

Article

A Mobile Application to Facilitate Meal Box Sharing in Corporate Environments Using Cloud Infrastructure

Priya Tushar Mohod ^{1,*}, Richard I. Otuka ^{1,*} , Nemitari Ajienka ¹, Isibor Kennedy Ihianle ¹ 
and Augustine O. Nwajana ^{2,*} 

¹ Department of Computer Science, Nottingham Trent University, Nottingham NG1 4FQ, UK; priya.dhivar2022@my.ntu.ac.uk (P.T.M.); nemitari.ajienka@ntu.ac.uk (N.A.); isibor.ihianle@ntu.ac.uk (I.K.I.)
² School of Engineering, Medway Campus, University of Greenwich, Gillingham ME4 4TB, UK
* Correspondence: richard.otuka@ntu.ac.uk (R.I.O.); a.o.nwajana@greenwich.ac.uk (A.O.N.)

Abstract: Food waste is a pressing global issue, particularly in urban settings, where substantial amounts of surplus food go unused. In corporate environments, this challenge is compounded by the lack of dedicated platforms to facilitate food sharing and reduce waste effectively. This paper examines the current landscape of food waste, existing solutions, and the need for a specialised platform aimed at corporate employees. The proposed solution is the creation of a user-friendly application that enables the sharing of untouched homemade meals. Suppliers can post their meal boxes with details such as location, type of food, and availability status, while consumers can search for and select meal boxes based on their preferences. This paper addresses the gap in solutions for reducing food waste within corporate environments. The meal-box-sharing app provides a practical and sustainable method for minimising food waste and promoting productivity, health, and safety in the workplace.

Keywords: mobile application; food waste reduction; software development; sustainable food systems; digital food redistribution



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1. Introduction

Food waste remains a significant global issue, with approximately one-third of produced food being discarded. This problem is multifaceted, occurring at different stages throughout the food supply chain, from production to consumption. Beyond the economic costs, food waste has serious environmental and social repercussions, such as contributing to greenhouse gas emissions and exacerbating food insecurity [1]. As a result, numerous studies have explored potential solutions to address this issue globally; however, most of them have focused on a community-based approach and neglected the issue of healthy meals in the corporate environment, which this paper aims to address [2–4]. Based on research conducted in India, referenced in the 2021 United Nations Environment Program (UNEP) report (2021 United Nations Environment Program (UNEP) Report, accessed 2 October 2024), it was found that approximately 50 kilograms of food is wasted per person each year in India, resulting in a staggering 68,760,163 metric tons of household food waste annually [5]. The Brihanmumbai Municipal Corporation’s (BMC) Environment Status Report 2020–21 (Brihanmumbai Municipal Corporation Report, accessed 2 October 2024) highlights that food waste constitutes 72.6% of the total solid waste generated in Mumbai, which ranges from 6500 to 6800 metric tons daily. This means that nearly 75% of the waste collected and disposed of in the previous fiscal year consisted of food waste. To combat this issue, the “Save Food, Share Food, Share Joy” campaign was launched by the Indian Food Sharing Alliance (IFSA), a platform under the Food Safety and Standards Authority of India (FSSAI) (Indian Food Sharing Alliance, (IFSA), accessed 2 October 2024). This initiative collaborates with various stakeholders across the supply chain and household sectors. In contrast, countries like the United States and France have adopted a “Prevention,

Recovery, and Recycling” approach to reducing food waste [6]. Prevention involves reducing excess food generation by encouraging consumers to purchase only what they need, thus minimising waste. Recovery focuses on redistributing surplus food to food banks, shelters, and other organisations for human consumption. Recycling involves repurposing excess food for non-human uses, such as feeding animals or converting it into compost or energy [6–8].

The Leftoverswap initiative has gained significant traction across cities in the United States, including New York and San Francisco, as well as in Europe, Australia, and Asia, with a user base of approximately 10,000 [9,10]. Initially, Leftoverswap allowed individuals to post online when they had excess food at home to donate. This concept has since expanded to include restaurants, bakeries, and shops [11,12]. A study conducted in Delhi, India, revealed the limited availability and accessibility of healthy food options in work environments. Most participants reported consuming unhealthy foods such as fast food, oily meals, and snacks at work. The study also found that poor workplace food environments were associated with an increased risk of cardiometabolic diseases, including high blood pressure and elevated blood glucose levels. The need for homemade food at work is critical [11]. Despite various solutions aimed at reducing food waste and addressing employee dietary needs, the issue of unhealthy food in the workplace persists. In many corporate environments, employees are willing to share their meal boxes with colleagues within their team but are hesitant to do so with those from other teams, floors, buildings, or organisations in the same industrial estate (IT park). A 2020 Reddit study gathered comments from employees living far from home who struggle with food quality, cost, and availability, particularly low-income earners. These employees often spend INR 250 (GBP 2.5) to INR 350 (GBP 3.5) per day, amounting to INR 7500 (GBP 75) to INR 10,500 (GBP 105) per month, on eating out, without considering the quality of food. When they are unwell, they have no one to care for them, leading to higher costs and mental stress (Reddit, 2023, accessed 2 October 2024). In the rapidly growing IT sector, both the number of employees and the population of single individuals are increasing. However, no platform currently connects employees to share homemade meals or meal boxes within the corporate environment [13]. The proposed platform seeks to tackle the absence of home meal sharing in corporate environments by leveraging a mobile application platform. Mobile applications provide a convenient and accessible way for corporate employees to share meals instantly, fostering collaboration, reducing food waste, and promoting health within the fast-paced workplace. This paper also examines challenges such as limited access to homemade meals in the workplace and proposes a platform to facilitate meal sharing among employees. Building on insights from existing initiatives like Leftoverswap and workplace studies, the contributions of this paper are as follows:

