EXCESS FOOD MANAGEMENT SYSTEM

A PROJECT REPORT

Submitted by

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BONAFIDE CERTIFICATE

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ABSTRACT

The Excess Food Management System (EFMS) is a comprehensive platform designed to address the critical issue of food wastage by facilitating the efficient redistribution of surplus food to those in need. Through donor registration and management, surplus food items can be easily added to the system, specifying details such as quantity, location, and intended recipients. Recipients, including shelters and NGOs, can register and authenticate to receive surplus food donations, placing orders based on their requirements. The system tracks orders, manages inventory, and provides real-time status updates to donors and recipients. An admin dashboard offers comprehensive oversight, enabling administrators to manage user accounts, monitor system activities, and generate reports on food donation and distribution metrics. By leveraging technology to connect donors with recipients, the EFMS aims to foster a more sustainable and compassionate approach to food management, ultimately reducing food wastage and addressing food insecurity in communities.

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DHANUSHKUMAR V

TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

In the face of global food insecurity and mounting concerns over food waste, the effective management of surplus and deficient food resources within communities has become increasingly imperative. Despite significant advancements in agricultural production and distribution, millions still suffer from malnutrition and hunger, while a staggering amount of food is wasted each year. In response to these pressing issues, the introduction of Community Food Connect represents a pivotal step towards addressing these challenges by harnessing the power of technology to facilitate the seamless connection between surplus food producers and those in need.

In this digital era, where connectivity and efficiency are paramount, Community Food Connect serves as a beacon of hope, offering a user-friendly platform that revolutionizes the way surplus food is redistributed within local networks. By providing a streamlined and accessible means for surplus food listing, matching, and coordination, this application seeks to not only mitigate food waste but also combat hunger and foster community resilience.

This introduction sets the stage for exploring the transformative potential of Community Food Connect in creating a more sustainable and equitable food system for communities worldwide. By leveraging technology to optimize resource allocation, foster collaboration, and promote social responsibility, Community Food Connect represents a promising solution to the interconnected challenges of food waste, hunger, and community well-being, laying the groundwork for a brighter and more food-secure future.

1.1 PROBLEM STATEMENT

We aim to innovate solutions addressing urban excess food waste and hunger-related deaths while establishing a cost-effective logistic network. This involves efficiently transferring surplus food from cities to areas in deficit, utilizing innovative technology and storage solutions. The goal is to optimize resource usage, minimize food waste, and ensure equitable access to nutritious food, ultimately fostering socio-economic resilience in urban environments.

1.2 SCOPE OF THE WORK

The Excess Food Management System (EFMS) offers a comprehensive solution to food wastage, catering to donors, recipients, and administrators. By streamlining donation processes and providing real-time tracking, it targets charitable organizations, commercial entities, and potential partnerships with food delivery platforms and restaurants. With scalability for future expansion into related areas, the EFMS presents a compelling solution for addressing food wastage globally.

1.4 AIM AND OBJECTIVES OF THE PROJECT

The primary aim of this project is to develop an Excess Food Management System (EFMS) to effectively manage surplus food resources and minimize food wastage. The project aims to create a user-friendly platform for donors, recipients, and administrators, facilitating seamless food donation and distribution processes.

Establishing partnerships with charitable organizations and commercial entities will expand the reach and impact of surplus food redistribution efforts. Finally, the project aims to ensure scalability and adaptability for future enhancements and expansion into related areas of food recovery and distribution.

1.5 RESOURCES

To develop the Excess Food Management System effectively, essential resources include functional workstations, reliable internet access, proficiency in programming languages like JavaScript and frameworks like Express.js, documentation materials, collaboration tools like Slack, cloud platforms for hosting, project management tools, testing frameworks, and access to online courses for skill development. These resources are crucial for research, development, testing, and project management, ensuring the successful implementation of the system.

1.6 MOTIVATION

The motivation behind creating the Excess Food Management System stems from a profound desire to address the pressing issue of food waste and scarcity simultaneously. By leveraging technology and innovation, this project aims to bridge the gap between surplus food resources and those in need, thereby fostering a more equitable and sustainable food distribution ecosystem.

