

# Food-For-All: A Food Donation Management System

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## Abstract

Food insecurity and hunger are major issues in Malaysia, especially for the B40 community who often struggle to get enough food. These problems also worsen during disasters like floods or pandemics, which disrupt food supply chains. NGOs help by collecting and distributing food, but they face difficulties such as managing overstock and shortages, tracking expiration dates manually, and recording donor information using paper forms. To solve these problems, the “Food-For-All: A Food Donation Management System” was developed. This system offers a mobile-view web platform for donors and a web-based platform for NGOs. It was built using the Waterfall model and tested through both alpha and beta testing phases. It is expected to allow donor view the items needed, submit online donation forms, and can view the updates when their donations are distributed. The system also automates the monitoring of expiration dates and creates reports for each donation program.

## 1. Introduction

Food Bank Malaysia, like other food donation organization, faces several challenges that impact its efficiency and ability to serve the community effectively. One major issue is managing both overstock and shortages food items. Donors often give similar items, like rice or flour, due to a lack of information on what is needed. This leads to shortages of other essential foods such as powdered milk and protein-rich foods. This imbalance can lead to waste and it limits the food bank’s ability to meet the full range of community needs.

Another issue is manually tracking of food expiration dates. Staff manually record and check expiration dates using Excel. This process is slow, prone to mistakes, and hard to manage as donations grow, leading to expired items being wasted. Next, managing donor information is also inefficient. Donors fill out paper forms that are sorted, stored, and later entered into a database manually. This process is time-consuming and increases the risk of lost or mishandled records, which could harm the NGO’s reputation and data security.

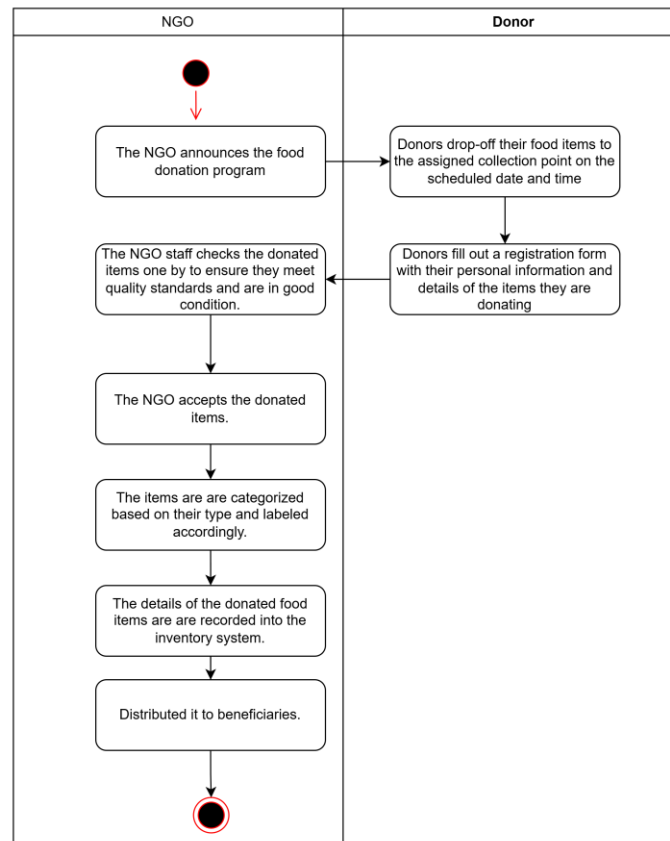
Thus, the new Food-For-All System will solve these problems. Donors will see exactly what items are needed, reducing waste and shortages. The system will track expiration dates and alert staff, ensuring timely removal of expired items. It will also provide an online form for donors, creating a secure and efficient digital database to simplify the donation process.

## 2. Related Work

This section provides an overview of the study's domain background, introduces related terms and concepts such as Food Donation and Donation Management, and examines comparisons with existing related systems.

## 2.1 Domain Background of the Case Study

This study focuses on improving existing food donation management for NGOs in Malaysia, addressing hunger and emergencies like pandemics or floods. Organizations like Food Bank Malaysia collect food items from donors and redistribute it to people needed.



**Fig. 1** As-Is diagram for the current process

Based on the flowchart in Figure 1, the food donation management system is currently handled manually and inefficient. The process begins with the NGO announcing the food donation program on social media platforms like Facebook, Instagram, and WhatsApp to inform the public and encourage donations. The announcement includes details such as the program's purpose, activities, venue, date, and time. Donors then drop off their food items at a designated collection point at the scheduled time and date, completing a manual registration form on paper, providing their personal details and a list of the items they are donating. Next, staff check each donated item to ensure it meets quality standards and is in good condition. Then, they are categorized by type such as dry food, canned goods, perishables, labeled accordingly, and recorded in the NGO's inventory system for tracking. After sorting, the donated food is distributed to beneficiaries, including food banks, community centers, or directly to those in need. This completes the donation process, ensuring the food reaches those who need it most.

## 2.2 Food Donation

Food donation involves providing surplus food, or donors may purchase items specifically for donation purposes and give them to individuals or charitable organizations in need [1]. Donations can include non-perishable items like canned goods, dried foods, and packaged meals, as well as fresh produce and cooked meals that are still safe to consume. These contributions are facilitated through government organizations, non-governmental organizations (NGOs), or directly to vulnerable communities and regions affected by crises. Digital platforms, such as websites and mobile applications, play a significant role in streamlining the donation process by connecting donors with nearby food banks, shelters, or social institutions that accept food donations. Efficient management of food donation systems is essential to ensure the smooth collection, storage, and equitable distribution of donated food to those.

### 2.3 Donation Management System

Donation management systems are software tools that help nonprofits and charities efficiently handle the donation process. They allow organizations to track and manage donations, maintain donor relationships, and improve fundraising efforts. Key features include Donor Database Management, which stores donor information like contact details and giving history, enabling personalized communication. Event Management tools support planning and managing fundraising events, while Reporting and Analytics provide insights into donor trends and campaign performance. These systems simplify fundraising, enhance efficiency, and allow organizations to focus on their mission [2]. By using these systems, nonprofits can better engage their supporters, increase transparency, and build long-term trust with donors. Additionally, automated workflows and data centralization reduce manual tasks and human error, allowing teams to work more effectively and make informed decisions that drive greater impact.

### 2.4 Comparison with the Existing System

Based on comparisons made between the existing systems, there are certain similarities and differences in the features of these systems. The study's finding is used as a guide for developing an online food donation management system. The finding from the comparison of the system's features is shown in Table 1.

**Table 1** System's Comparison

Features	BankTheFood	MealConnect	Food Rescue US	Food-For-All
Registration User Account	✓	✓	✓	✓
Login	✓	✓	✓	✓
Manage Program Categories	✗	✗	✓	✓
Manage Food Categories	✗	✓	✓	✓
Assign Needed Items by Event.	✗	✗	✗	✓
Real-Time Donation Tracking	✗	✗	✗	✓
Map-Based Donation Events	✗	✗	✗	✓
Automated Tracking of Food Item Expiration Dates	✗	✗	✗	✓
Generate Report	✗	✗	✗	✓
View Post-Program Updates	✗	✗	✗	✓
Manage User Profile	✗	✗	✓	✓

## 3. Methodology/Framework

A software process model is a framework used in software engineering to organize development work into distinct phases, facilitating better design, product management, and project management. It is commonly known as the Software Development Life Cycle (SDLC) [3].

### 3.1 Waterfall model

The Waterfall Model for Food-For-All focuses on outlining the system before building its final version. This approach follows a structured methodology where each stage of the process must be completed before progressing to the next. Waterfall is well-suited for projects with clear and fixed objectives. However, it is less effective for complex projects or those with changing requirements, making it more appropriate for short-term projects with stable and well-defined criteria [4].

