Feed the Hunger (FTH)-An Android Application to Reduce Food Wastage

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ABSTRACT: *Food wastage is the major problem in the world. Food and Agriculture organization (FAO) of the UN estimates, approximately one third of the food produced for the human consumption, which amounts to 1.3 billion tones, gets lost or wasted. In India around 40% of foods produced are wasted. Weddings, events, restaurants, hostels and houses are a major source for food wastage. Many non-profit organizations in India are working to eradicate hunger, malnutrition and food wastage in India. They are working towards eradicating the food wastage by collecting the food and distributing to the needy. This paper aims to develop a mobile application which makes the process of collecting and delivering the donated food in efficient manner. The mobile application allows the donors and the receiver to register their details and post the availability or requirement of food. The users can book the available food and track the food until it is delivered. This application can accept both freshly cooked food and leftover food. In this application donors can post the pictures of their food which will motivate others to donate.*

Keywords: **Android smart phone, Food Wastage, Needy, Food Donation, Post.**

Abbreviations: FAO, Food and Agriculture Organization; UN, United Nations;

I. INTRODUCTION

There is a global trend to an active involvement of persons in the maintenance and restoring of health. For human survival food is essential. Without food man cannot live for more than 20 days. India is the 2nd largest country in population. In India, around 40% of the foods produced are wasted. India ranks 63 in the Global Hunger Index (GHI, UN data). FAO estimates in 'The State of Food Security and Nutrition in the world, 2017' report, 14.5% of the Indian population, are undernourished. India is the home to largest undernourished population in the world. Food wastage is an alarming issue in India. Our street and dust bins have sufficient proof to prove it. Food Wastage reflects the hunger, pollution crisis and indicates the economic problems of the country like inflation. Weddings, family events, restaurants, hostels, canteens and houses are a major source for food wastage. Many non-profit organizations are helping to reduce this food wastage by collecting the food and distributing it to the needy. All the efforts of the government and organizations will not successful if there is no individual contribution. Each and every person should have the responsibility to understand the importance of food and should try to reduce food. Excess food can be refrigerated and reused or can be donated to the needy. Many people are interested to donate food but there are not aware of how to donate or whom to approach. In India, the introduction of 4G has made the Smart phone and internet connection available to each and every home. Hence, to make the process of donation easy, a mobile application can be used to encourage people to donate the food and can reach the needy. Feed the Hunger is android based application, developed on Android Studio using java and Xml. Firebase is used as backend database. Feed the Hunger application acts as medium to donate the excess food instead of wasting the food.

II. RELATED WORK

A Food Wastage Reduction Mobile Application [4] was contributed by Ayesha Anzer, Hadeel A. Tabaza, and Wedad Ahmed (2018) The motive of this paper is to avoid Food Wastage. Food waste management is very important since it can improve our environmental and economic sustainability. This paper explains an android mobile application which allows restaurants to donate and share their leftover food with people who are in need of food. Using this application, the users can register, login, view available food items, add new items, add items to cart, remove an item from cart, and log out. Firebase storage and real-time database is used in this application. Any user can see all the food images donated by different users.

Mobile Application for Excess Food Donation and Analysis [2] was the major contribution of Adline Freeda1 R, Sahlin Ahamed M.S (2018).This paper provides an android application which minimizes the amount of food wastage produced in restaurants, functions and mess. This app gives the registered users two options. They have to choose donate or claim the food. The user who wishes to donate have to provide the details of excess food (name and quantity), location (GPS) and contact details. The user who claims the food has to provide the organization name and number of people associated with it. The donor sorts the claims based on priority and chooses the recipient. It uses data analysis to visualize the impact of donating food.

Food for You (F4U) Mobile Charity Application [1] was published by Suraya Masrom, Abdulla Sani Abd. Rahman, Farah Norliyana Azahar, Nasiroh Omar (2018).Food for You (F4U) is a mobile charity application and it is developed with objective to reduce the burden of homeless people who need foods to continue living. This application is beneficial in minimizing the food wastage problem. This application allows the user to register as needy, donator or supplier. Additional map feature is available in this application, which shows the location of users by using different coloured marker based upon the type of user. This allows the donator and supplier to donate food or money to the needy. The needy can request for food or take free food available in map.

A New Approach to Reduce Food Wastage using Ubiquitous Technique [8] was contributed by Nandhini H Jadhav, Narendrababu C.R, Banu Prakash G.C (2015). Food cloud application provides connection between NGO and Donors with a specific end goal to give the food to the needy people. NGO get the notification from restaurant or can search for the restaurants which donates the leftover food. After that they collect and distribute the food to the needy people. NGO will send the feedback to the restaurant where they received the food. NGOs can send their queries to Hotels seeking information about food wastage which could be avoided. NGOs can upload the reports of how the food is used for better transparency. It shows the route and location of NGOs and Hotels to help the drivers to find the location.

