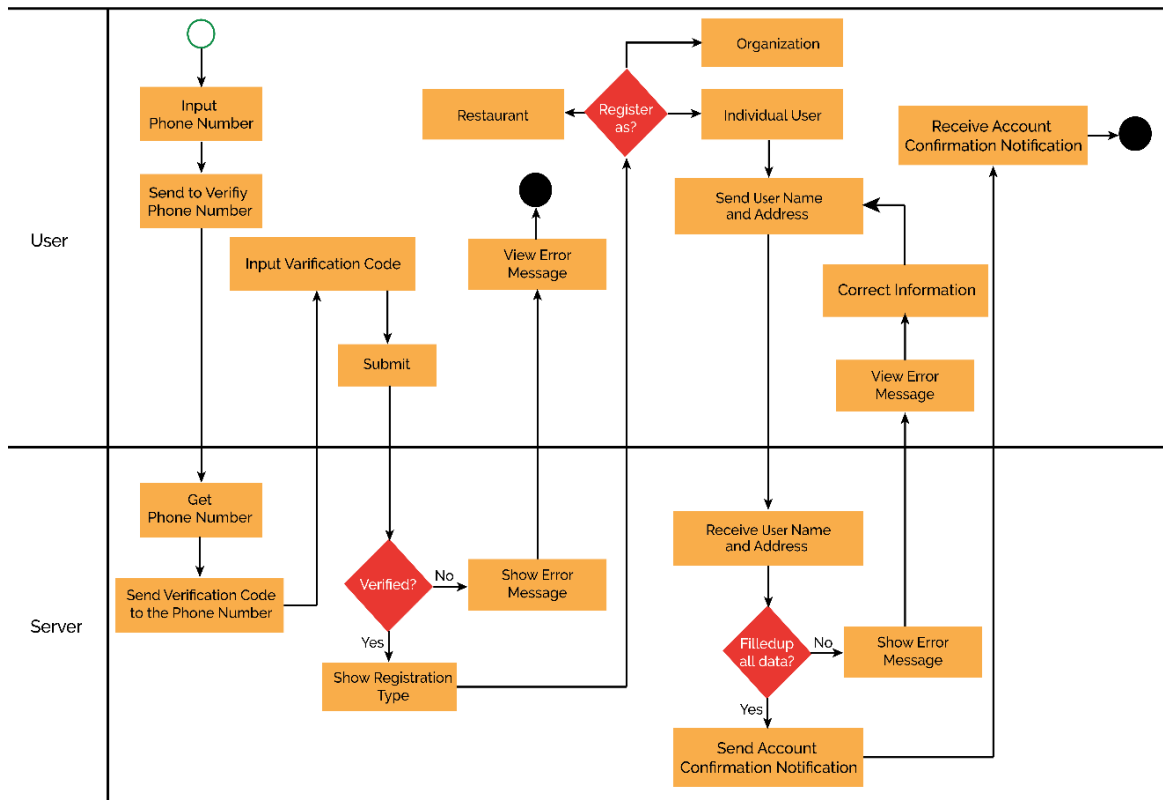
Model of Business Process for Organization's Signup:-
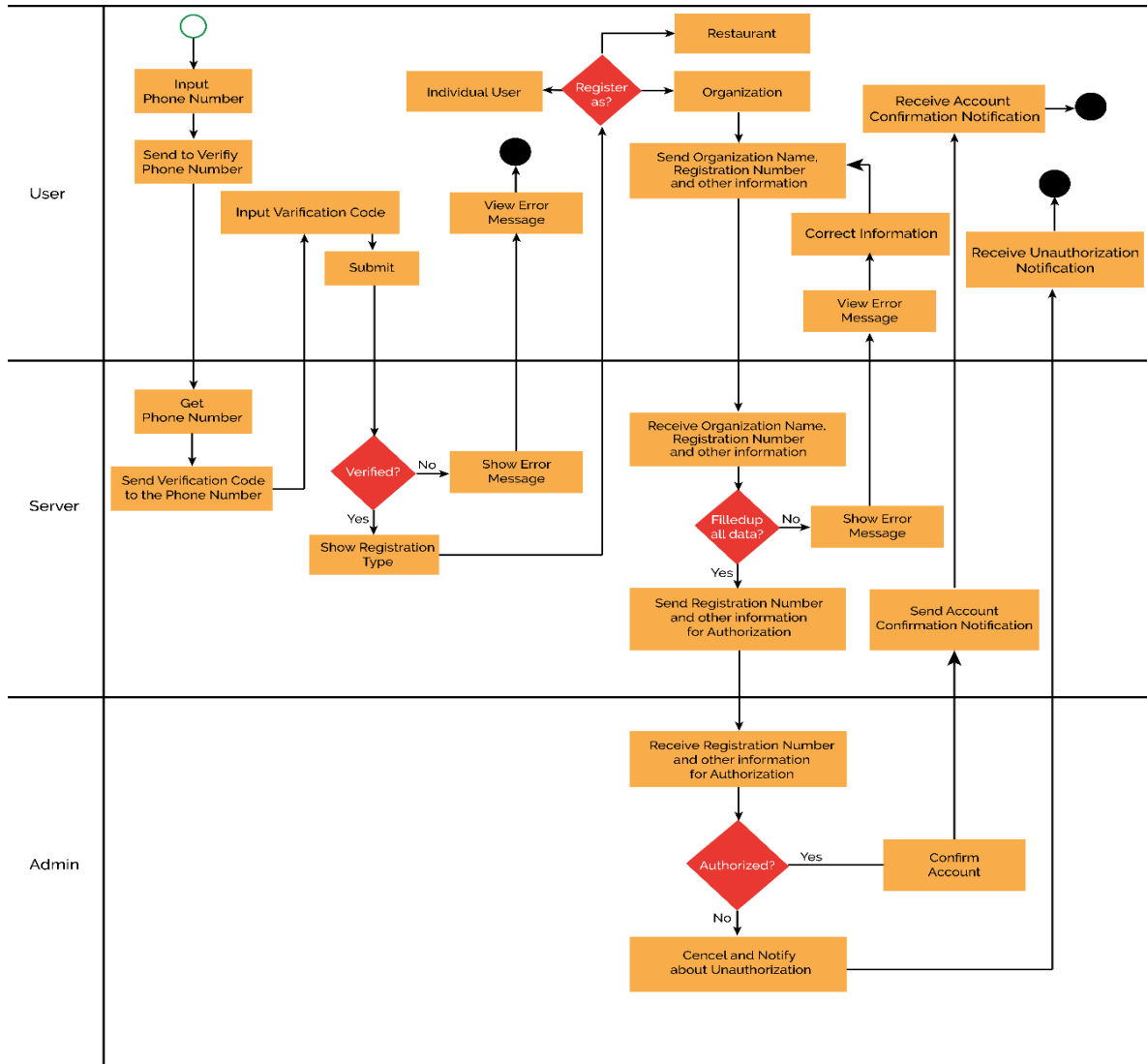
Fig. 3.3: Model of Business Process for Organization's Signup