Moreover, the opportunity to contribute positively to society by reducing food wastage, alleviating hunger, and promoting environmental conservation serves as a driving force for this endeavor. Through the development of this system, we aspire to make a tangible difference in the lives of individuals and communities affected by food insecurity while fostering a culture of resourcefulness and compassion.

CHAPTER 2

LITRETURE SURVEY

Food waste is a significant global issue with profound economic, environmental, and social implications. According to the Food and Agriculture Organization (FAO) of the United Nations, approximately one-third of all food produced for human consumption is lost or wasted annually. This wastage occurs throughout the entire food supply chain, from production and processing to distribution and consumption. In recent years, there has been growing recognition of the need to address food waste as part of broader efforts to achieve sustainable development goals, including reducing hunger and combating climate change.

Various studies have highlighted the scale and impact of food waste. For example, a study by Parfitt et al. (2010) estimated that the total amount of food waste in the United Kingdom was around 15 million tonnes per year, with a value of approximately £17 billion. Similarly, a study by Buzby and Hyman (2012) estimated that in the United States, food waste accounted for approximately 31% of the overall food supply, equivalent to approximately 133 billion pounds of food, worth an estimated $161 billion.

In response to the growing concern over food waste, numerous initiatives and interventions have been developed to reduce food waste at various stages of the supply chain. One such initiative is the development of surplus food management systems, which aim to match surplus food from food businesses, such as restaurants, supermarkets, and caterers, with organizations or individuals in need of food, such as food banks, shelters, and charities. These systems typically use online platforms or mobile applications to facilitate the donation and distribution of surplus food, making it easier for businesses to donate food and for organizations to receive it.

Several studies have evaluated the effectiveness of surplus food management systems in reducing food waste and addressing food insecurity. For example, a study by Schneider et al. (2019) examined the impact of a surplus food redistribution program in Germany and found that the program was effective in reducing food waste and providing food to those in need. Similarly, a study by Schneider et al. (2018) evaluated a surplus food redistribution program in Australia and found that the program was successful in diverting food waste from landfill and providing food to vulnerable populations.

Despite the potential benefits of surplus food management systems, there are several challenges and limitations associated with their implementation. One key challenge is the logistical complexity of collecting and redistributing surplus food, particularly in urban areas where there may be limited storage and transportation facilities. Another challenge is the need to ensure food safety and quality standards are met, as donated food must be fit for consumption. Additionally, there may be legal and regulatory barriers that hinder the donation and redistribution of surplus food, such as liability concerns and tax implications.

To address these challenges, researchers and practitioners have proposed various strategies and recommendations. For example, some have suggested the use of technology, such as blockchain and Internet of Things (IoT) devices, to improve the traceability and transparency of food donations. Others have proposed the development of partnerships and collaborations between food businesses, government agencies, and non-profit organizations to streamline the surplus food donation process.

In conclusion, surplus food management systems have the potential to play a significant role in reducing food waste and addressing food insecurity. However, their effectiveness depends on various factors, including the availability of infrastructure, regulatory environment, and stakeholder collaboration. Further research is needed to better understand the impact of surplus food management systems and identify strategies to overcome the challenges associated with their implementation.