- A comprehensive review of existing food waste reduction initiatives, including digital platforms like Leftoverswap and workplace food environment studies.
- The implementation of a proposed meal-sharing platform aimed at connecting employees within corporate environments to share homemade meals.
- A detailed analysis of the system’s potential impact on reducing food waste, improving workplace nutrition, and fostering community engagement among employees.

This paper is organised into several sections. Section 2 provides an overview of related work, followed by Section 3, which outlines the Proposed Solution and Methodology. Section 4 details the Application Implementation, Section 5 covers User Evaluation and Discussion, and Section 6 concludes the paper.

2. Related Work

Food waste is an escalating global issue that necessitates interventions across all levels of the food supply chain. In developed countries, household food waste has emerged as a critical area requiring targeted efforts. Factors contributing to household food waste include consumer misunderstandings of expiration dates and the impact of shelf life on food durability. While preservatives have traditionally been used to extend shelf life, the growing preference

for “clean labels” has driven the need for innovative solutions that not only preserve food but also manage inventory efficiently. New technologies, particularly mobile applications, offer promising avenues for addressing these challenges by empowering consumers to manage food better, store it more effectively, and make informed purchasing decisions.

Several mobile applications have emerged globally that offer community-based platforms to reduce food waste. Apps such as Olio ([Olio Food App](#)), Too Good To Go ([Too Good To Go App](#)), Karma ([Karma App](#)), NoWaste ([NoWaste App](#)), Nosh ([Nosh App](#)), FoodCloud ([FoodCloud App](#)), and Kitche ([Oddobox](#)) have provided digital solutions aimed at minimising food waste by facilitating the sharing of surplus food. For instance, the Karma app, with its 1.4 million users across 225 cities, has prevented the waste of over 4 million meals and saved 1800 tons of CO₂ emissions, underscoring its impact on both waste reduction and environmental sustainability [14]. Similarly, by 2017, FoodCloud had enabled the donation of 2528 tons of food to over 1,100 charities in the UK and Ireland, further demonstrating the significant role digital platforms play in food redistribution. A Team 2018 newsletter ([Team 2018 Newsletter](#), accessed 3 October 2024) discussed the drawbacks of having an office canteen. While office canteens offer convenient food access, they often provide unhealthy options, contributing to poor employee health. The cost of food in canteens can also be high, especially for low-income employees. Social pressures related to eating habits and norms, along with the increase in food waste and environmental impact, are additional concerns. The article suggests weighing these drawbacks before introducing a canteen in the workplace.

Another approach highlighted by Sharma et al. [15] and Shokeen et al. [16] focuses on the conversion of food and kitchen waste into value-added products. These studies emphasise that food waste, rich in organic carbon, could be repurposed to produce various chemicals and high-value compounds. However, the diverse composition of food waste poses a challenge in developing efficient technologies for this conversion. In parallel with these developments, a shift towards food-sharing apps is evident. Researchers have explored various mobile applications, like Fridge Pal, LeftoverSwap, and EatChaFood, which aim to reduce household food waste by increasing awareness of local food availability, literacy, and location. These platforms empower users to share surplus food, increasing personal responsibility over food waste [17]. OLIO, one of the most popular food-sharing platforms, has demonstrated significant reductions in food waste in the UK by rethinking traditional supply chain roles and encouraging peer-to-peer food exchanges. As the number of individuals facing “in-work” poverty grows, food-sharing apps also provide a vital resource for those turning to food banks to meet their needs [18].

The rise in smartphone usage has further enabled the development of food-sharing technologies, as apps now offer a convenient way to connect large numbers of people globally [19]. Smartphone apps have gained popularity, allowing businesses and individuals alike to manage food surpluses and redistribute them to those in need. However, current platforms like Olio and Karma, while effective, lack certain features such as donation tracking. Ensuring that donors are informed of where their food donations go can further enhance transparency and user engagement, addressing a gap that still exists in these applications [20]. A review of popular apps is presented below:

OLIO is a mobile application designed to reduce food waste by connecting users with surplus food from local households and businesses. The app allows both individuals and organisations to share food items that are still safe for consumption, preventing them from being wasted. Users can post available food items, browse listings, request what they need, and arrange for pickups. OLIO promotes sustainability by encouraging food sharing and reducing the environmental footprint of food waste, fostering a stronger sense of community in the process [21].