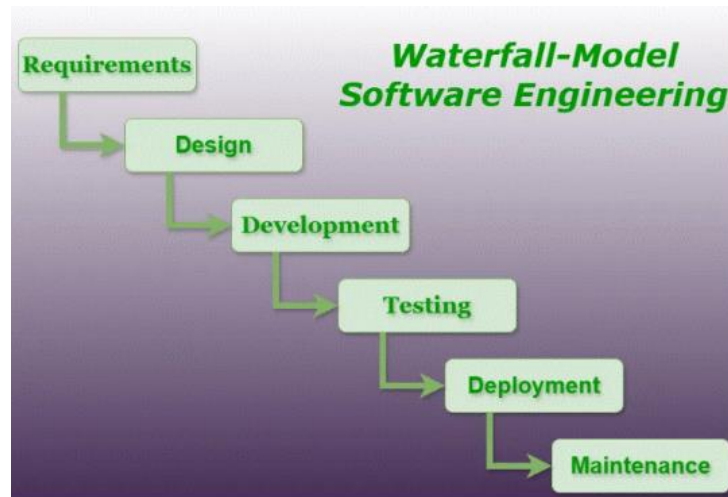


Fig. 2 Waterfall Model [5]

### 3.2 Requirements Gathering Phase

In the requirement analysis phase, data related to the proposed system is gathered and analysed to determine the system requirements outlined by users. First, an analysis strategy is created by researching the existing food donation management system used by an NGO actively involved in food donation programs. This helps identify the problems in the current system, which then guides the creation of a better and more efficient system design. At the same time, a questionnaire was created using Google Forms for the relevant NGO and food donors to gather their familiarity with and opinions on the existing donation system, providing valuable insights for the development of the Food-For-All system.

### 3.3 Design Phase

The design phase transforms the data collected during the requirement analysis phase into design specifications. The issues identified during the requirement analysis phase are addressed through the logical design. Additionally, an overview of the system's user interface design is provided during this phase. A prototype of the interface is created to assist with the implementation in the next phase. Design tools such as Canva are used to develop the Graphical User Interface (GUI). In addition, database design involves creating a data model to define entities, attributes, and data storage methods. Behavioural diagrams in Unified Modelling Language (UML), such as Use Case diagrams, Sequence diagrams, and Activity diagrams, are also part of this phase. Tools like draw.io are used to create these related diagrams.

### 3.4 Development Phase

The development phase involves translating the design specifications into a functional system. In the mobile view for the donor module, features such as registration, making food donations, viewing donation status, and accessing location-based services using the Geolocation API are integrated. At the same time, the admin module is designed for web access, providing functionalities for managing donations, viewing reports, and handling the inventory system. Both modules are developed using the same set of language which are HTML, CSS, JavaScript.

### 3.5 Testing Phase

This process ensures the application's performance is optimized before being introduced to users. The system undergoes thorough testing to confirm it meets project requirements and delivers the expected outcomes. Alpha testing, also known as functional testing, is conducted to verify that the application operates as intended. During this phase, each module of the application is tested individually based on a predefined test plan. This plan outlines the expected results for various test scenarios, aiming to detect and resolve any issues within the system. Then, beta testing is performed to validate that the application meets user requirements. The testing process continues until all project objectives are met, ensuring every module functions effectively and the implemented data is accurate.

### 3.6 Deployment Phase

The deployment phase marks the final stage of the development lifecycle, during which the application is prepared, tested, and made available to users. The primary goal is to ensure a seamless and successful launch of the application into the production environment, confirming its readiness for user access. This phase includes the critical step of uploading the finalized application to production servers or app distribution platforms, such as the Google Play Store or Apple App Store. App Store Deployment Tools streamline this process by ensuring adherence to platform-specific guidelines and facilitating a smooth deployment experience for users accessing these platforms.

### 3.7 Maintenance Phase

The review phase reflects the core principles of iterative software development, emphasizing continuous evaluation and refinement of the application. This stage involves gathering user feedback to understand their experience, monitoring the application's performance to identify potential issues, and applying updates or enhancements based on these insights. Techniques such as user surveys, interviews, and analytics tools are integral to this phase, providing valuable data to inform decisions. By fostering an ongoing cycle of feedback and improvement, the Review Phase ensures that the application remains responsive to user needs, adaptable to changes, and continuously evolves to deliver an optimal user experience.

## 4. Result and Discussion

This section outlines the result and discussion for developing the Food-For-All System. 4.1 presents the system requirements analysis. Section 4.2 shows the system analysis which contains use case diagram, use case, class diagram and design interface of the system.

### 4.1 System Requirements Analysis

This section outlines the analysis and design process for developing the Food-For-All System. It provides an overview of the system development workflow, details the functional requirement that shown in Table 2 and non-functional requirements shown in Table 3. This section also elaborates on the system analysis and system design.

**Table 2** *Functional Requirement Analysis*

No	Modules	Functionalities
1	Register User Account	The system shall allow donors to register by providing their personal information, including email, first name, last name, address, phone number password and confirmation password.
2	Login	The system shall allow authorized admins and donors to log in using their valid email and password to access the system.
3	Manage Program Categories	The system shall allow admins to manage program categories, such as general donations and urgent donations, by adding, updating, and deleting category details. This helps admins assign a category to each program created.
4	Manage Food Categories	The system shall allow admins to manage food categories, by adding, updating, and deleting category details. This helps donors assign a category to each food item donated.
5	Manage Donation Program	The system shall allow admins to manage donation programs by adding, viewing, updating, and deleting program details. The system shall display the donation program details on donor's homepage. Then, allow donors to make a donation by filling out a donation details form.

**Table 2** *Functional Requirement Analysis (cont)*

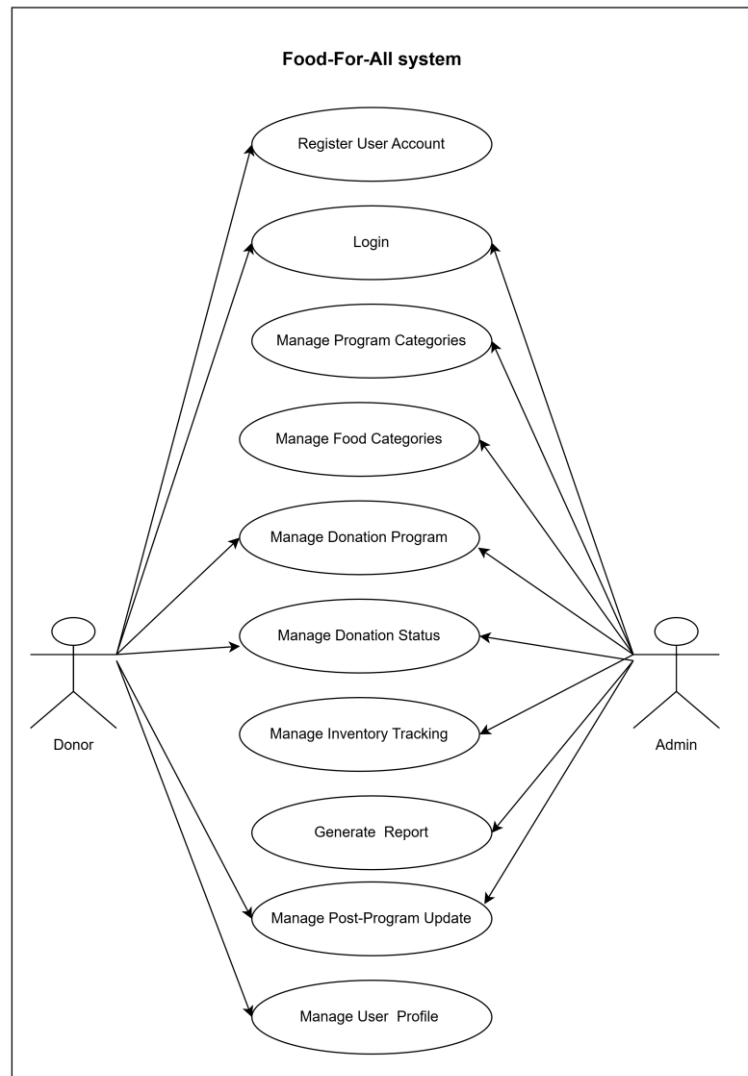
No	Modules	Functionalities
6	Manage Donation Status	The system shall allow admins to view and update donation details, marking them as 'Pending,' 'Completed,' or 'Distributed' based on their status. Admins can also assign storage locations in the inventory. Additionally, the system shall allow donors to view their donation history and status.
7	Manage Inventory Tracking	The system shall allow admins to manage donated item expiration dates and system will categorize them automatically as Green (safe), Yellow (expiring in 30 days), Orange (expiring in 7 days), or Red(expired).
8	Generate Report	The system shall allow admins to search for donation programs and display category totals and summaries report based on the selected program.
9	Manage Post-Program Updates	The system shall allow admins to manage post-program updates by adding, editing, and deleting information about the successful distribution of items. Donors can view these updates in the 'Post-Program Updates' section.
10	Manage User Profile	The system shall allow donors to view and edit their profiles
11	Logout	The system shall allow both admins and donors to securely log out of the system to protect their account and data from unauthorized access.