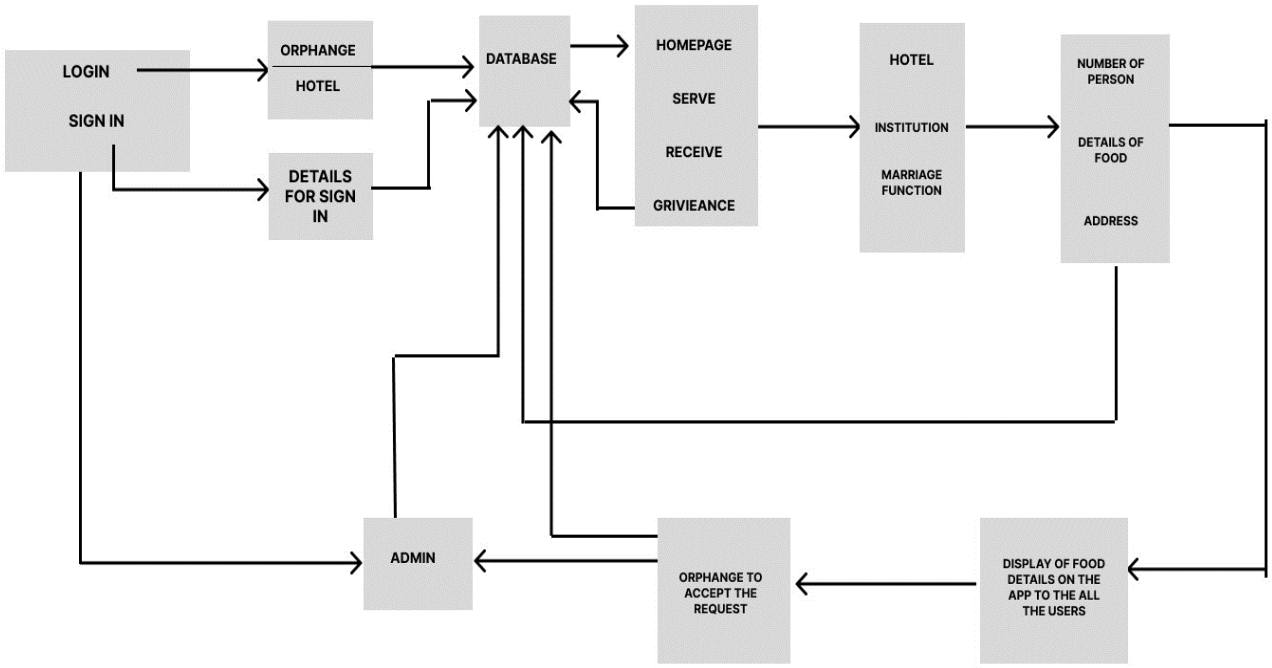
CHAPTER 3

SYSTEM DESIGN

3.1 GENERAL

In this section, we would like to show how the general outline of how all the components end up working when organized and arranged together. It is further represented in the form of a flow chart below**.**

3.2 SYSTEM ARCHITECTURE DIAGRAM



3.3 DEVELOPMENT ENVIRONMENT

3.3.1 HARDWARE REQUIREMENT

The hardware requirements may serve as the basis for a contract for the system's implementation. It should therefore be a complete and consistent specification of the entire system. It is generally used by software engineers as the starting point for the system design.