The Too Good To Go app tackles food waste by partnering with restaurants, cafes, bakeries, and grocery stores that have surplus food at the end of each day. Through the app, users can purchase these food items at discounted prices, preventing waste while saving money. The app’s easy-to-use interface and global reach make it a popular tool for promoting sustainability and responsible food consumption [22].

Karma is a mobile app focused on reducing food waste by connecting users with surplus food from restaurants, cafes, and grocery stores. It allows food establishments to sell their excess food at discounted prices to the app's user base. Users can browse available items in their area, such as unsold meals, pastries, and other perishable goods, and purchase them at reduced rates. The app helps prevent food waste by making these items accessible to consumers [23].

FoodCloud is a food-sharing platform based in India and is designed to facilitate the donation of surplus food. The app allows food donors to list excess food items they wish to give away, while beneficiaries can browse and request the available food. The app operates on a donation-based model, aiming to redistribute food to those in need and reduce waste [24].

NoWaste is an app aimed at helping individuals manage their household food supply and prevent waste. It offers features such as receipt and barcode scanning, grocery tracking, meal planning, and automatic expiration date reminders. While its primary goal is to reduce food waste, NoWaste also enhances household efficiency and organisation [25].

While significant progress has been made through digital platforms to address food waste and hunger, there remain opportunities for improvement in terms of enhancing transparency and ensuring efficient redistribution of surplus food to those in need. Future developments in food-sharing applications must focus on better assessing the suitability of excess food for human consumption and streamlining the donation process to maximise their impact. The mobile application proposed in this work aligns with these existing platforms, as they all propose a solution for reducing food wastage. However, while the platforms reviewed above focused mainly on communities, the proposed solution focuses on the corporate environment and further introduces novel functionality, promoting acceptability, ease of use, and user satisfaction. The mobile application proposed in this work aligns with these existing platforms but introduces novel functionality. Unlike other food-sharing apps, it provides a unique approach that, to the best of our knowledge, has not been previously explored. This app not only targets food redistribution but also addresses broader issues such as hunger, poverty, and healthcare, aligning with several UN Sustainable Development Goals (SDGs) [26]. Furthermore, the app facilitates access to critical knowledge that positively impacts both healthcare and the environment by contributing to the reduction in food waste and hunger. This work spans the domains of technology, health, and sustainability, offering a comprehensive solution to a pressing global issue.

3. Proposed Solution and Methodology

This paper proposes the development of a novel application aimed at reducing food waste through meal sharing among corporate employees. The application will allow users to post advertisements for untouched homemade meals, creating a platform for employees (suppliers) to offer meal boxes to other employees (consumers) within the same or nearby organisations. This approach is unique, as existing platforms primarily focus on community-based sharing, rather than targeting corporate environments. The meal boxes can be offered either free of charge or for a nominal fee, which distinguishes this platform from those discussed in Section 2. This feature allows employees to potentially earn money from sharing meals, with the cost being significantly lower than that of food in office canteens. The app features a user-friendly interface, enabling users to easily search for available meal options based on their location. Suppliers can choose to offer the tiffins for free or at a price that fits their preferences. To ensure safety, data protection, and reliability, the application incorporates a verification process, requiring suppliers to provide a valid office email address for registration. After consuming a meal, employees can rate the food and provide feedback for future users. This innovative approach to addressing food wastage in corporate environments benefits both suppliers and consumers. It reduces food waste, satisfies the needs of those seeking affordable meals, and promotes healthier eating habits among employees.

The methodology adopted for developing the meal-box-sharing app followed the Agile approach, which involves iterative two-week sprints. Each sprint included grooming

and planning sessions to break down tasks, followed by focused development and testing of specific features, such as food listing and communication channels. After development, a two-week testing phase ensured reliability, and sprint reviews were conducted to assess progress and gather feedback for continuous improvement [27].

3.1. System Architecture

Software architecture consists of a set of principles that define how software systems are designed and developed. This framework specifies the structure and organisation of the software system [28,29]. As illustrated in Figure 1, the proposed meal-box-sharing app involves two primary types of users: suppliers and consumers. In both cases, the mobile app connects to the Internet to execute its operations. When prompted, the mobile app sends a request to the server to retrieve real-time data. The server processes this request using the data stored in the database. AWS cloud services (AWS cloud services) are utilised for storing images via the S3 bucket, while Firebase provides real-time chat functionality [30].