**Table 3** *Non-Functional Requirement Analysis*

No	Requirements	Description
1	Security	The system shall only be accessed by authenticated users.
2	Performance	The system shall allow authorized admins and donors to log in using their valid email and password to access the system.
3	Availability	The system shall be available 99.9% of the time to ensure accessibility for donors and admins.
4	Scalability	The system shall be scalable to accommodate potential growth in the number of users and data volume.
5	Usability	The system should provide user-friendly interfaces that are easy to use. The design and flow application must be easy to understand.

## 4.2 Use Case Diagram

The system's functional requirements are often described in a use case diagram. Use case diagrams can help clients or users in comprehending how the system can do and need to function [6]. Based on Figure 3, there are total of eleven use cases in the Food-For-All System. Next, the donor and the admin are two actors involved in the system.



**Fig. 3** Use Case for Food-For-All System.

### 4.3 Class Diagram

A UML diagram used to represent classes and their relationships is known as a class diagram. UML class diagrams are essential for designing and illustrating software architecture, serving as a vital tool for developers to understand the core structure of a system [7]. The class diagram for the developed system is presented in Figure 4.

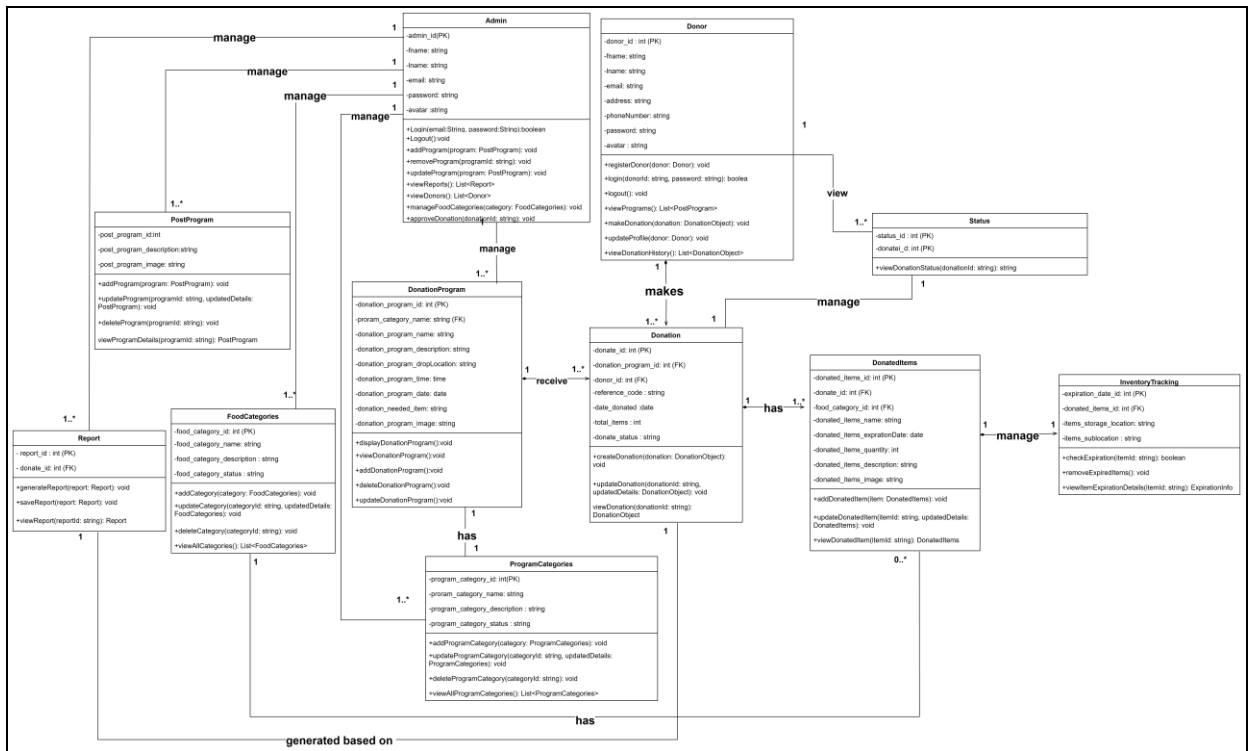


Fig. 4 Class Diagram for Food-For-All System

### 4.4 Implementation

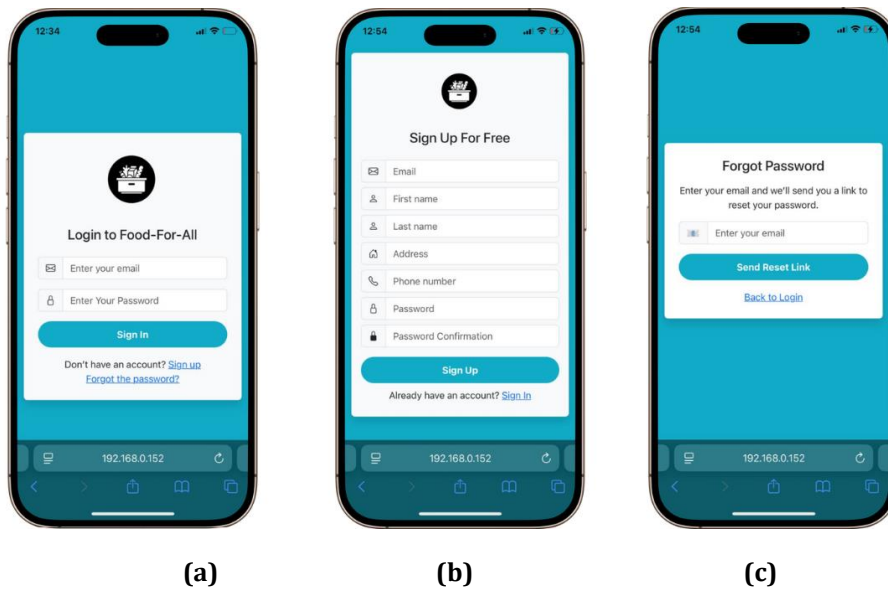
The primary goal of the implementation is to ensure that the system is developed in accordance with analysis and design phase. The Food-For-All system is created using HTML, CSS, and JavaScript for the front end, and PHP for the back end with the Visual Studio Code as the development environment. The MySQL database is utilized to store all the data.