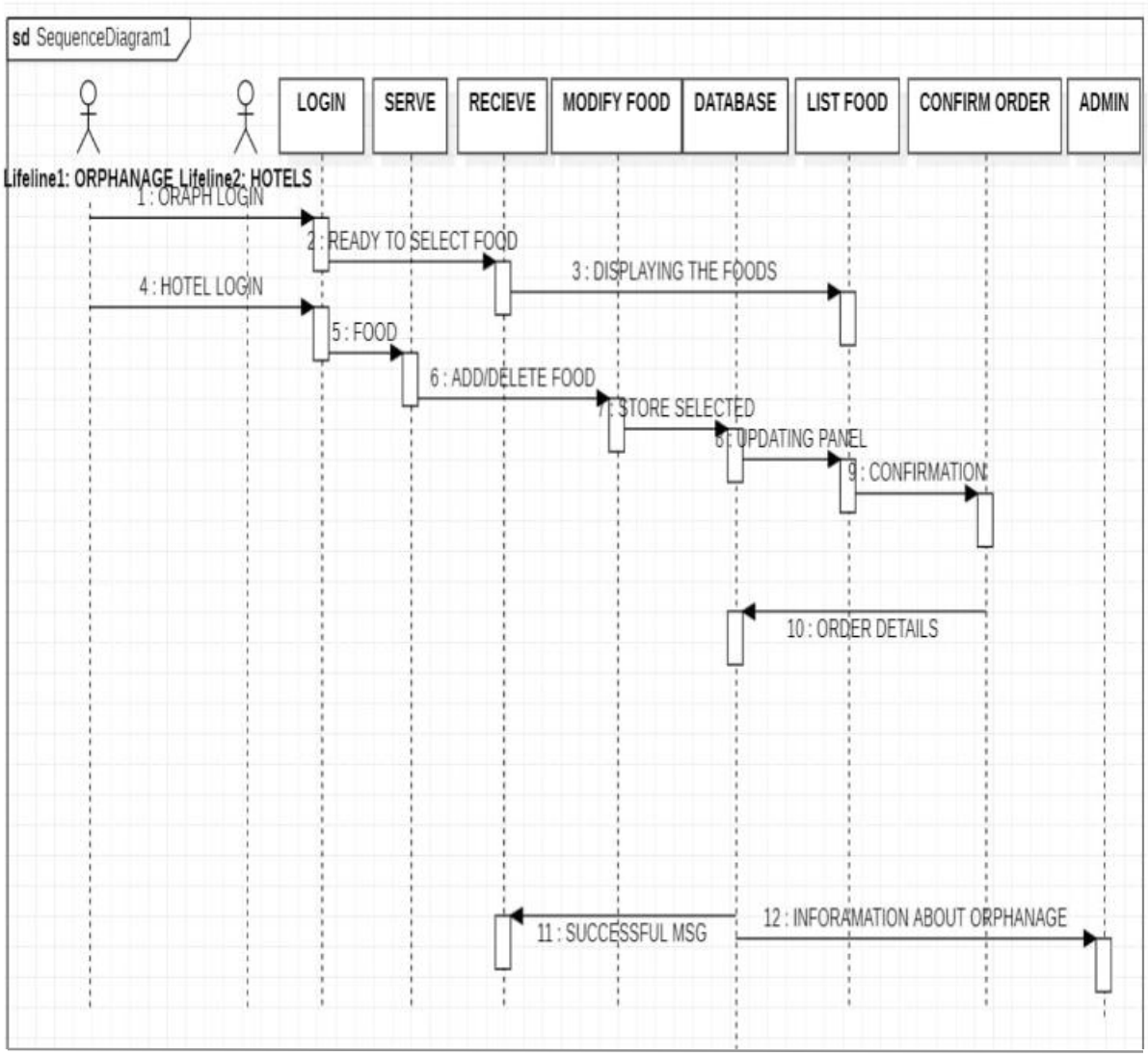
COMPONENT	SPECIFICATION
PROCESSOR	Intel Core i5
RAM	8 GB RAM
MONITOR	15" COLOR
HARD DISK	512 GB
PROCESSOR SPEED	MINIMUM 1.1 GHz

3.3.2 SOFTWARE REQUREMENT

The software requirements document is the specifications of the system. It should include both a definition and a specification of requirements. It is a set of what the system should rather be doing than focus on how it should be done. The software requirements provide a basis for creating the software requirements specification. It is useful in estimating the cost, planning team activities, performing tasks, tracking the team, and tracking the team's progress throughout the development activity.

Visual Studio Code, latest version of Chrome, Android studio and Postman for route checking.

3.4 SEQUENCE DIAGRAM



CHAPTER 4

PROJECT DESCRIPTION

4.1 MODULES

4.1.1 USER AUTHENTICATION

User authentication and profile management are crucial components of any application that requires user interaction. Authentication ensures that only authorized users can access the application, while profile management allows users to maintain and update their personal information.

In the user authentication module, users are required to provide credentials such as a username and password to verify their identity. This process is typically done using secure protocols such as HTTPS to protect sensitive information. Once authenticated, users are granted access to the application's features and functionalities based on their role and permissions.

Profile management allows users to create and update their profiles, including personal information, contact details, and preferences. Users can also manage their account settings, such as changing passwords or updating notification preferences. This module ensures that users have control over their information and can keep it up to date.

4.1.2 FOOD DONATION LISTINGS

The food donation listings module is a key component of the application, enabling users to post details about surplus food they wish to donate. Users can provide information such as the type of food, quantity available, expiry date, and location for pickup. This module allows for easy and efficient sharing of surplus food resources, helping to reduce food waste and address food insecurity within the community.