Model of Business Process for Login:-
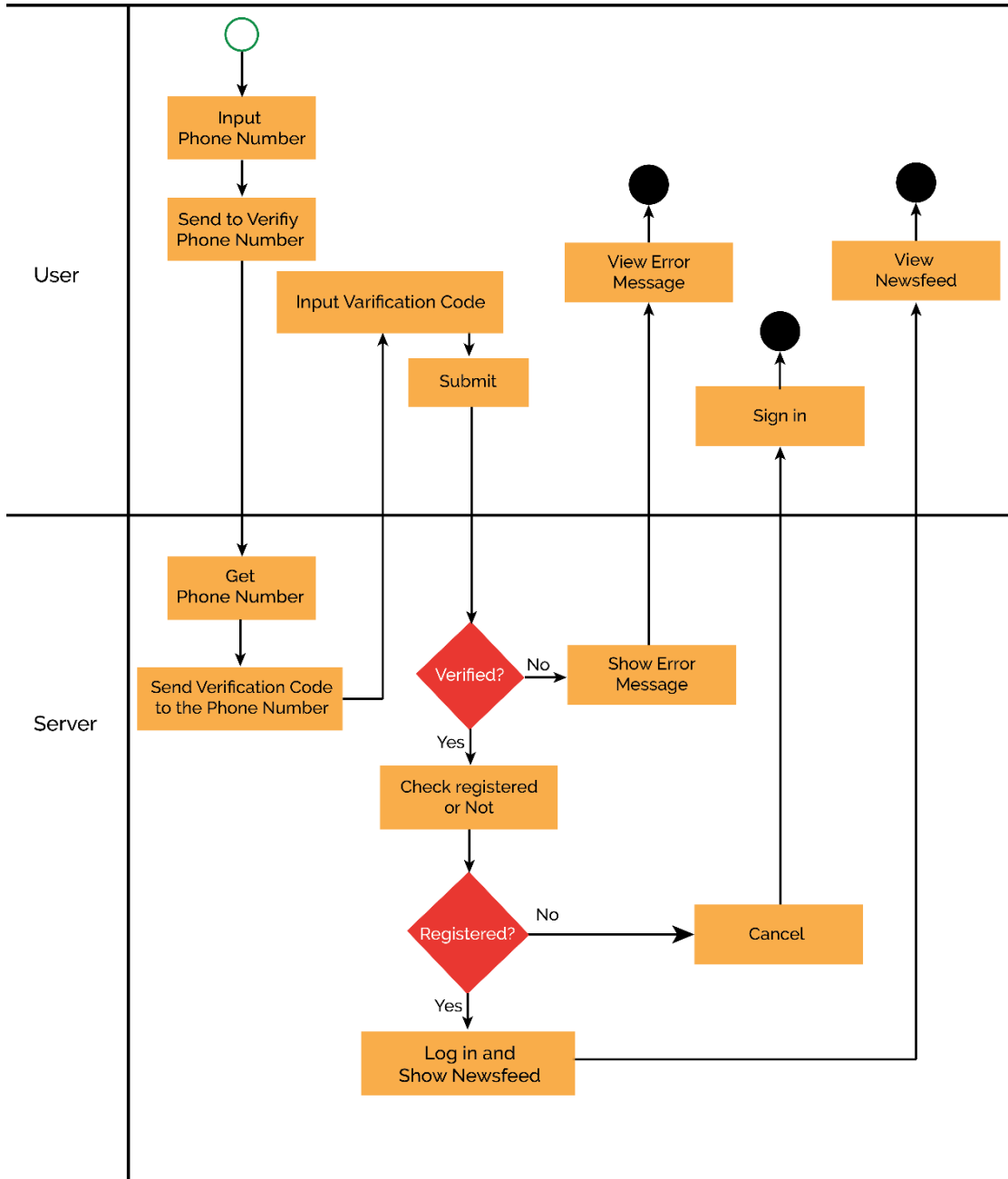
Fig. 3.4: Model of Business Process for Login

Model of Business process for Make Food Availability Post:-
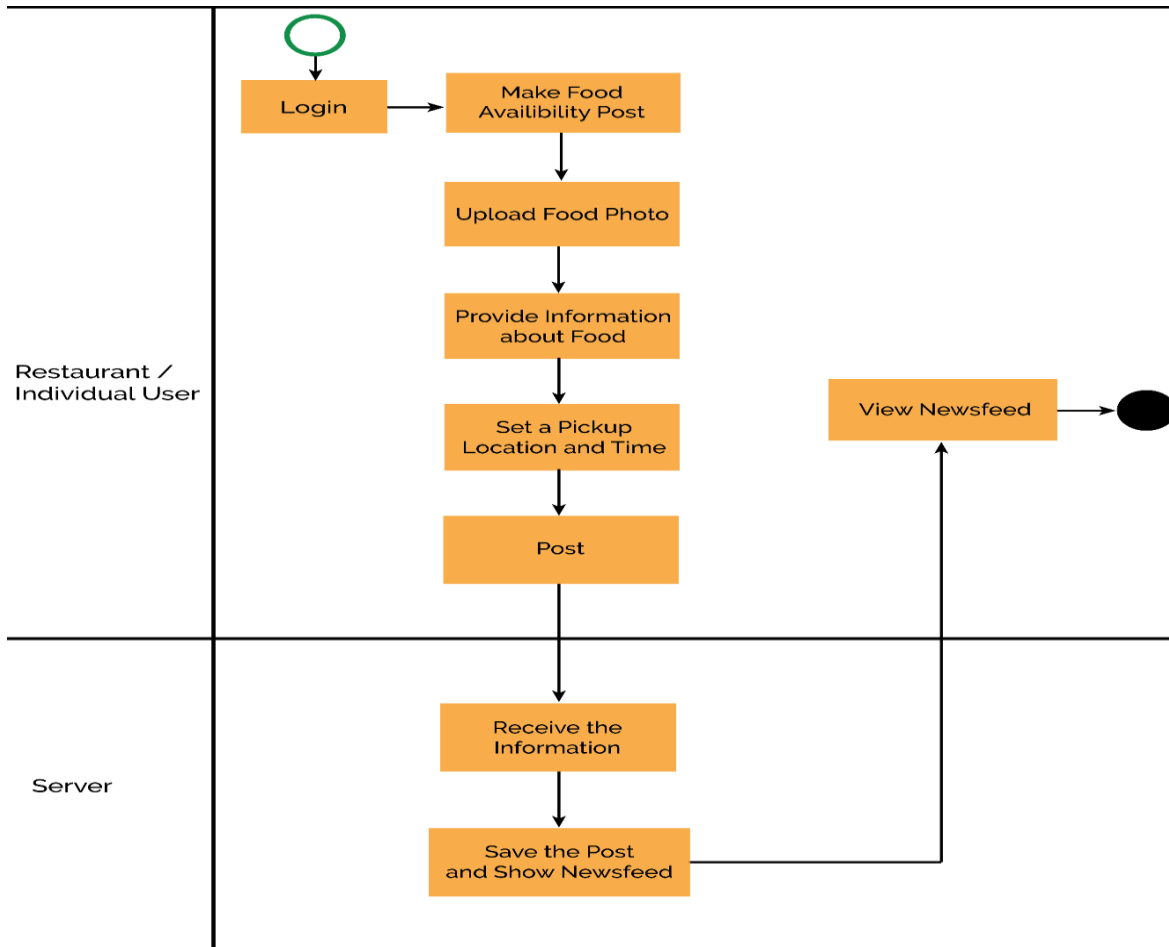
Fig. 3.5: Model of Business process for Make Food Availability Post