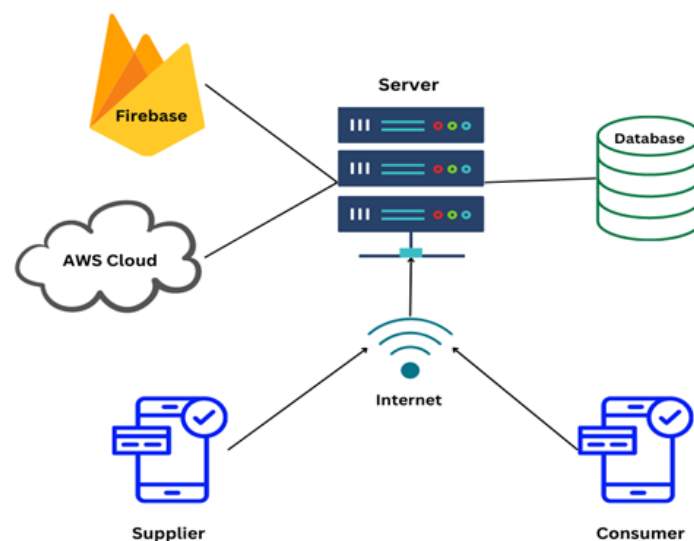


Figure 1. System architecture.

3.2. System Paradigm

A system paradigm is a foundational approach or model that shapes how a system is designed, developed, and operates. It covers the fundamental principles, concepts, and strategies that shape the way a system is conceived, organised, and managed.

Taking system paradigms into consideration, there are two primary key players, suppliers and consumers, as depicted in Figure 2. The supplier is responsible for posting available food, while the consumer has the freedom to request available food. If both parties agree, they can communicate through a channel provided within the app and arrange to meet at a designated meeting point.

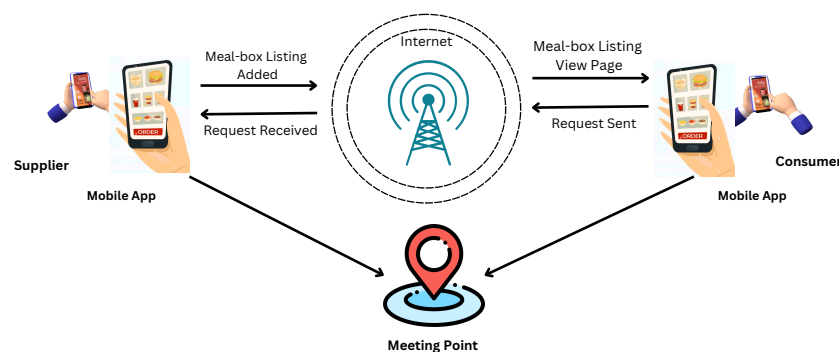


Figure 2. System paradigm.

3.3. System Process Design Diagrams

A use case diagram provides a visual representation of the functional interactions between the different actors (users or systems) and various use cases (functionalities or tasks) of a system [31]. Figure 3 shows the activities performed by the supplier and consumer.

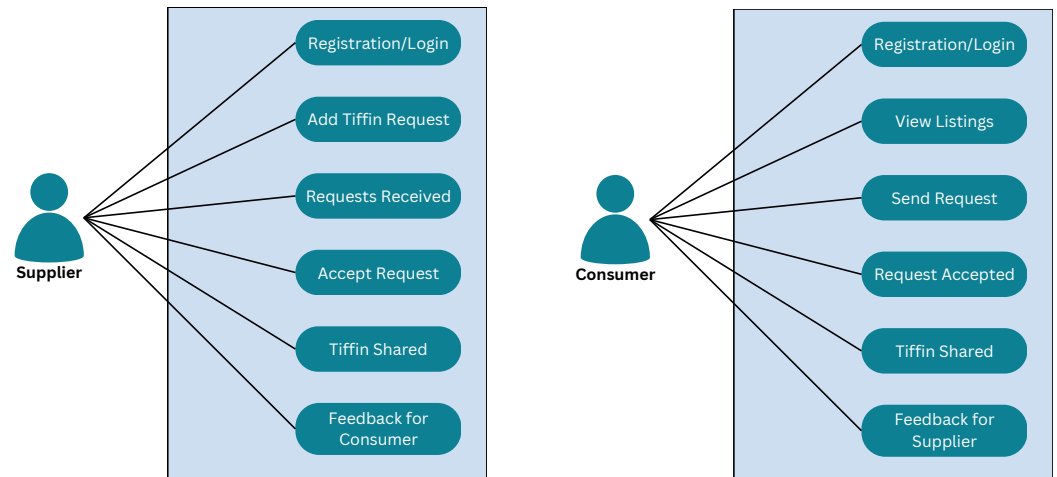


Figure 3. Use case model.

3.4. Flowchart for Application

An application flow diagram outlines the step-by-step sequence of actions and interactions that a user takes within an application. Figure 4 shows the flowchart of application performance.