Users can create and manage their donation listings through an intuitive interface. They can specify any requirements or restrictions for donation, such as dietary preferences or packaging instructions. The module may also include features for users to add photos of the donated food items, which can help attract potential recipients and provide a visual representation of the donation.

The food donation listings module plays a crucial role in facilitating the donation process, connecting food donors with individuals or organizations in need. By providing a platform for users to easily share surplus food resources, the module contributes to a more sustainable and equitable food system, benefiting both donors and recipients alike.

The food donation listings module not only facilitates the sharing of surplus food but also encourages users to be mindful of food waste and its impact on the environment and society. By providing a platform where users can easily

donate food that would otherwise go to waste, the module promotes a culture of sustainability and responsible consumption. Users are empowered to take action against food waste, making a tangible difference in their communities and contributing to larger efforts to combat hunger and reduce environmental degradation. Through this module, individuals and businesses can play a part in creating a more sustainable future for all.

4.1.3 FOOD REQUESTING LISTING

The food-requesting listings module is a crucial component of the excess food management application, enabling users to browse and request surplus food donations based on their needs and location. This module allows users to view available food donations posted by food donors and submit requests for specific items. Users can specify their requirements, such as the type and quantity of food needed, as well as their location for pickup. The module facilitates the process of connecting users in need with surplus food resources, helping to reduce food waste and alleviate hunger within the community.

The food-requesting listings module features a user-friendly interface that allows users to easily browse and search for available food donations. Users can filter search results based on criteria such as food type, quantity, and location to find donations that meet their specific needs. Once users find a suitable donation, they can submit a request through the platform, providing details about their requirements and pickup location. The module also

provides real-time updates on the status of their requests, keeping users informed about the progress of their requests.

Overall, the food requesting listings module plays a vital role in connecting surplus food resources with those in need, contributing to the efficient and effective management of excess food within the community. By providing a platform for users to request and receive surplus food donations, the module helps to reduce food waste, alleviate hunger, and foster a sense of community support and solidarity.

4.1.4 REAL-TIME NOTIFICATION

The real-time notification module is a critical component of any application that aims to connect surplus and deficient food resources within a community's network. This module plays a crucial role in keeping users informed and engaged with the platform by sending timely updates about new food donations, matched requests, and other relevant information. By providing real-time notifications, the module ensures that users are promptly notified about important events, helping to facilitate the efficient and effective matching of surplus food with those in need.

One of the key features of the real-time notification module is its ability to deliver notifications instantly to users' devices. This ensures that users receive timely updates about new food donations or matched requests, allowing them to take immediate action. By delivering notifications in real-time, the module

helps to ensure that surplus food is quickly and efficiently distributed to those who need it most, reducing food waste and helping to alleviate hunger in the community.

Another important aspect of the real-time notification module is its ability to personalize notifications based on user's preferences and past interactions with the platform. This allows the module to deliver notifications that are relevant and meaningful to each user, increasing user engagement and satisfaction. By personalizing notifications, the module helps to ensure that users stay informed about relevant events and opportunities to donate or receive food, increasing the overall effectiveness of the platform.

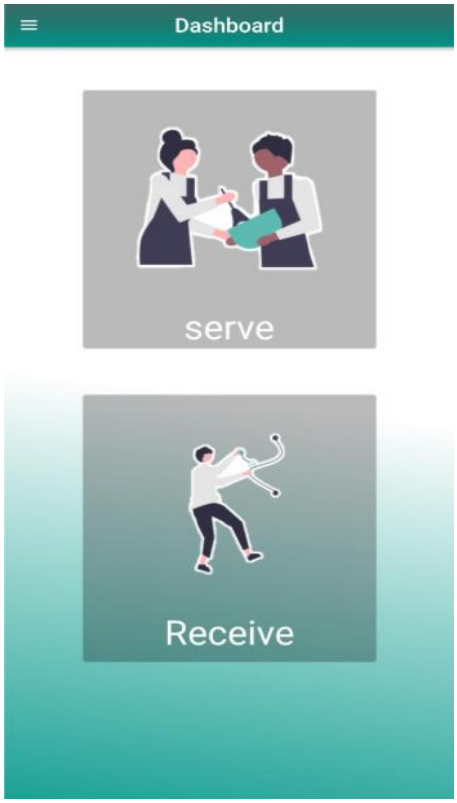
In conclusion, the real-time notification module is a crucial component of any application that aims to connect surplus and deficient food resources within a community's network. By delivering timely and personalized notifications to users, the module helps to facilitate the efficient matching of surplus food with those in need, reducing food waste and helping to alleviate hunger in the community.