#### 4.4.1 Donor Module

The donor module consists of seven submodules designed for individual functionality which are register, login, manage donation programs, manage donation status, manage post-program updates, manage user profile, and logout.

##### 4.4.1.1 Register and login Interface

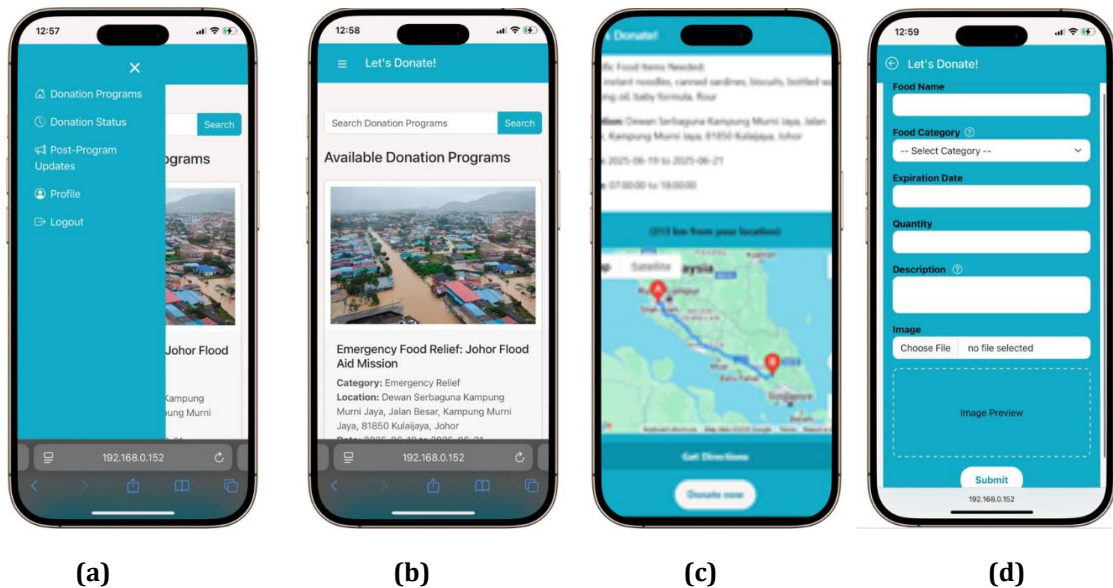
Figure 7(a) shows the registration page of the Food-For-All system for donors, where they can sign up by entering their email, name, address, phone number, password, and confirmation password. After registering, they are redirected to the login page Figure 7(b) to enter their email and password. If they forget their password, they can click the "Forgot Password" link, which leads to the reset page Figure 7(c), where they enter their email to receive a reset link.



**Fig. 7** (a) Registration Donor Account Interface; (b) Login Interface; (c)Forgot Password Interface

#### 4.4.1.2 Manage Donation Program Interface

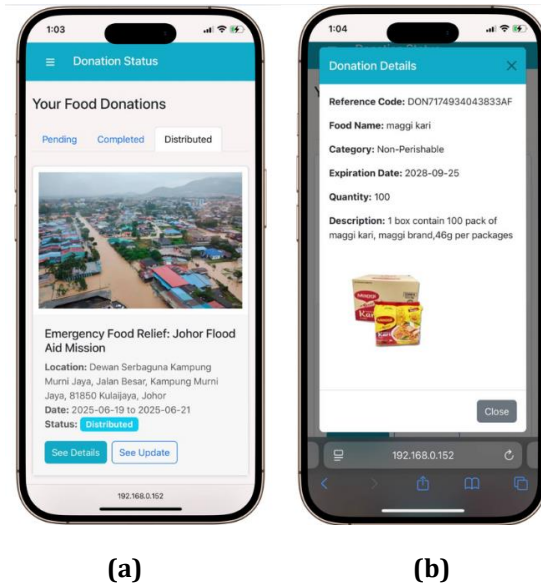
This section explains the process when a donor wants to make a donation. Figure 8(a) shows the sidebar navigation of the system. The user navigates to the Donation Program, which leads to the homepage displaying a list of donation programs, as shown in Figure 8(b). Donors can click "See Details" to view more information, which opens the donation detail interface. Then, the donor must fill in the food donation details, as shown in Figure 8(d).



**Fig. 8** (a) Side Bar Navigation; (b) Donor's Homepage Interface; (c)Donation Detail Interface; (d)Donation Form Interface

#### 4.4.1.3 Manage Donation Status Interface

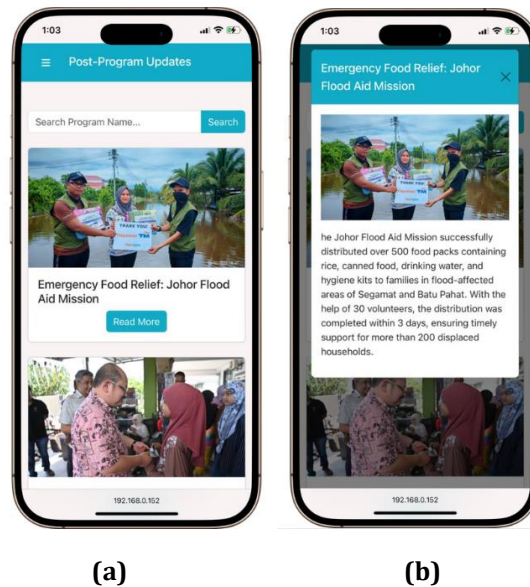
This section explains the process for a donor to view the status and history of their donations. Figure 9(a) shows the Donation Status and History page, where donors can see the status of their donations whether pending, completed, or distributed. Donors can also view the details of each donation made to different programs, as shown in Figure 9(b).



**Fig. 9** (a) Donation Status and History Interface; (b) Donation Details History

#### 4.4.1.4 Manage Post-Program Update Interface

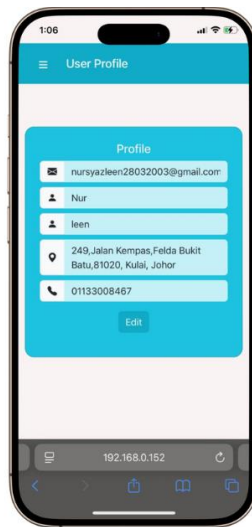
This section explains that after the donation items are distributed, donors can view the post-program updates, as shown in Figure 10(a). When donors click “Read More,” the system displays a brief description of the successful donation program, as shown in Figure 10(b). This allows donors to see the impact of their contributions.



**Fig. 10** (a) Post-Program Updates Interface; (b) Program Updates Details Interface

#### 4.4.1.5 Manage User Profile Interface

Figure 11 shows the donor's profile page, where they can edit their information such as first name, last name, address, and phone number. This allows their details to remain accurate and up to date.