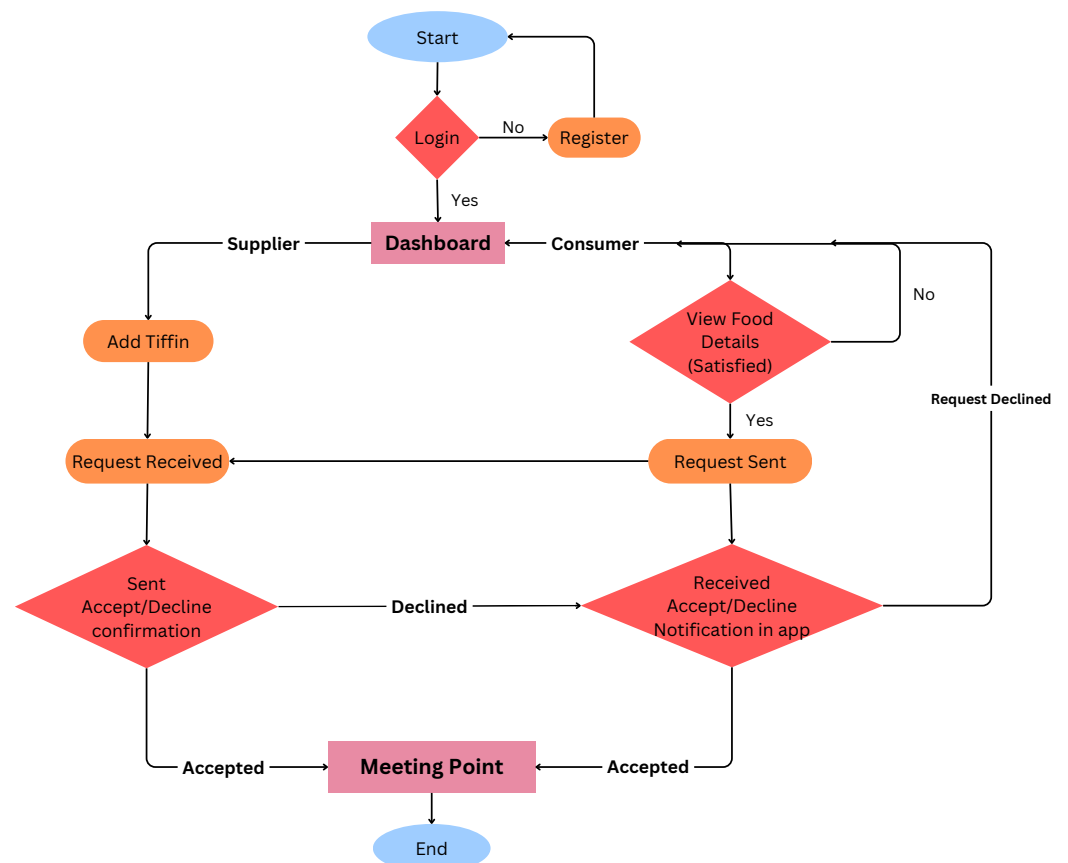


Figure 4. Application flowchart.

3.5. Data Flow Diagram

A data flow diagram (DFD), as shown in Figure 5, provides a visual depiction of the movement of data within a system or process. Presented within it are the data flow, the operations that manipulate and shape the data, the repositories housing the data, and the external entities engaging with the system.

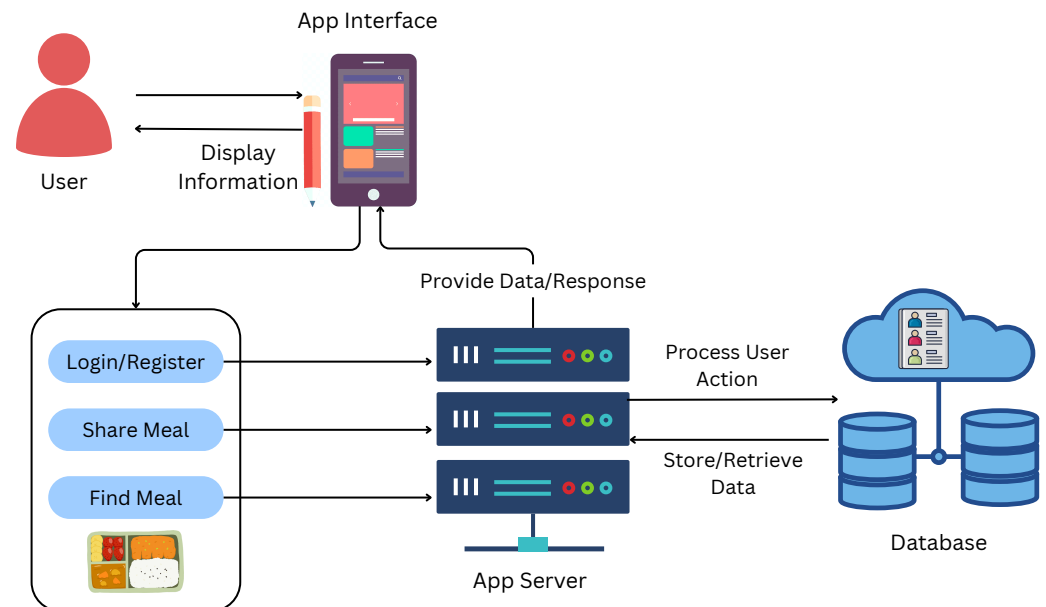


Figure 5. Data flow diagram.