CHAPTER 5

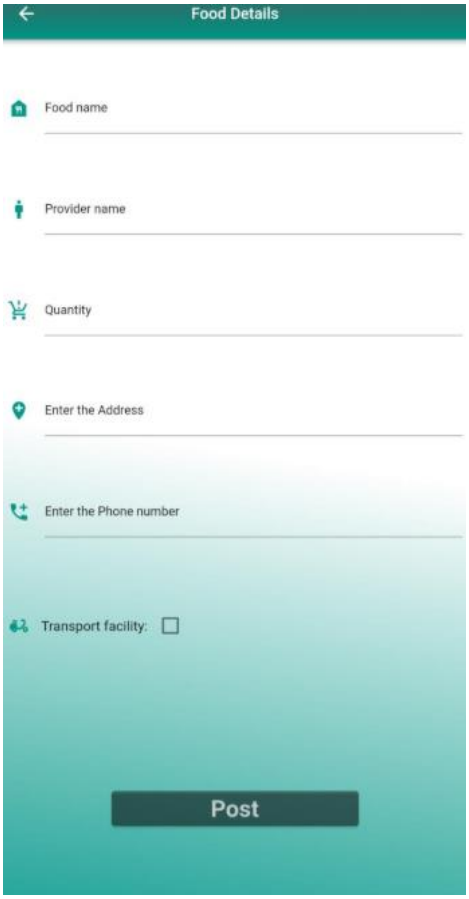
RESULTS AND DISCUSSIONS

5.1 OUTPUT

Login and user dashboard page:



Post food and receiver page:



5.2 RESULT

The surplus food management application proved to be a valuable tool in connecting surplus food resources with those in need within the community. Through the application, surplus food donors, such as restaurants, supermarkets, and caterers, were able to easily post details of their excess food, including quantity, type, and availability. On the recipient side, organizations and individuals in need of food, such as food banks, shelters, and charities, could browse listings and request food donations that met their requirements.

One of the key results of the project was the significant reduction in food waste achieved through the application. By providing a platform for surplus food donors to easily donate their excess food, the application helped divert a substantial amount of food from ending up in landfills. This not only reduced environmental impact but also contributed to the goal of reducing hunger and food insecurity within the community.

Another important result was the positive impact on food recipients. By facilitating the donation and distribution of surplus food, the application helped provide nutritious meals to individuals and families facing food insecurity. This not only helped address immediate hunger but also had broader health and social benefits, such as improved nutrition and well-being.

CHAPTER 6

CONCLUSION AND SCOPE FOR FUTURE ENHANCEMENT

6.1 CONCLUSION

In conclusion, the surplus and deficient food management application serves as a pivotal tool in bridging the gap between surplus food providers and those in need within a community. By leveraging technology, this application facilitates the efficient distribution of excess food to orphanages and other organizations, reducing food wastage and addressing hunger-related issues.

Through the collaborative efforts of food donors, volunteers, and beneficiaries, this application fosters a sense of community and social responsibility. It not only provides a platform for surplus food management but also encourages a sustainable approach to food distribution.

Moving forward, the application has the potential to expand its reach and impact by partnering with more organizations and implementing additional features to enhance user experience. By continuing to innovate and adapt to the needs of the community, this application can play a significant role in creating a more food-secure future for all.

Additionally, the surplus and deficient food management application contributes to the overall well-being of the community by promoting a more sustainable food system. By redirecting surplus food from landfills to those in need, the application helps reduce environmental impact and fosters a more circular economy. This aligns

with global efforts to achieve sustainable development goals related to hunger eradication and responsible consumption and production.