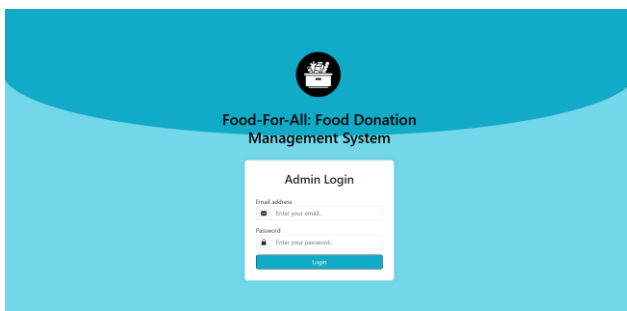
**Fig. 11** Manage User Profile Interface

#### 4.4.2 Admin Module

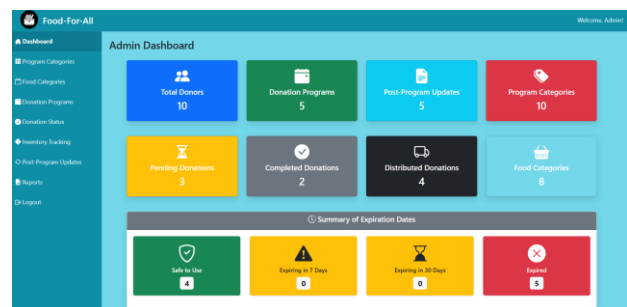
The admin module consists of eight submodules designed for individual functionality which are login, manage program categories, manage food categories, manage donation program, manage inventory tracking, manage donation status, manage post-program updates, and logout.

##### 4.4.2.1 Login Interface

Figure 12(a) shows the admin login page, where the admin needs to enter their email and password to access the system. After logging in, the system redirects to the admin dashboard, which displays summary information such as total donations, donors, programs, and expiration status, as shown in Figure 12(b). This makes it easy for the admin to quickly review and monitor overall system activity.



(a)



(b)

**Fig. 12** (a) Login Interface; (b) Admin Dashboard Interface

##### 4.4.2.2 Manage Program Categories Interface

Figure 13 shows how the admin manages donation program. Within this interface, the admin can add, view, edit, and delete these programs category. The donation program information includes category name, description and status.

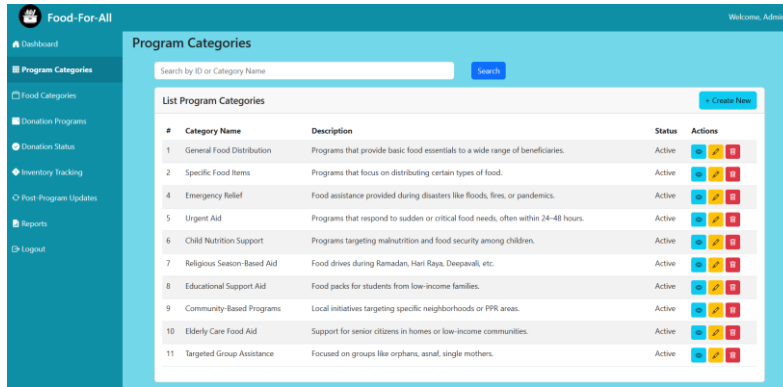


Fig. 13 Manage Program Categories Interface

### 4.4.2.3 Manage Food Categories Interface

Figure 14 shows how the admin manages food donation program. Within this interface, the admin can add, view, edit, and delete these food categories. The food category information includes category name, description and status.

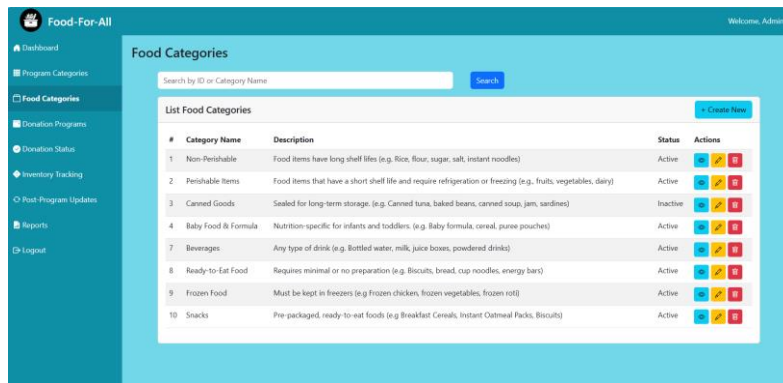


Fig. 14 Manage Food Donation Interface

### 4.4.2.4 Manage Donation Program Interface

Figure 15 shows how the admin manages and assigns donation programs. Within this interface, the admin can add, view, edit, and delete these programs. The program information includes category, program name, image, drop-off location, date, and time.

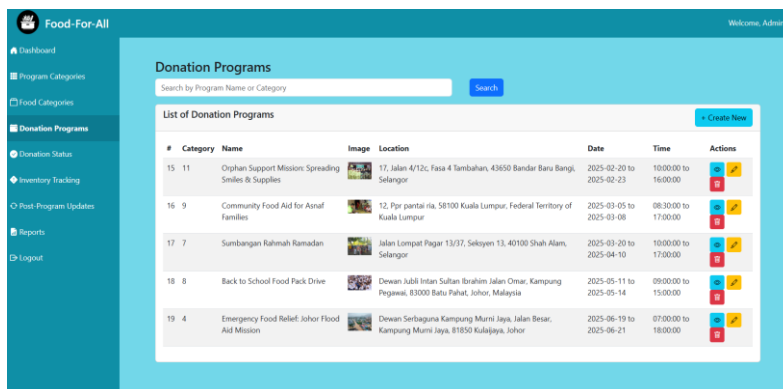


Fig. 15 Manage Donation Program Interface

### 4.4.2.3 Manage Donation Status Interface

Figure 16 shows how the admin manages the donation status of each donation. Within this interface, the admin can add, view, update the status, and delete donations. The admin can also view the details of each donation and update its status to either pending, completed, or distributed.

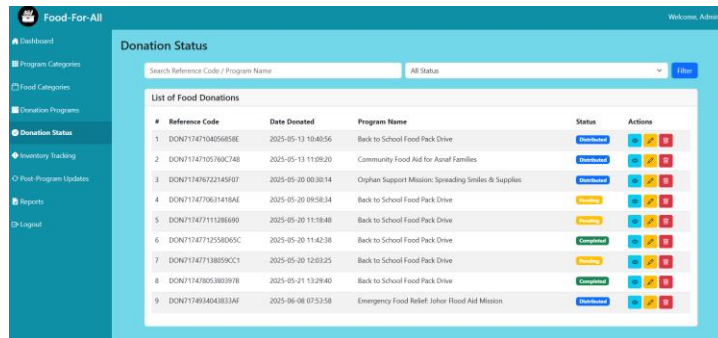


Fig.16 Manage Donation Status Interface

### 4.4.2.4 Manage Inventory Tracking Interface

Figure 17 shows how the admin manages donated items through inventory tracking. The admin can view details of each donated item, its storage location, and its status whether it is safe to use, expiring in 30 days, expiring in 7 days, or expired indicated by the colors green, yellow, orange, and red respectively. This feature becomes more effective when using the filter and search functions.

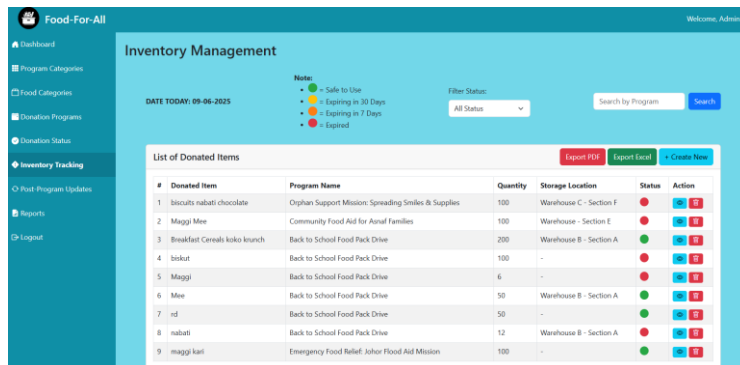


Fig.17 Manage Inventory Tracking Interface

### 4.4.2.5 Manage Report Interface

Figure 18(a) shows a summary of the donation programs, where the admin can export the report in PDF format, as shown in Figure 18(b), or Excel, based on preference. The report includes details of the programs, the total number of donors, and a summary of donated items categorized by type.