4. Application Implementation

The proposed application has been developed using the Flutter framework (Flutter framework) for mobile app development, the Spring Boot framework (Spring Boot framework) for backend API creation, and MySQL as a database. Additionally, AWS cloud services are utilised for storing and retrieving images and data. The coding is implemented using Dart for mobile app development and Java for backend service creation, based on the applied frameworks. Below is a detailed overview of the core components:

Flutter Framework for Mobile App Development: Flutter, an open-source UI toolkit developed by Google, enables the creation of natively compiled applications for mobile, web, and desktop use from a single codebase [32]. Its adoption allows the development of a responsive and high-performance mobile app using a single Dart codebase, saving significant time and resources compared to building separate apps for iOS and Android [33,34]. Flutter's extensive widget library facilitates the creation of highly customisable and visually appealing user interfaces, making it an ideal choice for this project.

Spring Boot Framework for Backend API Creation: Spring Boot, a popular Java-based framework, simplifies the development of robust and scalable backend systems. With features such as dependency injection, embedded servers, and simplified configurations, it streamlines the setup of REST APIs [35]. The strong ecosystem of Spring Boot, combined with its compatibility with various databases and cloud services, ensures the creation of secure, high-performance backend services.

MySQL for Database Management: MySQL is a widely used relational database management system that provides efficient data storage, retrieval, and querying capabilities [36]. Its compatibility with Spring Boot allows seamless integration with the backend. MySQL's scalability and extensive community support further enhance its reliability, making it a practical choice for managing the application's database requirements [37].

AWS Cloud Services for Storage and Retrieval: AWS offers a suite of cloud-based tools for securely storing, retrieving, and processing images and data. The application uses AWS S3 for scalable image storage and RDS for database management, ensuring high

availability and reliable performance. AWS's built-in security features and compliance measures provide an added layer of trust for handling sensitive data [38].

Each of these technologies was carefully chosen to meet the application's requirements for performance, reliability, and user experience, creating a strong foundation for both frontend and backend development.

Application Screens

Splash Screen: Upon launching the application, it displays a splash screen for two seconds and then shows the login page. To enable this in the Flutter framework's code, a "flutter_native_splash.yaml" file needs to be configured. This is depicted in Figure 6 screen 1.

Login Page: A login display provides the option for users to add their email and password. If the user is not already a member of the app, then the user must register first. A "Join here" selection will display on the registration screen. This is depicted in Figure 6 screen 2.

Register Page: To access the mobile application, users must first register using the fields displayed in the below figures and using their corporate email as a security measure. Also, the user must confirm the terms and conditions of usage. To implement maps in the application, we have adopted the "google_maps_flutter" dependency.

OTP Verification as a security measure: When a user fills in all data on the registration page, a one-time password will be generated and sent to the registered email ID. By providing the received OTP, the user can log in successfully. To implement OTP verification in Spring Boot, the "springbootstartermail" dependency was adopted. This is depicted in Figure 6 screen 3.

Dashboard Screen: The dashboard screen lists all the food items added by users (suppliers). It also features a filter, a side drawer, and a bottom navigation bar, allowing users to access other pages. Users can add food items to the list using the "Add" button function. This is depicted in Figure 6 screen 4.

Add Food Page: On the "Add Food" page, users can input details such as name, description, quantity, food type, available time, presence of allergic content, applicable charges, and location. Additionally, if an error occurs, a pop-up will be displayed. This is depicted in Figure 6 screen 5 and 6.

Food Details Page: On the Food Details page, consumers can see all the information the supplier provided while adding the food and can request a particular food. Additionally, on the details page, users can view allergy information in the designated section.

My Listing and My Request Pages: On the "My Listings" and "My Requests" pages, suppliers can review, accept, or decline the received requests. Similarly, consumers can view their submitted requests and check their status to confirm whether they have been accepted or not. *My Listings:* On the "My Listing" page, suppliers can manage the meal boxes they have shared. *My Request:* On the "My Request" page, consumers can track the status of their meal box requests.

Communication Window: When a user clicks on the message icon on the My Request page and on a user's name on the My Listing page, a communication window will open, allowing both the supplier and the consumer to communicate with each other. This communication function was implemented using "Firebase Cloud Firestore". This is depicted in Figure 6 screen 7 and 8.