Model of Business Process for Food Pick-up Request & Confirmation:
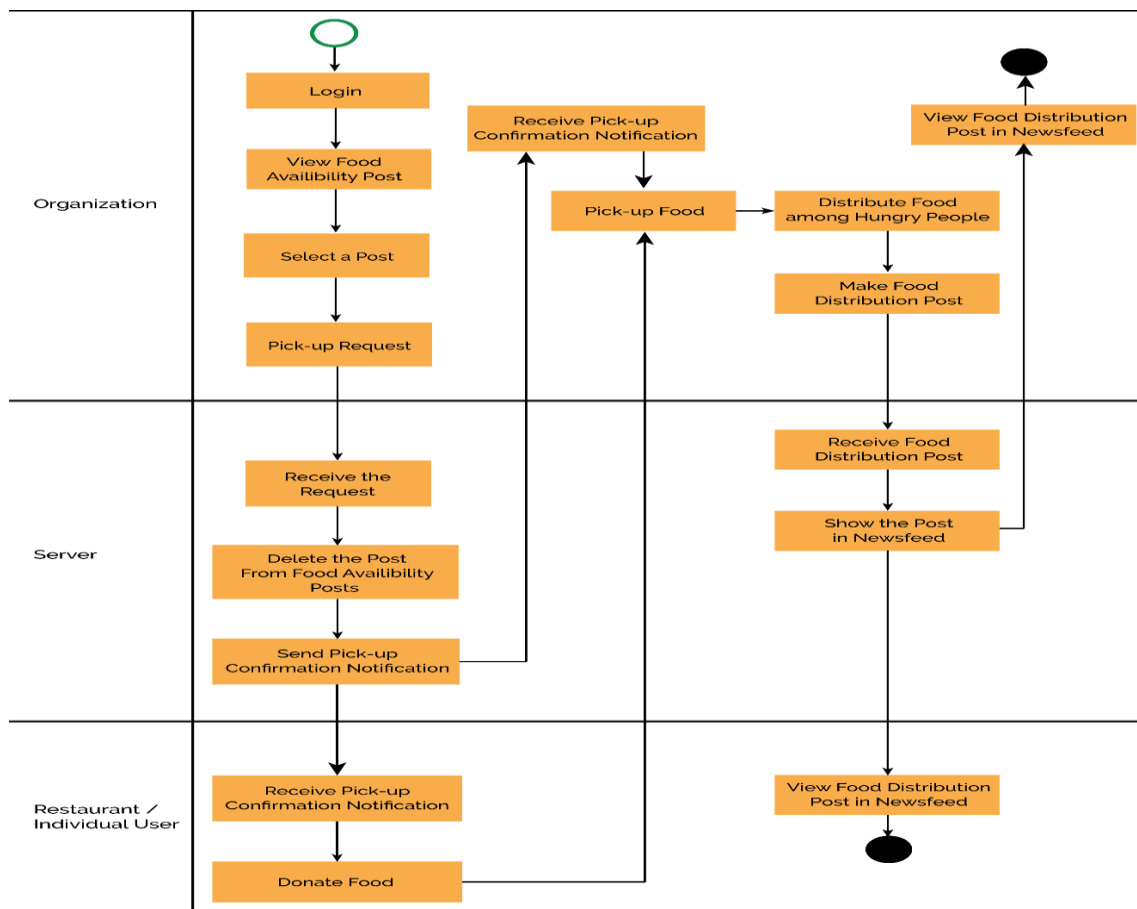
Fig. 3.6: Model of Business Process for Food Pick-up and Distribution

3.3 DESCRIPTION OF THE PROCESS MODEL:

Restaurant chains, charitable organizations, and private users must register by supplying the essential data. Only charitable organizations require admin approval. If they are registered, every user may quickly log in using mobile number verification.

Restaurants, individual individuals, and organizations can read the newsfeed after logging in. In the newsfeed are the most recent gift and food served. They must post a photo, describe the cuisine in detail, and specify a time and place for pick-up if they wish to exchange meals. Then they may create a post on food availability.

The most recent posts about food availability are only visible to organizations. They must select the "Pick-up" option if they wish to pick up the meal. In order to prevent other organizations from requesting to pick up the same food, the server will immediately send pick-up confirmation notifications to both organizations and

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donors and erase the post from the food availability post. After receiving a pick-up confirmation message, the organization may pick up the meal at the restaurant's designated pick-up time and place. After feeding the hungry, the group is required to post a photo and information on the food delivery. This article will show up on everyone's newsfeed.

A "good will" point will be awarded to the restaurant for providing the dinner. There will be a ranking list for the group that donated the most meals and provided the most meals each month.

3.4 CASE MODEL USE

A use case diagram displays all of a system's activity flows as well as its major and secondary users. Whereas secondary users are inventions based on technology and main users are often human users.

Separate use case models are included here for restaurants, individual users, and organizations.