Food Wastage Reduction through Donation [6] published by Divyesh Jethwa, Ayushi Agrawal, Rohan Kulkarni, Leena Raut (2018). This system gives a new internet-based application which provides a platform for donating leftover food to needy people or organizations. The system is shown to be an effective means of donating food over the internet. It shows the potential for avoiding the wastage of food. This system will create a common portal for hotels or restaurants and charities, charity can directly contact restaurants who have excess food and it generates report which will show how much food is donated by the restaurant and providing reward points for them. Food Donor can be any organization, institute or college who wishes to donate food and create a new food donation request. Food receiver can be any charity who is seeking for food. A new food donation request will be shown on the portal. Once the request is accepted, a notification is sent to Third party vendor who is responsible for moving food from donor to receiver. The premium users will donate the food on a daily basis.

III. EXISTING SYSTEM

Seva Kitchen is an initiative initially started to help the patients and their relative in hospital to get a proper meal but later they started to help the hungry people. It started with a group of volunteers who cook at home, pack and deliver the food to the hospital. Seva Kitchen launched the mobile application "SevaKitchen" to connect the donor and the receiver. The user can either register as a donor or receiver or both.

The user willing to donate has to post the type of food, at least three photos of the food to be donated and location of pickup. The volunteers pick up the food and deliver the food to the needy. The android application has a feature to add the details of hunger zone. The hunger zone can be night shelter, slum or location of needy people. The details of hunger zone such as brief description, number of people, photos and location can be added. The donor can check the details of the hunger zones.

DISADVANTAGES:

The existing system has the following disadvantages

- Volunteers deliver the food. There is always shortage of volunteers to deliver the food.
- This application allows donors to donate only freshly cooked food.
- They do not accept leftover food from home or any other restaurants.
- No feedback from the receiver or donor. If there is any issue in the delivery or the quality of the food, it cannot be reported.
- There is no notification feature to intimate the volunteer or organization about the availability of food.

IV. PROPOSEDSYSTEM

The proposed system "Feed the Hunger" Mobile Application provides the platform for donating food to needy people. In Restaurants, canteens, marriages, social and family functions people thrown out so much food. Instead of wasting food, it could be donated to various organization or needy people. Many people wish donate the extra food and many organizations wish to receive the food. This proposed system helps people to donate food as per their capacity. This helps to avoid the wastage of food.

Donors can post the pictures or videos of donated food which encourages others to take part in food donation. It accepts both freshly cooked food and leftover food. This system gets the information of the person who receives food before booking the order. This system also tracks the food until it is delivered so, the status of food will be monitored. Language of the application can also be chosen by user. Notification option is provided to show application notification. User can update his personal information. Delivery type of food can be chosen by user. Distant constrain and expiry time of food is added in this application to reduce the wastage of food.

V.MODULE DESCRIPTION

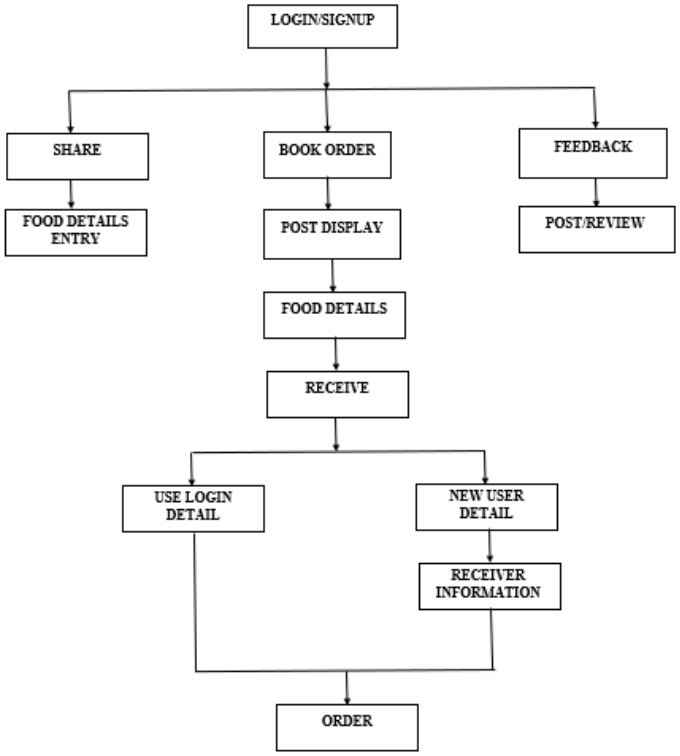

Fig.1.System Architecture

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

The user has to login with user name and password. If the user uses this application for the first time then he has to sign up with mail id, username, password, mobile 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.