Side Drawer The side drawer slides in from the right side of the screen and contains navigation options, like menu listings, requests, profiles, logout options, and additional content.

Update Profile and Public Profile Pages: The "My Profile" page allows users to manage and modify their account information and preferences within the app. This page empowers users to keep their profiles accurate and up to date. Users can update their profile picture, name, contact details, and location. Upon clicking the "View Public Profile" button, users can preview how their profile appears to the public. The "Public Profile" will showcase the user's name, profile picture, reviews, ratings, joining details (date and time),

and verification status. Additionally, as part of future enhancements, it will also display the list of foods added by this user.

AWS S3 Bucket: Amazon Simple Storage Service (Amazon S3) is a cloud-based storage service provided by Amazon Web Services (AWS). It offers scalable and durable storage for various types of data, such as documents, images, videos, backups, and more. S3 buckets, the core component of S3, are used to store and organise objects. For this application, we have adopted an S3 service to store all images.

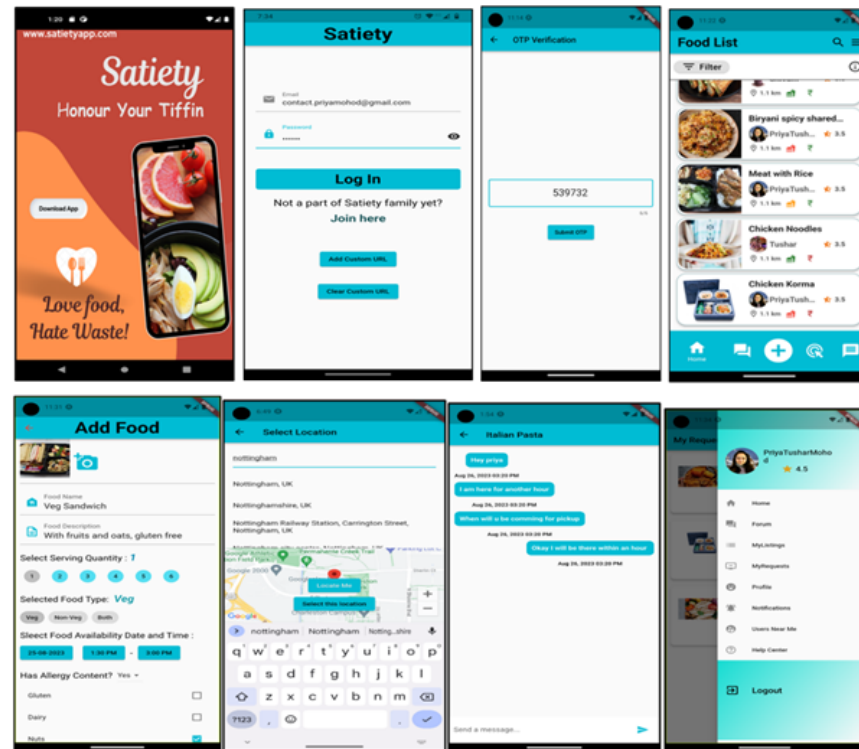


Figure 6. Application screens.

5. User Evaluation and Discussion

To assess the application's user experience and gather diverse perspectives, a Google Forms questionnaire was developed and distributed to 100 potential users from various corporate organisations across multiple locations. The selected participants, representing a mix of professions, genders, and geographic regions, were tasked with installing and testing the application for a defined period. Out of the 100 users invited, 40 participants completed the questionnaire, providing a response rate of 40%. The questionnaire was designed to capture feedback on five key aspects of the application: ease of use, fit for purpose, navigation, user-friendly interface, and functionality, alongside overall satisfaction. The responses were further analysed based on location, gender, and occupational demographics to identify trends and disparities in user experiences. Table 1 presents an overview of the respondents by location, gender, and occupation. Participants were drawn from Canada, England, Nigeria, and India, with female respondents (62.5%) outnumbering males (37.5%). The occupational representation, as presented in Table 2, included finance, manufacturing, marketing, construction, technology, and other fields, providing a holistic perspective of user experiences.

Table 1. Respondents by location and gender.

Location	No. of Respondents	Gender (M)	Gender (F)	Percentage (R)
Canada	3	0	3	7.5%
England	19	7	12	47.5%
Nigeria	7	4	3	17.5%
India	11	4	7	27.5%
Total	40	15	25	100%

Table 2. Respondents by occupation and gender.

Occupation	Male	Female	Percentage (R)
Finance	4	7	27.5%
Manufacturing	2	3	12.5%
Marketing	2	6	20.0%
Construction	1	0	2.5%
Technology	3	8	27.5%
Others	3	1	1.0%

The feedback results, as summarised in Table 3, reveal a strong overall user satisfaction with most aspects of the application. All 40 respondents agreed that the application was easy to use, highlighting the success of its intuitive interface design. All the participants affirmed that the application was fit for its intended purpose, demonstrating that its features effectively met user expectations. Navigation received overwhelmingly positive feedback, with 39 respondents expressing satisfaction. However, one participant noted minor usability issues, pointing to areas that could be refined for a more seamless experience. Similarly, all respondents appreciated the effectiveness of its layout and design aesthetics. In terms of functionality, 37 users were satisfied with the application's performance, while three respondents highlighted specific areas requiring improvement. These included occasional delays in page loading and limitations in certain features. Overall satisfaction was reported by 36 participants, while four suggested enhancements to improve their experience.