Use case Diagram for Restaurant :-
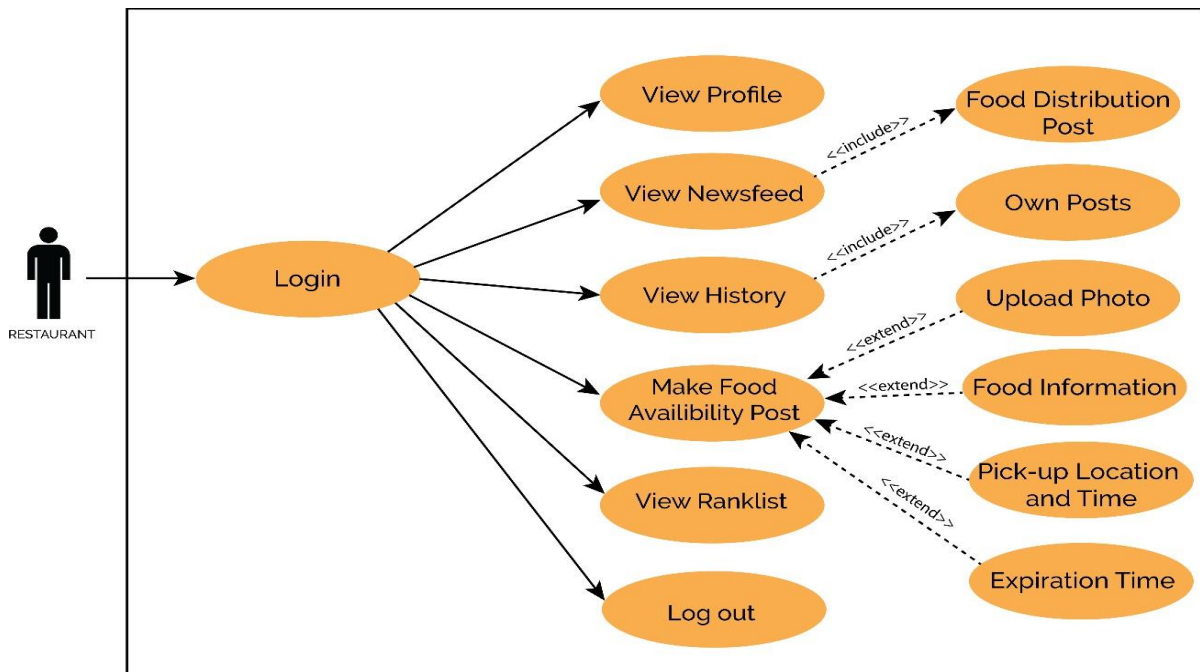
Fig. 3.7 Use case Diagram for Restaurant

Use case Diagram for Individual User:
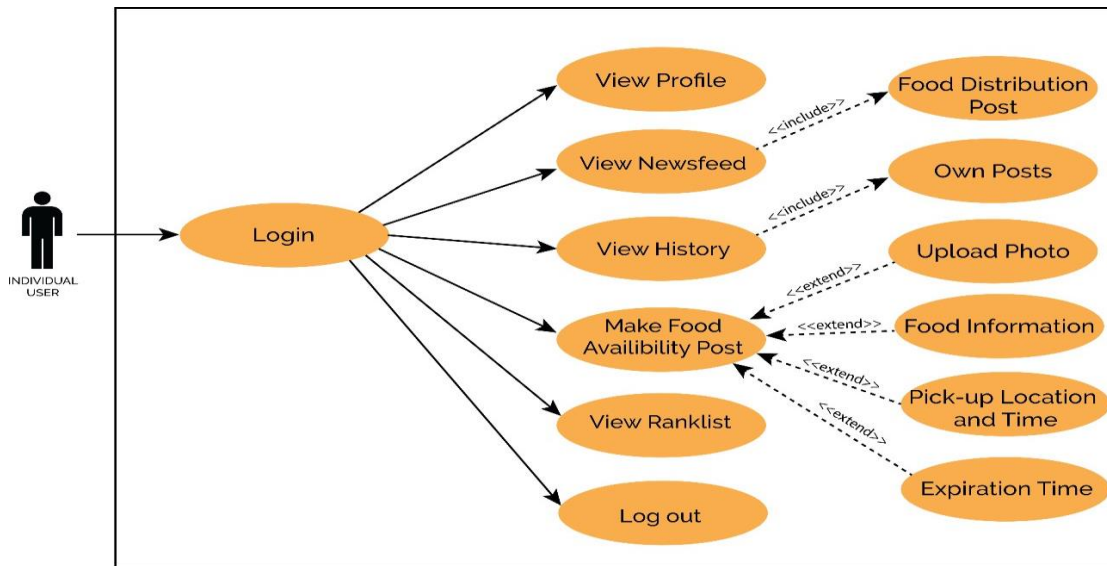
Fig. 3.8 Use case Diagram for Individual User

3.5 DESCRIPTION OF USE CASE

Use case diagram activities are described in detail in use care descriptions. The use case description explains the prerequisites and outcomes of an action, Use case summaries for our project are included below.

Table 3.1: Description of Use Case for Login

Use case	Login
Primary Actor	Restaurant, Individual user, Charity organization
Secondary Actor	Server
Actor's Goal	To get to the application, sign in
Pre-condition	Provide enlisted phone number for verification.
Post condition	View newsfeed

Table 3.2: Description of Use Case for View Newsfeed

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Use case	View Newsfeed
Primary Actor	Restaurant, Individual user, Charity organization
Secondary Actor	None
Actor's Goal	To view the newsfeed
Pre-condition	Sign in to the program.
Post condition	Restaurant and individual user can make food availability post and organization can make food distribution post.

Table 3.3: Description of Use Case for Make Food Availability Post

Use case	Make a food accessibility declaration.
Primary Actor	Restaurant, Individual user
Secondary Actor	Server
Actor's Goal	To make a food availability post
Pre-condition	Sign in to the program, present a photo, and give insights regarding the dinner, including the get general setting.
Post condition	View owns the post in history

Table 3.4: Description of Use Case for View Food Availability Post

Use case	View food availability post
Primary Actor	Organization
Secondary Actor	Server
Actor's Goal	To view the food availability posts
Use case Pre-condition	Make pick-up request Login as a registered organization
Primary Actor Post condition	Organization Can make a pick-up request
Secondary Actor	Server
Actor's Goal	To make a request to pick-up the food

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Pre-condition	Select a post from food availability posts and click on 'Pick-up' button
Post condition	Server will send confirmation notification to both food donor and Organization and delete the food availability post.

Table 3.5: Description of Use Case for Make Pick-up Request

Table 3.6: Description of Use Case for Make Food Distribution Post

Use case	Make food distribution post
Primary Actor	Organization
Secondary Actor	Server
Actor's Goal	To make a food distribution post
Pre-condition	Pick-up and distribute food among hungry people. Upload photos and details about food distribution
Post condition	View the food distribution post in newsfeed

Table 3.7: Description of Use Case for View History

Use case	View history
Primary Actor	Restaurant, Individual user, Charity organization
Secondary Actor	None
Actor's Goal	To view history
Pre-condition	Make a post to view own post in history
Post condition	None

Use case	View rank list
Primary Actor	Restaurant, Individual user, Charity organization
Secondary Actor	None

Actor's Goal	To view rank list
Pre-condition	Donate or distribute food to earn 'goodwill' point. Rank list will show the 'goodwill' points of food donor and distributor
Post condition	None

Table 3.8: Description of Use Case for View Rank list

3.6 DESIGN REQUIREMENTS

Plan prerequisite for Café or Individual Client

- Ready to enlist.
- Login.
- View newsfeed.
- Make a post on food accessibility by including a picture and dietary subtleties.
- Able to set a pickup location and time.
- View own profile.
- View own 'goodwill' points.
- View the rank list of top donor and food distributor.

Design requirements for admin

- Full access in database.
- Register charity organization
- Monitor users.
- Can delete any unwanted posts.
- Block any unexpected user.