Moreover, the application has the potential to create a ripple effect of positive change within the community. By raising awareness about food wastage and hunger issues, it encourages individuals and businesses to adopt more conscious consumption habits. This, in turn, can lead to broader societal shifts towards a more equitable and sustainable future for all.

6.2 FUTURE ENHANCEMENT

For future enhancements, the excess food management application could benefit from more sophisticated algorithms to better match surplus food with recipients. Collaborating with food banks and NGOs could expand the app's reach and effectiveness, ensuring that surplus food reaches those in need more efficiently. Implementing features like user ratings and real-time notifications would enhance user experience, while also improving trust and engagement within the community.

Additionally, integrating food safety compliance measures would reassure users about the quality and safety of the food they donate or receive. Providing analytics and reporting features could offer valuable insights into the impact of the app, encouraging continued participation. A community forum could serve as a platform for users to share tips and discuss ways to reduce food waste and hunger, fostering a sense of community and collective action.

Looking ahead, integrating social media sharing options could amplify the application's impact by allowing users to easily spread awareness of surplus food listings or donation requests. Adding support for multiple languages would enhance accessibility, enabling a wider range of users to participate in the community-driven initiative. Moreover, incorporating gamification elements, such as badges or rewards for active participation, could incentivize users to contribute regularly and further engage with the platform, ultimately fostering a culture of sustainable food management within the community.

APPENDIX

SOURCE CODE:

main.dart

```
import 'package:flutter/material.dart';
import 'package:pree/pages/addFood.dart';
import 'package:pree/pages/demo.dart';
import 'package:pree/pages/login.dart';
import 'package:pree/provider/loginuid.dart';
import 'package:provider/provider.dart';
import 'package:firebase_core/firebase_core.dart';

void main() async{
  WidgetsFlutterBinding.ensureInitialized();
  await Firebase.initializeApp();
  runApp(MultiProvider(
    providers: [
      ChangeNotifierProvider(create: (context) => loginuid(),)
    ],
    child: MaterialApp(
      // debugShowCheckedModeBanner: true,
      home: Center(child: Login()),
    ),
  ));
}
```

apiCall.dart

```
import 'dart:convert';
import 'dart:typed_data';

import 'package:http/http.dart' as http;
import 'package:image_picker/image_picker.dart';
import 'package:pree/provider/loginuid.dart';

class apiCall {
  static var baseurl = "http://192.168.56.1/api/";

  static Future<int> login(String email, String pass, loginuid a) async {
    var url = Uri.parse("${baseurl}donor");

    var jsonData = {"emailId": email, "password": pass};
    try {
      final res = await http.post(url,
          headers: {"Content-Type": "application/json"},
          body: jsonEncode(jsonData));
      if (res.statusCode == 200) {
        var data = jsonDecode(res.body);
        var donorData = data["donor"];
        String organisationName = donorData["organisationName"];
        print(organisationName);
```

```
        a.setUser_org(organisationName);
        a.setUser_name(donorData["name"]);
        a.setId(donorData["_id"]);
        a.setemail(donorData["emailId"]);
        if (donorData["isDonor"])
          a.setRole("1");
        else
          a.setRole("0");
        print(data.runtimeType);
        print(data);
        return 1;
      } else {
        print(res.statusCode);
        print("Failed to connect");
        return 0;
      }
    } catch (e) {
      print("Error: $e");
      return 0;
    }
  }

  static postFood(String email, String fName, String fQuan,String org_name,String loc,) async {
    var url = Uri.parse("${baseurl}addfood");

    final res = await http.post(url, body: {
      "emailId": email,
      "quantity": fQuan,
      "foodName": fName,
      "organisationName": org_name,
      "quantity": fQuan,
      "location": loc,
      "link": "not avail",
      "recv_emailId":"not avail"
      });

    try {
      if (res.statusCode == 201) {
        var data = jsonDecode(res.body.toString());
        print(data);
        return 1;
      } else {
        print("failed to connect");
        return 0;
      }
    } catch (e) {
      print(e.toString());
      return 0;
    }
  }
}
```