Table 3. Feedback by location and category.

Feedback	Canada			England			Nigeria			India		
	Y	Maybe	N	Y	Maybe	N	Y	Maybe	N	Y	Maybe	N
Ease of use	3	-	-	19	-	-	7	-	-	11	-	-
Fit for purpose	3	-	-	19	-	-	7	-	-	11	-	-
Navigation	3	-	-	17	1	1	6	1	-	10	1	-
User-friendly interface	3	-	-	19	-	-	7	-	-	10	1	-
Functionality	2	-	1	18	1	-	6	1	-	10	-	1
Overall satisfaction	2	-	1	17	1	1	7	-	-	9	-	2

The evaluation revealed key strengths of the application, particularly its ease of use and user-friendly interface. Nevertheless, certain areas, such as functionality and overall satisfaction, were identified as opportunities for refinement. Specific recommendations provided by users include the following:

- Improved Page Loading Times: Enhancing the app's responsiveness to reduce delays during peak usage.
- Notification Alerts: Implementing real-time alerts for meal box availability within a defined radius.
- Language Selection Options: Expanding accessibility by supporting multiple languages.
- Advanced Meal Scheduling: Adding functionality for users to plan and schedule meals more effectively.

These recommendations will be prioritised in future iterations to enhance the application's usability and broaden its appeal across diverse user groups.

6. Conclusions

The proposed application was developed to address the critical issue of food wastage within corporate organisations, a pressing global concern highlighted by numerous researchers and organisations. While existing solutions, as shown in Table 4, effectively facilitate food sharing for general households and retail businesses based on parameters like food type, location, and expiry date, they lack focus on corporate settings. Apps such as OLIO and Too Good To Go target broader demographics, leaving a gap in addressing the specific needs of corporate employees who may wish to share homemade, nutritious meals. The proposed application fills that gap by providing a tailored platform for corporate employees to share surplus food with colleagues, offering a cost-effective alternative to expensive or less healthy cafeteria options. It prioritises critical factors such as location, food type, security, hygiene, corporate identity, and cost savings. The high acceptance rate of 88.9% among respondents underscores the significance of this solution. Features like cultural considerations, localised language support, and meal scheduling cater specifically to the diverse needs of corporate users, enhancing its appeal and usability compared to more generalised food-sharing applications. However, the implementation presents some challenges, such as food safety concerns and legal liability. Questions may arise about responsibility if someone falls ill from a shared meal, and employees might hesitate to trust the safety and quality of food prepared by colleagues. Varying levels of adherence to hygiene practices could also increase the risk of contamination or foodborne illnesses. Future work could address these challenges and focus on further enhancing the application. This includes integrating localisation and cultural customisation, meal scheduling, and AI-driven algorithms for recommending meal matches based on user preferences, dietary restrictions, and proximity. Additionally, incorporating feedback and rating systems could enhance trust and accountability while fostering continuous improvement. These developments would not only mitigate potential risks but also ensure the app's scalability, effectiveness, and long-term impact on reducing food waste and promoting sustainability in corporate environments.

Table 4. Similar applications/solutions and their limitation.

Name	Strengths	Limitations
OLIO	- Easy-to-use interface - Wide range of food categories - Available in multiple countries	- Limited availability in certain areas - Not focused on corporate environment - No option to charge for food
Too Good To Go	- Large network of participating restaurants and bakeries - Allows users to purchase discounted meals - Reduces food waste from businesses	- Only available in select cities - Limited food selection - No option to donate food to individuals - Not specific to corporate environment
Karma	- Empowers users to save surplus food from different eateries and wholesalers - Provides users with a clear view of purchasable meals at each eatery	- Limited to only restaurants, bakeries, cafes, and wholesalers - Does not address food waste from households or other sources outside of these businesses - Not specific to a corporate environment
FoodCloud	- Links grocery stores with charities and community groups to donate extra food - FoodCloud's technology enables various food businesses to donate their surplus food - Donated food is distributed to charities the next day	- Limited to the UK and Ireland - Does not address food waste from households or other sources outside of these businesses - Not specific to corporate environment
NoWaste	- Helps users prevent food waste in their homes - Enables users to scan receipts and barcodes, track weekly shopping, create inventory lists, plan meals better, and receive expiry alerts - Enhances time, cost, and mental effort savings for users handling their household food	- Limited to households and does not address food waste from businesses or other sources outside of households

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