3.7 CONCLUSION

Our Android application was made utilizing Android Studio and a Firebase data set. We are confident that our application can limit food squander from now on and urge people to give extra food to admirable missions.

CHAPTER 4
DESIGN SPECIFICATION

4.1 INTRODUCTION

On the off chance that they haven't recently enrolled, the subsequent choice is the client module. Moreover, enrollment might be finished utilizing Facebook or Gmail. The client might pick what to give after login into their record, or they can submit a request utilizing the application and determine the sum and their commitment financial plan. Request installments are made with money down. Clients might follow the riders' whereabouts as they go to satisfy their orders. Cafés, different organizations, or unidentified people can all be clients.

4.2 ANDROID STUDIO

An IDE with a particular spotlight on Android called Android Studio was made. Java and XML are utilized by Android Studio. For making versatile applications in light of the Android stage, Java supposedly is the most ideal decision. Android's APIs and Java libraries make this conceivable. Since Java and Android APIs are both used to make code for Android applications, it is clear to utilize Java for Android applications [27]. XML helps with the format and visual plan of an application, as well as the situating and styling of its numerous components, for example, buttons and text sees [10].

4.3 AREA OF ANDROID STUDIO FEATURES:

- Quick App Run

- Firebase Connectivity

- Speedy Emulator

- Graphical Layout Editor

- Create App for All Devices

- Smart Code Editor

4.4 JAVA

James Gosling made the well-known programming language Java while working at Sun Microsystems. The latest Java rendition is Java SE 14, which was made accessible in March 2020. The principal objective of Java was to make:

- Portable

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- Secure

- Simple

Java is the most generally used language for making portable applications. Java code should be two times arranged to execute. It is first converted into bytecode. When bytecode is executed, the Java Virtual Machine changes over it into machine code and loads it into memory (JVM) [8].

To explore between pages in this application, Java language is used. Java's theoretical schedule class permits clients to indicate the day, month, and year. The spinner class is likewise used to give choices to clients. Spinner offers choices, permitting the client to rapidly pick. The spinner class is generally a drop-down list. The client started botches are shown utilizing the Set Error strategy.

Java is used in

- Mobile applications

- Desktop applications

- Web applications

- Web servers and application servers

- Games

Database connection.

4.5 XML

Extensible Markup Language is known as XML. Because the data is stored in plain text format, it is a hardware and software tool that is used to store and transfer data. It carries no instructions on how to be presented. For XML, there is no requirement for predefined tags. It is relatively simple to switch to a new operating system, programs, and browsers without losing data. XML can be read by humans and machines. It is platform- and language-independent. This program uses XML to create pages with backgrounds, picture buttons, layouts, text fields, and other features [5].

Features of Xml:

- Understandable
- 100% portable
- Extendable
- Compatible with java
- Easy to code

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4.6 FIREBASE

Without a back-end server, applications might be made utilizing the Firebase ongoing information base. It is fit for taking care of ongoing synchronization's intricacy with effectiveness. For Java, JavaScript, Android, iOS, and a rest API, Firebase incorporates libraries. You can send an endless number of upstream and downstream messages with Firebase cloud informing. Firebase Authentication offers highlights including email approval, account association, and record incorporation [11].

Features of firebase:

- Real-time database
- NoSQL database
- Backend as a service
- Auto backup
- Easy to use

SI.No.	Test	Expected Result	Result
1	Login	The pre-configured credentials should allow the user to access his account.	Successful
2	Sign-up	Effectively putting away client information in the data set.	Successful
3	Share Food	The client ought to have the option to transfer data about the food, for example, the food class, depiction, termination date, address, and conveyance strategy.	Successful
4	Book Order	The client ought to have the option to call the food provider, inspect the food that others have given, and book the food.	Successful

5	Notify	The individual who picked the illuminate decision will get cautioning when the banquet demand is dropped or booked.	Successful
6	Remove Post	The information base no longer contains the food post.	Successful
7	Message Passing	Correspondence is laid out between the contributor Furthermore, beneficiary, through email or telephone or area sharing office.	Successful
8	Feedback	The client ought to ready to post criticism and audits of given food.	Successful

Fig.6. Firebase Architecture

Table 1: Saving data in firebase

Set	Used to define path for data like messages/users/<username>
Update	Update some of the keys for a defined path without changing all data.
Push	Insert new data list in database messages/users/<unique-user-id>/<username>
transaction	Transaction can be used for complex data which have the problem of corruption by concurrent updates

II RESULTS AND DISCUSSION

Table 2: Result Table

4.7 INTERACTION DESIGN AND UX

Correspondence arrangement is a significant component in the colossal field of Client Experience (UX) plan. Client experience (UX) arranging is the most well known strategy for creating items that supply huge and overall pivotal encounters. Correspondence design is obviously a region that explores the collaboration between a structure and its client over an association point. Albeit this is every so often considered a different subject named "information plan," it might likewise incorporate arranging zeroed in on how information ought to be acquainted inside such a structure with empower the client to deal with that information. Clients view our item as truly interesting. This program's UI (UI) has been intended to be inconceivably easy to comprehend and utilize.

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4.8 IMPLEMENTATION REQUIREMENTS

We utilized various instruments, characteristics, and parts to actually execute our android application project. We go through every one of the assets, characteristics, and components we used to make our Android application undertaking and make it interesting to clients in the Implementation needs part.

4.8.1 THE EMULATOR

An emulator is a sort of Android Virtual Gadget (AVD) that reenacts a specific Android gadget and might be utilized to run any Android venture or application. On their own PC, the engineer might execute and test Android applications involving an Android emulator as the objective stage (PC). Android emulators can be utilized whenever wanted. Our program is worked on both an individual Android gadget and an Android emulator. The emulator utilizes a similar programming as the first equipment. The emulator is exquisite for projects that copy Android.

4.8.2 ANDROID SDK

Android SDK is where Android improvement begins (Programming Advancement Pack). The Android SDK is a social occasion of instruments used to make and cultivate any sort of Android application for the Android stage. In this manner, Android SDK is an essential arrangement of devices for making any Android application. We use the Android SDK to make our Android applications and to test them when we want to execute them to see the outcomes. To run this application, SDK rendition 16 (Android 4.1, Jelly Bean) is fundamental.