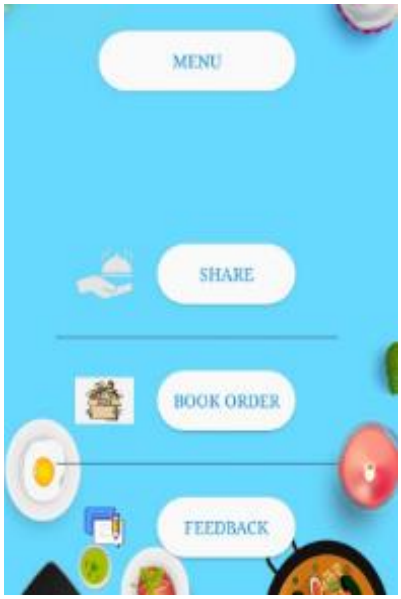

Fig.3. Home Page

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. 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

VI. TECHNOLOGIES USED

1. Android studio

Android studio is an Android focused IDE, designed especially for the Android development. Android studio uses java and xml. Java is considered best for the development of mobile applications based on the Android platform. It is so because Android consists of its APIs and Java libraries. Thus, it is easy using java for Android applications, both android APIs and Java is used to write code for Android apps. Xml helps to design the application layout, how it will look, how components like buttons, text view, etc. will be placed and their styling.

Features of android studio:

- Instant App Run
- Can Connect with Firebase
- Fast Emulator
- Visual Layout Editor
- Build Up App for All Devices
- Intelligence Code Editor

2.JAVA

Java is widely used programming language and it was developed by James Gosling at Sun Microsystem. The latest version of java is Java SE 14 which was released in March 2020. The chief objective of java was to make it:

- Portable
- Secure
- Simple

In terms of mobile application development, java is the most commonly used language. To run java code, it needs to be compiled twice. First it is converted into bytecode. When bytecode is run it is converted into machine code and loaded into memory by Java Virtual Machine (JVM).

Java language is used in this application to move from one page to another. Calendar class is an abstract class in java which provides the user to set month, year and day. Spinner class is also used to give user choices. Spinner provides choices which makes user to easily select the choice. Mostly the spinner class is a drop-down list. Set Error method used to indicate the errors that were done by the user

Java is used in

- Mobile applications
- Desktop applications
- Web applications
- Web servers and application servers
- Games
- Database connection

3. XML

XML stands for eXtensible Markup Language. It is a hardware and software tool which is used to store and transport data because it stores data in plain text format. It does not carry information regarding how to be displayed. Predefined tags are not needed for XML. Without losing data, it

is very easy to upgrade to new operating system, applications and browsers. XML is both machine and human readable. It is language and platform independent.XML is used in this application for designing the pages with backgrounds, image buttons, layouts, text boxes, etc.

Features of Xml:

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

4.Firebase

The Firebase is a real time database used to create applications without back-end server. It can efficiently handle the complexity of real time Synchronization. Firebase has libraries for java, JavaScript, Android, IOS and a rest API. Firebase cloud messaging is used to send unlimited upstream/downstream messages. Firebase Authentication provides functionality like email verification, account linking and integration of existing accounts.

Features of firebase:

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

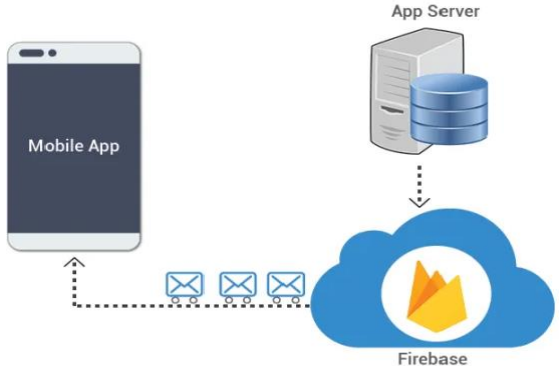

Fig.6. Firebase Architecture

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

VII. RESULTS AND DISCUSSION

Table 2: Result Table

SI.No.	Test	Expected Result	Result
1	Login	The user should be able to access his account using the preset credentials.	Successful
2	Sign-up	Users data to be successfully stored in the Database.	Successful
3	Share Food	The user should be able to upload food details like food category, food description, validity date, address and delivery type.	Successful
4	Book Order	The user should be able to view food donated by other users and to book the donated food and call food donor.	Successful
5	Notify	When the food order is cancelled/booked the notification will be sent to user who used the notify option.	Successful
6	Remove Post	The food post no longer exists in the Database.	Successful
7	Message Passing	Communication is established between the donor and recipient, through email or phone or location sharing facility.	Successful
8	Feedback	The user should able to post feedback and reviews of donated food.	Successful

VIII. CONCLUSION

Peoples use mobile application for various purposes and the trend is increasing from year to year. The proposed application shall reduce food wastage. There is a lot of food wastage that occurs in our daily. Instead of throwing away the same as trash it can be used to feed the homeless. It provides the location of where excess food is available and details of the food quantity available. It is user friendly application. So, there is no difficulty in using this application. Therefore, FTH mobile application has the potential to get a huge number of users and thus beneficial to resolving the hunger, and food waste global issues.

IX. FUTURE SCOPE

Even though the project is completed to the original requirements, there are some features which can be added are:

- Different languages can be included
- Fulfilling other requirements like books, clothes, etc.
- Making the app supports multiple platforms (cross-platform app)
- Distance constraint can be added. The user should be within 30 to 60 minutes travelling distance.
- Tracking option will be available to track the location of food while transportation.

CONFLICT OF INTEREST

The authors declare here that they have no conflict of interest.

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