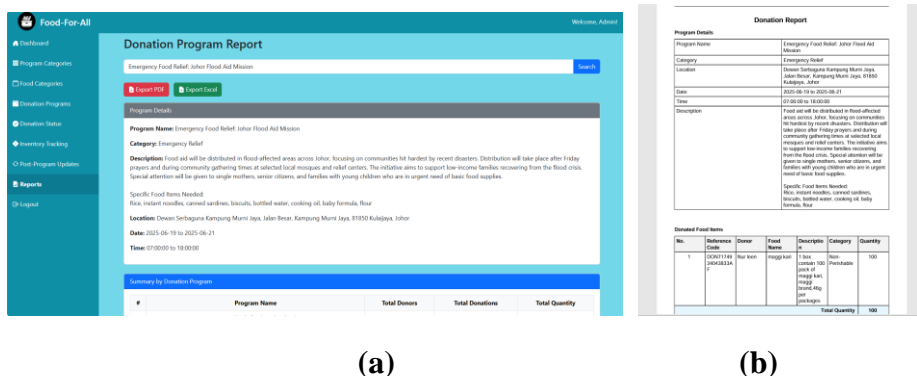
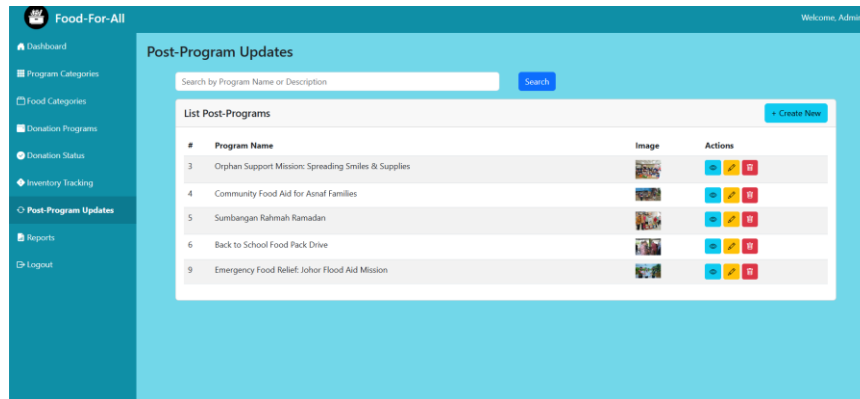


Fig. 18 (a) Manage Report Interface; (b) Donation Report in PDF

#### 4.4.2.6 Manage Post-Program Updates Interface

Figure 19 shows the interface where, after all successful donation items have been distributed to those in need, the admin can update the successful program. The admin can add, delete, view, and edit the updates. This feature is beneficial for keeping donors informed and maintaining transparency.



**Fig. 19** Manage *Post-Program Updates* Interface

### 4.5 Testing

This Testing plays a crucial role in various fields, including software development, education, and design processes. In software development, testing is essential for verifying requirements, validating software behaviour, and catching regressions in products [8].

#### 4.5.1 Alpha Testing

Alpha testing is conducted within the organization and involves evaluating the software by a selected group of end-users, typically at the developer's location, and sometimes by an independent testing team. It serves as the first round of thorough testing to ensure the software meets business requirements and functions correctly. This process is usually carried out by internal staff in a controlled environment or staging area. The purpose of alpha testing is to validate the system's performance and confirm that it performs all intended functions properly [9].

**Table 4** List of *Test Cases*

Functional Module	Test Case	Description	Expected Result	Test Result (Pass/Fail)
Registration User Account	Enter a valid registration detail	User enter valid email, first name, last name, address, phone number, password and confirmation password	System accepts all entered information without any issues and redirect to the login page.	Pass
	Enter mismatched password during registration	User provide a password that does not match the confirmation password	System displays an error message indicating password mismatch	Pass
	Attempt to register with existing email	User input details that are already registered by others users	System displays an error message indicating the email already exists.	Pass

**Table 4** List of Test Cases (cont)

Functional Module	Test Case	Description	Expected Result	Test Result (Pass/Fail)
Login	Submit registration with incomplete fields	User leave some required field blank	System displays an error message and highlights the fields that are incomplete.	Pass
	Login with valid credentials	User enter valid email and password	System successfully logs the user in, redirecting to the dashboard	Pass
	Login with incorrect email	User enter an email that does not exist in the system	System displays an error message indicating invalid email	Pass
	Login with incorrect password	User enter correct email but incorrect password	System displays an error message indicating incorrect password	Pass
	Login with both incorrect email and password	User enter email and password combination that do not exist	System displays an error message indicating both email and password are incorrect	Pass
Manage Donation Program	View selected Donation program	Admin view selected donation program detail.	The system shall retrieve and display the details of the selected donation program accurately.	Pass
	Add Donation Program	Admin enter program category, name, image, location, date, time, description on the Add New Donation Program form	The new food category shall be stored correctly in the system's database.	Pass
	Edit Donation Program	Admin edit the details of the donation program.	The details modified shall be correctly saved and updated in the system's database.	Pass
	Delete Donation Program	Admin delete the selected donation program detail.	Upon confirming the deletion action, the program details shall be permanently removed from the system's database.	Pass
	Fill in donation form for the selected program	Donor enters the details of donated food such as name, category, expiration date, quantity and description, image in the donation form.	The system should accept and store the entered information accurately.	Pass

**Table 4** List of Test Cases (cont)

Functional Module	Test Case	Description	Expected Result	Test Result (Pass/Fail)
Manage Donation Status	View donation information	Admin select a donation make by donor and view the details	The system should retrieve and display the details of the selected donation accurately.	Pass
	Assign inventory location	Admin assign location of inventory storage of each donated item.	The assigned location shall be stored correctly in the system's database.	Pass
	Update donation status	Admin select current donation status: "Pending", "Completed" or "Distributed"	The status change should be accurately processed and reflected in the donation details	Pass
Manage Inventory Tracking	View food item details	Admin view selected food item detail.	The system shall retrieve and display the details of the selected food item accurately	Pass
	Automation of Food Item Status Assignment	The system automatically categorizes each food item based on its expiration status. Green for safe items, Yellow for items expiring within 30 days, Orange for items expiring within 7 days, and Red for expired items.	The system shall correctly categorize each food item according to its expiration status.	Pass
	Notify total of each status on dashboard	The system displays the total number of food items in each expiration status category	The dashboard shall correctly show the total count of food items for each status category.	Pass
Generate Report	Display a general report for all donation activities	By default, the system displays a summary of all donation programs, including overall statistics such as total donors, food quantity, and categories involved.	The system shall correctly display a summarized report of all donation programs on the report page by default.	Pass
	Display a individual donation program	Admin search for a specific donation program to view its individual report, including detailed information such as donors, food items donated, quantities, and categories.	The system shall correctly retrieve and display detailed information for the selected donation program based on the admin's search input.	Pass

**Table 4** List of Test Cases (cont)

Functional Module	Test Case	Description	Expected Result	Test Result (Pass/Fail)
Manage Post-Program Updates	Save donation report to PDF and Excel	Admin export donation reports in both PDF and Excel formats	The system shall generate and download the donation report correctly in PDF and Excel formats upon user request.	Pass
	View post-program details	Admin view selected donation program detail.	The system shall retrieve and display the details of the selected post-program program accurately.	Pass
	Add Post-Program Updates	Admin enter program name, report description and image of the program detail.	The new post-program update shall be stored correctly in the system's database.	Pass
Manage User Profile	Edit User Profile Information	Donor updates editable fields in their profile, such email, first name, last name, address and phone number.	The system shall save and reflect the updated profile information correctly. Successful message displayed.	Pass
	Validate Required Fields	Donor leaves some required field blank	System displays an error message and highlights the fields that are incomplete.	Pass

### 4.5.2 Beta Testing

Beta testing allows real users to use the product in a live environment to uncover any issues or defects before the official release. Beta tests can be either open or closed. In an open beta, the product is made available to the public, often with a message indicating that it is in the beta phase, along with an option for users to provide feedback. In a closed beta, access is limited to a specific group of users, such as existing customers or selected testers who are invited to evaluate the product [10].