4.8.3 FIREBASE

A stage for making portable and web applications, Firebase, was made by Firebase Inc. in 2011 and was bought by Google in 2014. Real-time data set and backend administrations are presented by Firebase. The assistance offers APIs to application designers that empower synchronization of utilization information among clients and distributed storage utilizing Firebase. The business offers client libraries that make it conceivable to incorporate applications written in JavaScript, Objective-C, Swift, Objective-C, Android, and iOS. Moreover, admittance to the informational collection is given through a REST Programming interface and associations with various JavaScript structures, including AngularJS, Respond, Ember.js, and Backbone.js. The REST Programming interface utilizes the Server-Sent Occasions standard, a Programming interface for laying out HTTP connections that get spring up messages from a server. Engineer clients of the continuous data base can safeguard their information by utilizing the association's server-side upheld safety efforts. [13]

4.8.4 PERMISSIONS REQUIRE
- Read and write access of external storage.

- Internet permission.
- Camera permission. Location access permission

4.9 CONCLUSION

Individuals use versatile applications for various purposes, and this pattern is consistently filling in fame. The proposition's suitability will decrease food squander. In our day to day exercises, food is frequently squandered. Rather than being discarded with the garbage, it might just be used to really focus on poor people. It considers both the area of the accessible excess food and the amount of food that is advertised. It checks out to utilize it. Thus, it isn't confounded to utilize this application. Subsequently, the FTH convenient application might have the option to draw in a huge customer base and be useful in tending to the general worries of yearning and food squander.

CHAPTER 5
SYSTEM DEVELOPMENT

5.1 INTRODUCTION

This article clears up how for make an Android application for decreasing food squander. Assuming that people in general uses this application capably, it will without a doubt assist with limiting food squander. We know that food squander is a typical issue these days, and we can put resources into an application like this to address it. We have fostered an Android versatile application that empowers organizations and, surprisingly, the overall population to give and impart their food sources and extras to those deprived to resolve the issue of food squander. We have perceived the utilization of versatile and web advances to limit food squander the board. Clients of this application might join, sign in, see things, add things, add merchandise to truck, eliminate items from trucks, log out, and numerous different things. Any client in need might get to the Food Wastage Decrease application to see the food gifts made by different clients and add those products to their trucks for conveyance to those out of luck. This application is more compelling and easy to use since it involves the Firebase information base as stockpiling and a constant data set.

5.2 SYSTEM DEVELOPMENT

Android App Development Kit will be shipped to you and you can learn and build using tutorials. You can start for free today!

1. Android Apps without coding

2. Android App development using Android Studio

3. Mobile App development using Flutter

Food wastage reduction android application- Project Description

First thing you need to ensure you that have the Android environment in your PC, if you don't have please download and if you have one, then let's get started

1. Homepage - This page will have two buttons i.e User Registration and another for User Login.

2. Some recommended modules for the app can be:

- **User registration:** To make a client enlistment structure, utilize this module. The client can begin the methodology whenever enlistment has been fruitful. The client should give specific individual information, like the required subtleties by the name, age, secret key, area, address, and so forth, to enroll.

- **Login credential:** This module is used for Public/User login using username and password.

- **View Items:** This module is used for viewing the item, search location wise and books the food items.

- **Add Item:** This module is used to create a new food item with details of quantity, location, address contact information, etc.

- **Add Items to Cart:** In this module, we can add multiple food items to cart for booking.

- **Booking the food item:** In this module, we can book the item and send that item to needy people

- **Remove an Item from the cart:** If the food item is not relevant to the people, we can delete food items to cart for booking in this module.

- **Delivery:** This module can be used to track the delivery service.

- **Database:** This module contains the entire information of the app.

- **Admin Module:** Systems for this module reestablish every one of the updates, expansions, and wiping out of information related with areas and different information. Basically, the chairman can pick a proper speed.

- **3. Java-** At the point when we talk about the Android application, the most surprising phrasing rings a bell. We'll involve Java as our programming language for the present.

4. XML- XML for design/layout the app.

5. Database- for storage purposes and this app will use firebase

5.3 THE USE OF A DATABASE

During the execution stage, which additionally includes introducing the Data set Administration Framework (DBMS) on the primary hardware and overhauling the informational collection to ideally work with that gear and the programming stage, the data base is made and the data is stacked. The beginning information could either be new information that is straightforwardly gathered or obsolete information that is imported from a DBMS. The architect can execute informational index security and award the different clients approved admittance in light of their requirements.

5.4 DESIGN OF DATABASES

We picked Firebase as the data administrator to store information in our Android application. A client's post on food openness is promptly noticeable in the selected affiliation's newsfeed. There is compelling reason need to try resuscitating the newsfeed. We would need to over and over reload the newsfeed to acquire the

latest changes on the grounds that MySQL server doesn't uphold ceaseless informational collections the manner in which Firebase does. In our venture, we utilized Firebase to accumulate from continuous information sources. A couple of screen shots of the back-end informational index for our work have been coordinated.
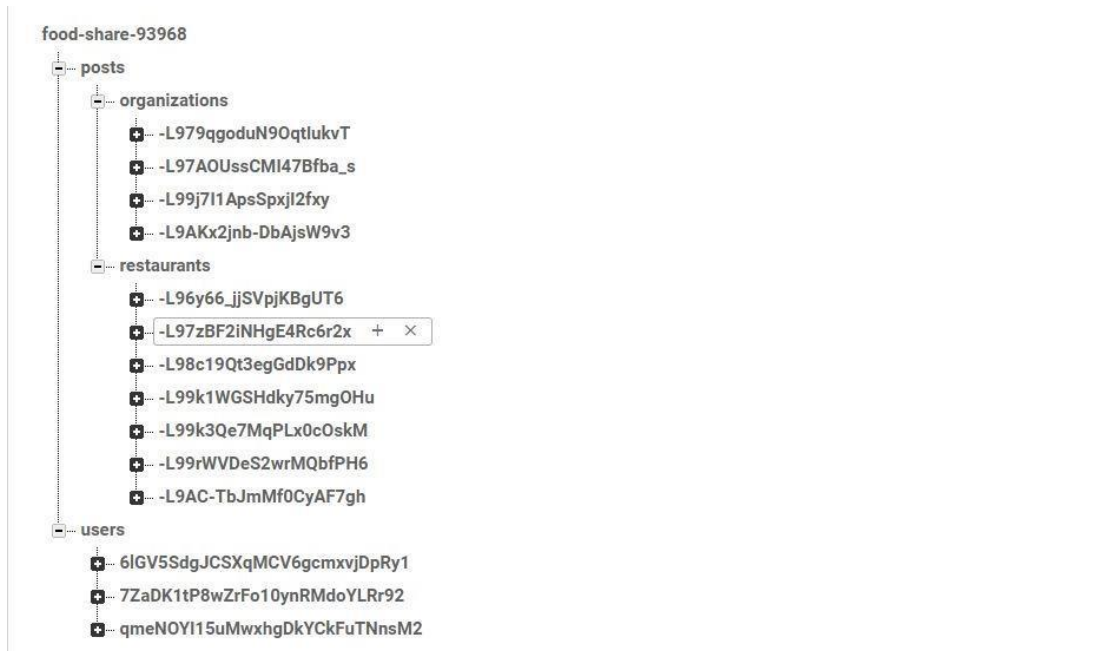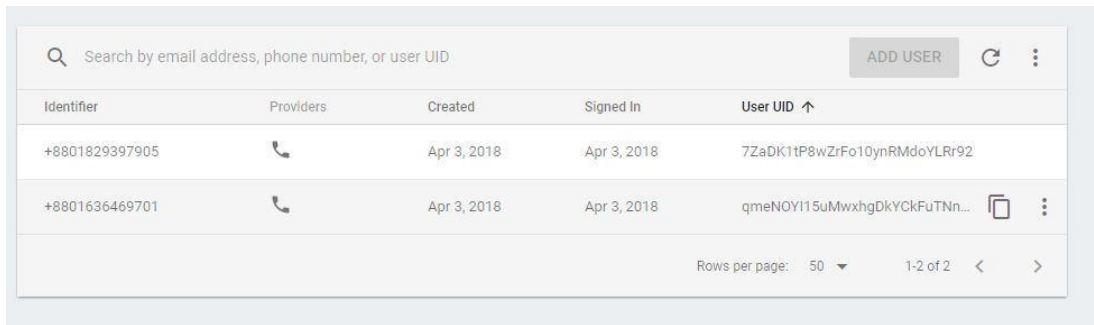