addFood.dart

```
import 'package:flutter/material.dart';
class AddFood extends StatefulWidget {
  const AddFood({Key? key}) : super(key: key);

  @override
  State<AddFood> createState() => _AddFoodState();
}

class _AddFoodState extends State<AddFood> {
    final TextEditingController foodNameController = TextEditingController();
  final TextEditingController quantityController = TextEditingController();
  final TextEditingController locationController = TextEditingController();
  @override
  Widget build(BuildContext context) {
    return Consumer<loginuid>(
      builder: (context, val, child) => SizedBox(
          child: Scaffold(
      appBar: AppBar(title: const Text("Add Food")),
      body: Padding(
        padding: EdgeInsets.all(16.0),
        child: ListView(
          children: [
            TextFormField(
              controller: foodNameController,
              decoration: const InputDecoration(
                labelText: "Food Name :",
              ),
            ),
            SizedBox(height: 16.0),
            TextFormField(
              controller: quantityController,
              decoration: const InputDecoration(
                labelText: "Quantity :",
              ),
            ),
            SizedBox(height: 16.0),
            TextFormField(
              controller: locationController,
              decoration: const InputDecoration(
                labelText: "Location :",
              ),
            ),
            SizedBox(height: 16.0),
            ElevatedButton(
              onPressed: () async{
                int flag =await
apiCall.postFood(val.email,foodNameController.text,quantityController.text,val.User_Org,locationCo
ntroller.text);
                if(flag==1){
                  final snackBar = SnackBar(
            content: Text('Food added Successfully'),
            action: SnackBarAction(
              label: 'Close',
```

```
            onPressed: () {
              // Some code to undo the change.
            },
          ),
        );
        ScaffoldMessenger.of(context).showSnackBar(snackBar);
             }
             else{
               final snackBar = SnackBar(
          content: Text('Error while adding food'),
          action: SnackBarAction(
            label: 'Close',
            onPressed: () {
            },
          ),
        );
        ScaffoldMessenger.of(context).showSnackBar(snackBar);
             }
            },
            child: Text("Post"),
          ),
         ],
       ),
     ),
   )));
  }
}
```

Backend:

```
const express = require('express');
const router = express.Router();
const AddFood = require('../models/Addfood');
router.post('/addfood', async (req, res) => {
  const { foodName, emailId, organisationName, quantity, location, link, foodstatus, recv_emailId } =
req.body;
  console.log(foodName);
  try {
    const newFoodItem = new AddFood({
      foodName,
      emailId,
      organisationName,
      quantity,
      location,
      link,
      foodstatus,
      recv_emailId
    });

    await newFoodItem.save();

    res.status(201).json({ message: 'Food item added successfully' });

  } catch (error) {
```

```
    console.error('Error adding food item:', error);
    res.status(500).json({ message: 'Internal server error' });
  }
});
router.post('/changestatus', async (req, res) => {
  const { orderId, newStatus } = req.body;

  try {

    const foodItem = await AddFood.findOne({ orderId });

    if (!foodItem) {
      return res.status(404).json({ message: 'Food item not found' });
    }


    foodItem.foodstatus = newStatus;
    await foodItem.save();

    res.status(200).json({ message: 'Food status changed successfully' });
  } catch (error) {
    console.error('Error changing food status:', error);
    res.status(500).json({ message: 'Internal server error' });
  }
});
router.post('/fooditems', async (req, res) => {
  try {
    const foodItems = await AddFood.find();
    res.status(200).json({ foodItems });
  } catch (error) {
    console.error('Error fetching food items:', error);
    res.status(500).json({ message: 'Internal server error' });
  }
});
router.post('/fooditems/:id', async (req, res) => {
  const foodItemId = req.params.id;

  try {
    const deletedFoodItem = await AddFood.findByIdAndDelete(foodItemId);

    if (!deletedFoodItem) {
      return res.status(404).json({ message: 'Food item not found' });
    }

    res.status(200).json({ message: 'Food item deleted successfully' });
  } catch (error) {
    console.error('Error deleting food item:', error);
    res.status(500).json({ message: 'Internal server error' });
  }
});
module.exports = router;
```

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