#### 4.5.2.1 User Acceptance Testing for Donor

Regarding the survey for users of the donation system, there were 11 respondents. 63.6% found it very easy and 36.4% found it easy to register and log in. All respondents (100%) were able to view donation programs, make donations without issues, and edit their profile information easily. Additionally, 100% agreed that the system provided clear and helpful error messages when mistakes were made. Navigation through the app was rated as very easy by 63.6% and easy by 36.4% of respondents. In terms of satisfaction with the donation process, 63.6% were very satisfied and 36.4% were satisfied. For the user interface, 54.5% rated it as excellent, 36.4% as good, and 9.1% as average. Finally, the overall ease of use and functionality of the system was rated as excellent by 45.5%, good by 45.5%, and average by 9.1% of respondents.

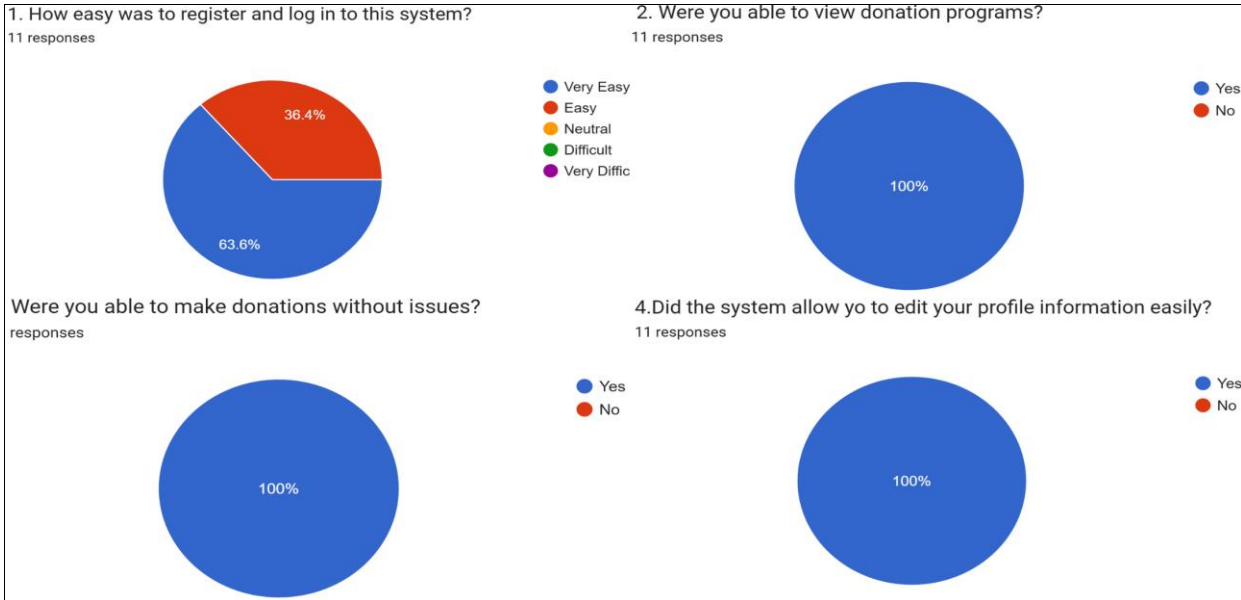


Fig. 20 User Acceptance Testing Result for Donors

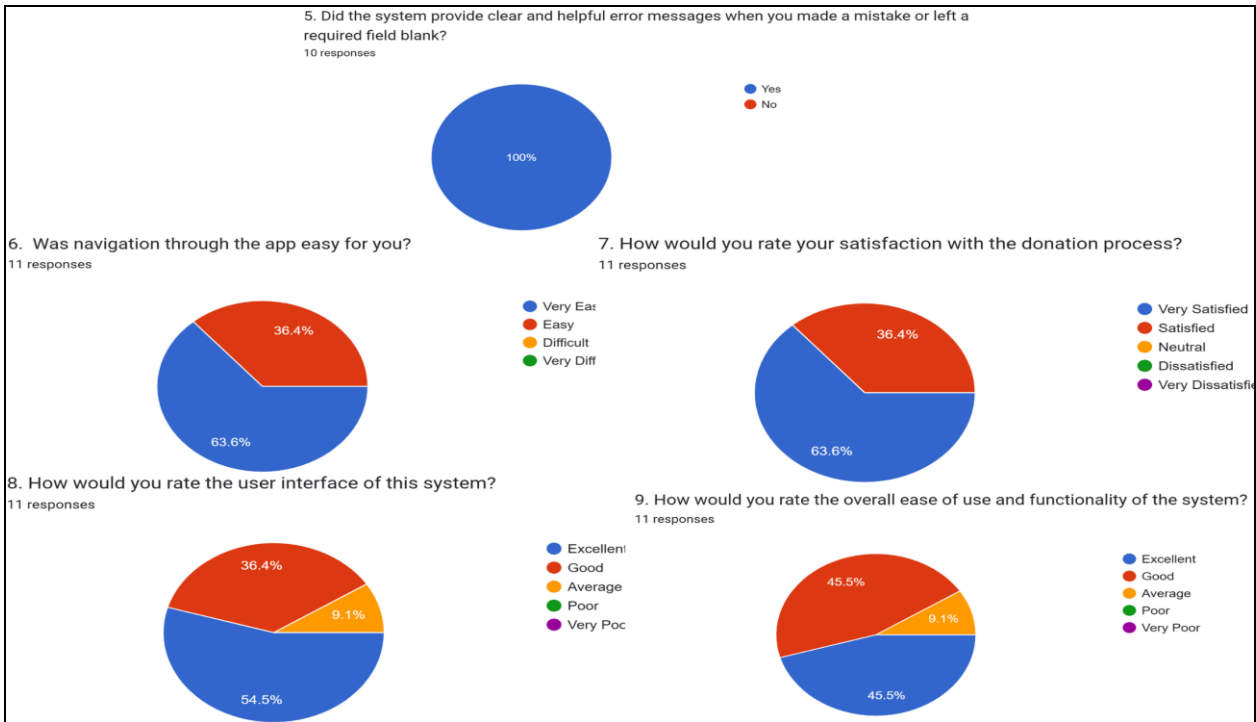


Fig. 21 User Acceptance Testing Result for Donors

#### 4.5.2.2 User Acceptance Testing for Admin

Regarding the survey for admin users of the system, there were 3 respondents. 66.7% found it very easy and 33.3% found it easy to log in to the dashboard. When asked about the dashboard’s usefulness in helping monitor and manage relevant information, 66.7% found it useful and 33.3% found it very useful. In terms of navigation, 66.7% found it very easy and 33.3% found it easy to navigate through different sections of the system. All respondents (100%) agreed that the system effectively handled all modules during management.