Fig. 5.1 Database Implementation

Fig. 5.2 Database Storage

Fig. 5.3 Check of Telephone Number

5.5 INTERACTION DESIGN

Clients of our program view it as extremely fascinating. It is clear to give the necessary data in light of the fact that the data is given in an effectively available manner. A portion of the critical components for planning an intuitive application have been examined.

We used phone number check, which is secure and straightforward, to enlist and sign in. We can rapidly add the telephone number to our application. The affirmation code can likewise be naturally filled in by our PC when a check number is shipped off a telephone number. The client isn't expected to compose the actually take a look at code in. The data that we mentioned from clients during enrollment is introduced such that makes it simpler for clients to comprehend and finish. At the point when the client needs to give a photograph, they can either take one themselves or pick one from the presentation. We likewise used a clock to decide the get time and a guide to decide the get area. An association can inspect a guide showing the course from its area to the food pickup.
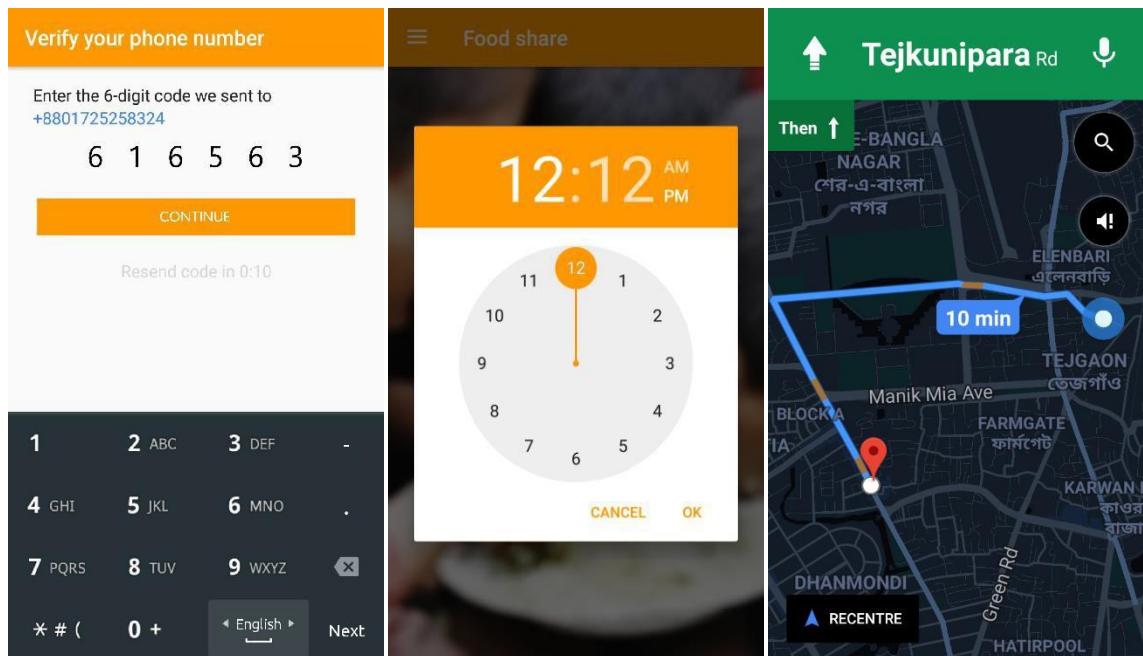
Fig. 5.16 Screenshot of Implementation of Interactive Design

5.6 CONCLUSION

The recommended application will diminish food squander while likewise fulfilling different necessities of beneficent associations, like those for apparel, books, kitchenware, and so on. The application disposes of the students' current manual correspondence issues. Since the application was made utilizing the Android SDK, it is easy to use. The program is incredibly speedy, and any organization exchange might be taken care of. Understudies are immediately educated regarding other extracurricular subtleties through the application. This makes it simpler for those deprived to find food in their space and get what they need. With the assistance of this application, gathering food is simpler and more lovely for people.

CHAPTER 6
IMPLEMENTATION AND TESTING

6.1 INTRODUCTION

Testing has been done proactively on our task. As every ability is created, it works appropriately. Unit testing is completed in this occurrence. While a portion of the page joins in the task have been tried. expected to be Since we developed the actions in general and don't have ace examiners, we are well acquainted with client prerequisites and have attempted and tried client suspicions as rundown things. Subsequently, we can say that we do a wide range of testing, for example, unit testing, coordination testing, and affirmation testing.

6.2 IMPLEMENTATION

The proposed mobile application has the following modules

1. Login and Registration Page
2. Home Page
3. Menu Option
4. Share Page
5. Book Order
6. Feedback

Login and Registration Page

Client name and secret word are expected for login. Whenever a client first logs into this program, he should enlist with a legitimate email address, username, secret key, cellphone number, and address.

Fig.2. *Login Page*

Home Page

After successfully completing the registration, home page will be displayed. Home page displays four options: Menu, Share, Book order and Feedback.
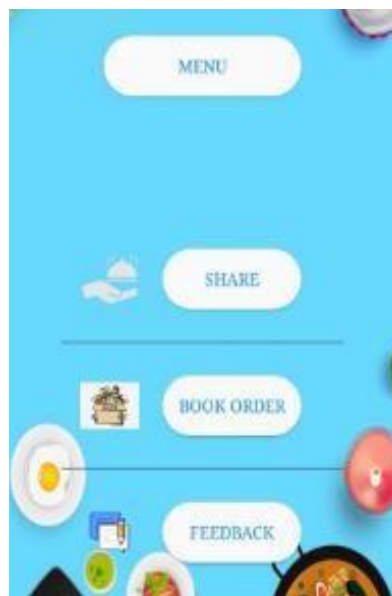

Fig.3. Home Page

Menu Option

Menu option consists of My profile, notification, My order and application language.

- **My Profile** - In My profile, user can update his/her details.

- **Notification** - If user needs notification of this application, he can turn on the notification. Then he will get the notification from application.

- **My order** - Order details will be displayed in my order option. Previous Food order details also displayed in my order option.

- **Language** - User can also choose application language. English and Tamil languages are supported.

Share Page

Share page is used for sharing food. If anyone has excess food and he wish to donate the food he can use share page. Share page option displays food category, food description, validity date, address and delivery type.

- **Food Category:** User has to select the type of food which he donates in food category. Food category displays food list like biscuits, tiffin items, rice, gravy, etc.

- **Validity Date:** User has to give validity date of food. This indicates the expiry date of the food. The minimum of one day validity is mandatory. The application doesn't allow the donor to upload the food details if the expiry date is less than one date.

- **Food Description:** In food description, user has to enter the food details like amount of food, number of persons can eat, etc.

- **Delivery Type:** The delivery type of food is either pickup or delivery. The donor can either deliver the food or the receivers can pick up the food.

Fig.4. Donate Food Description

Book Order

In book order page, user can see the list of food donated by other users. If user needs food, he has to click on the view option and it will display the food details with delivery type.

It provides four options: call, location, report and receive. User can call food donor in call option [16]. In location option, pickup location will be displayed. Report option allows user to write report about food. Receive option is used to order the food. On clicking receive option; user has to enter the details of receiver who picks it up. If he is a new user, he must enter his details otherwise he can use his login details. Add on feature **"NOTIFY"** is added. If the food is already booked, then notify option is available. In case if the order is cancelled then notification will be sent to user who used the notify option. The booked food can be cancelled by the receiver/donor in case of emergency. The reason for cancellation should be filled by the user. If the user repeats cancellation continuously then the user membership will be cancelled.

Feedback

Feedback page is used to post feedback and reviews of donated food. User can give ratings to the shared food and pictures can also be uploaded in order to motivate others to donate more food. If the quality of food is not good then the donor will be given warning, if the user actions continue then his membership will be cancelled.
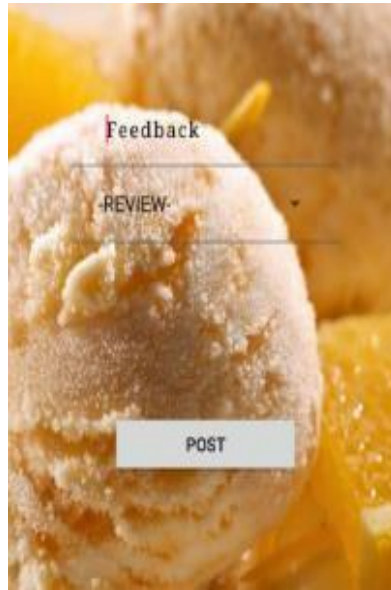
Fig.5. Feedback Page

6.3 CONCLUSION

Individuals use versatile applications for different things, and this pattern is getting more famous consistently. The proposition viable will reduce food squander. Food is squandered every now and again in our regular routines. It could be used to take care of the destitute as opposed to being tossed out with the rubbish. It incorporates the area of the excess food accessibility as well as how much food that is advertised. It is an instinctive application. Along these lines, it isn't muddled to use this program. In this way, the FTH portable application can possibly draw in a sizable client base and be useful in tending to the overall worries of yearning and food squander.

CHAPTER 7
SWOT ANALYSIS

7.1 INTRODUCTION

➢ Develop confidence in the system by showing that donations are being put to good use at all times, making donor efforts worthwhile.

➢ Coordinate the efforts of donors. Establish a communications network between donors and recipients.

➢ Make it easy to donate by providing timely pick-up and delivery of food and a cadre of volunteers to help with harvesting and transporting produce from local growers.

➢ Make it easy to donate by providing timely pick-up and delivery of food and a cadre of volunteers to help with harvesting and transporting produce from local growers.

7.2 SWOT ANALYSIS

An association's assets, shortcomings, open doors, and dangers might be distinguished and investigated utilizing the SWOT examination system. Thusly, a depiction of my proposal's self-investigation is given beneath.

7.2.1 STRENGTHS

- Reduces hunger
- Improves health
- Reduces landfill use
- Builds sense of community
- Reduces methane gas
- Generates tax deductions for donor firms
- Reduces food cost for livestock
- Creates some jobs
- Inspires some lower income families to join the workforce

7.2.2 WEAKNESS

- Safety - potential for sickness among people and livestock if donated food not handled properly
- Safety - workers involved in "gleaning" operations could get hurt while working to recover food

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- Negative perception of "old" food (food at or past sell by date), or blemished food (fruit, vegetables)

- Weather

- Need a flexible workforce to work varied hours on short notice

- Lack of storage space at donor locations

- Without frequent pick-ups, the system does not work

7.2.3 OPERTUNITIES

- Cut city costs by teaming up Get close enough to burden allowances

- Reduced garbage disposal costs

- Reduce landfill operations

- Create goodwill

- Utilize your resourcefulness to achieve something

- All participants get positive press

- Enhances area's appeal

7.2.4 THREATS
- public grievances

- Liability fears

- Fear of lost revenue by businesses

- Changes in the workforce (especially chips in)

7.3 CONCLUSION

Teaching general society is a pivotal initial phase in lessening food squander, and the public authority is significant in bit by bit changing individuals' ways of behaving. In any case, it should track down a technique to communicate with the two individuals and the overall population to help the formation of new normal practices and advance empowering conditions in a long haul, vital way to deal with conduct change.

CHAPTER 8
CONCLUSION

8.1 CONCLUSION

One of the issues the earth is currently managing is food squander. Food deficiencies will influence the total populace except if essential measures are made to decrease food squander. We can take care of the destitute people who don't have anything to eat on the off chance that you can keep food from going to squander.

To forestall food squander through gifts, we made the Android application "Food Share." Through our application, any foundation or individual client might contribute food that they have extra. The food will be accumulated by a worker from our magnanimous gathering, which is enrolled, and given to poor people.

With the help of our effort, we want to decrease food waste. Our initiative may contribute the extra food, and it will also provide food to the hungry or impoverished who don't have enough to eat. As a result, our technology has the potential to significantly impact society by preventing food waste. Our objective is to create a connection between food surplus restaurants or private users and volunteer food collection groups.

8.2 FURTHER SUGGESTED WORK

Our drawn out objective is to execute this thought locally and principally urge restaurants to save their extra food. We will before long offer more highlights to captivate clients to use our program for food conservation. Rather than a rundown view, we might incorporate a guide view with the goal that associations can see all the neighborhood food accessibility posts. We may likewise incorporate an arrangement of cautions that will educate the workers regarding the association assuming a close by food accessibility post is made. We will connect public venues where different social or business exercises are arranged. Moreover, we will sort out a mission to raise individuals' familiarity with food squander and urge them to utilize our application to forestall food squander.

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APPENDIX - A

report

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