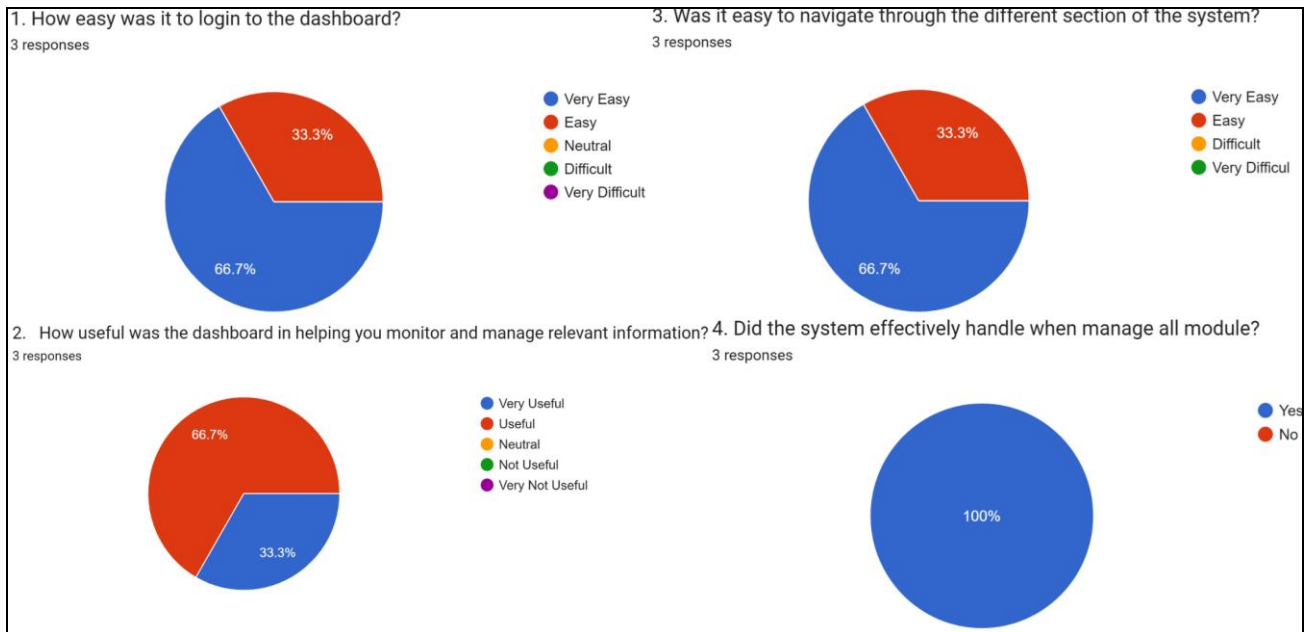


Fig. 22 User Acceptance Testing Result for Admin

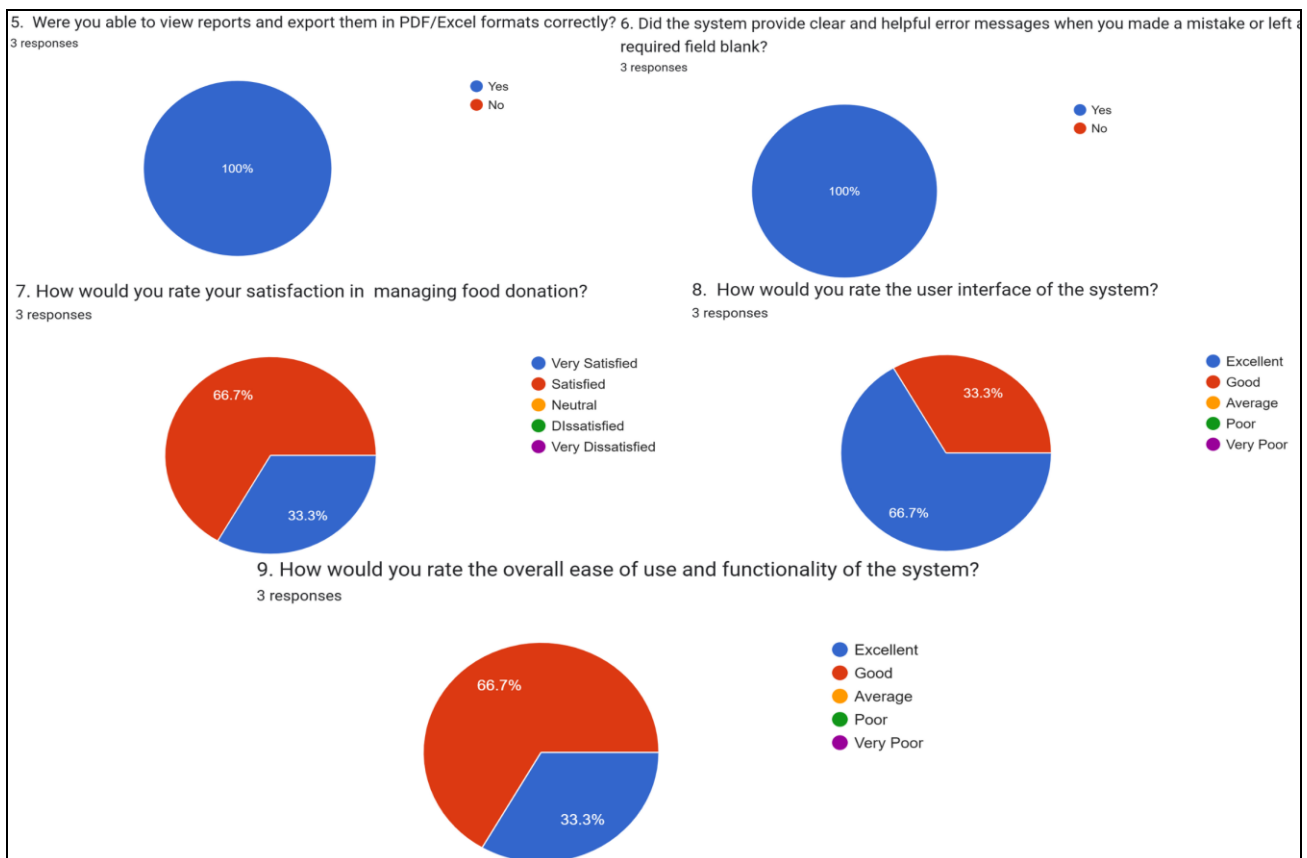


Fig. 23 User Acceptance Testing Result for Admin

### 5. Conclusion

In conclusion, the Food-For-All system has successfully addressed issues in food donation management, such as managing overstock and shortages, tracking expiration dates manually, and recording donor information using paper forms. It streamlines donations, improves transparency, and simplifies program organization for both donors and NGOs.

Key strengths include real-time status tracking, efficient data handling, and a user-friendly interface. However, minor limitations were identified, such as mobile view issues, the lack of notifications, and limited map filtering features.

To improve the system further, enhancements like a notification module, volunteer management features, and better mobile and add beneficiary module are recommended. Overall, Food-For-All meets its goals and offers a practical solution to support organized, impactful food donation efforts.

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## Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

## Author Contribution

The authors confirm contribution to the paper as follows: **study conception and design:** Nur Syazleen Binti Jalaluddin, Ts. Dr. Mazidah Binti Mat Rejab; **data collection:** Nur Syazleen Binti Jalaluddin, Ts. Dr. Mazidah Binti Mat Rejab; **analysis and interpretation of results:** Nur Syazleen Binti Jalaluddin, Ts. Dr. Mazidah Binti Mat Rejab; **draft manuscript preparation:** Nur Syazleen Binti Jalaluddin, Ts. Dr. Mazidah Binti Mat Rejab. All authors reviewed the results and approved the final version of the manuscript.

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