



**American International University-Bangladesh (AIUB)**  
**Department of Computer Science**  
**Faculty of Science & Technology (FST)**  
**WASTE FOOD MANAGEMENT AND DONATION SYSTEM**

A Software Engineering Project  
 Submitted By

Semester: Spring_2023_2024		Section: E	Group Number: 04	
SN	Student Name	Student ID	Contribution (CO3+CO4)	Individual Marks
01	Kazi Abdullah Jarif	22-46386-1	25.5%	
02	Faria Ahmed Richi	22-46371-1	25.5%	
03	Md. Ashfaq Ayub	22-46369-1	24.5%	
04	Eshita Rani Acharjee	22-46397-1	24.5%	

The project will be Evaluated for the following Course Outcomes

<b>CO3:</b> Select appropriate software engineering models, project management roles and their associated skills for the complex software engineering project and evaluate the sustainability of developed software, taking into consideration the societal and environmental aspects	Total Marks	
	Appropriate Process Model Selection and Argumentation with Evidence	[5 Marks]
	Evidence of Argumentation regarding process model selection	[5Marks]
	Evaluate the sustainability of the developed software in terms of both society and the environment (Impact identification)	[5Marks]
Submission, Defense, Completeness, Spelling, grammar and Organization of the Project report		[5Marks]
<b>CO4:</b> Develop project management plan to manage software engineering projects following the principles of engineering management and economic decision process	Total Marks	
	Develop the project plan, its components of the proposed software products	[5Marks]
	Identify all the activities/tasks related to project management and categorize them within the WBS structure. Perform detailed effort estimation correspond with the WBS and schedule the activities with resources	[5Marks]
	Identify all the potential risks in the specific project and prioritizing/categorizing those to overcome the risk factors.	[5Marks]

Description of Student's Contribution in the Project work

Student Name: **Md. Ashfaq Ayub**

Student ID: **22-46369-1**

Contribution in Percentage (24.5%):

Contribution in the Project:

- Contribution Description 1
- Contribution Description 2

Ashfaq

Signature of the Student

Student Name: **Faria Ahmed Richi**

Student ID: **22-46371-1**

Contribution in Percentage (25.5%):

Contribution in the Project:

- Contribution Description 1
- Contribution Description 2

Richi

Signature of the Student

Student Name: **Kazi Abdullah Jarif**

Student ID: **22-46386-1**

Contribution in Percentage (25.5%):

Contribution in the Project:

- Contribution Description 1
- Contribution Description 2

Jarif

Signature of the Student

Student Name: **Eshita Rani Acharjee**

Student ID: **22-46397-1**

Contribution in Percentage (24.5%):

Contribution in the Project:

- Contribution Description 1
- Contribution Description 2

Eshita

Signature of the Student

## 1. Project Description:

Food waste is an increasing issue right in the middle of Bangladesh, where vibrant cultures and communities are at home. Despite the friendly and giving nature of its people, leftover food frequently goes to waste, causing hunger and raising environmental issues. This project involves the efficient handling and redistribution of surplus food to minimize waste and alleviate food insecurity. It encompasses processes such as identifying sources of surplus food, collecting and sorting food items, matching them with suitable recipients (such as food banks, shelters, or community centers), and facilitating their timely delivery. This approach not only reduces food waste but also addresses social issues by providing nutritious meals to those in need. It often involves collaboration between food donors, recipient organizations, volunteers, and technology platforms to streamline the process and maximize the impact of food donations. The key functionalities for this project are user authentication and authorization (Users, including food donors, recipients, and volunteers, will be able to create accounts and manage their profiles), food donor management (Restaurants, grocery stores, and other food businesses can register as food donors on the platform. User will be able to input details about surplus food items, including quantity, type, and expiration dates), food recipient management (Organizations such as food banks, shelters, and community centers will register as food recipients), donation matching (This module aims to optimize the allocation of food donations to ensure that they reach those who need them most efficiently), volunteer management (food collection, sorting and delivery) and pickup and delivery management (The platform will facilitate communication and coordination between donors and recipients for food pickup and delivery).

## 2. Problem Statement:

In society, a notable problem persists with food being wasted alongside a worrying number of individuals experiencing hunger and malnutrition. This issue spans across different sectors, encompassing households, restaurants, supermarkets and events. Despite attempts to address food waste, there exists a gap in efficiently managing and redistributing surplus food to those who require it. The inefficiency not only worsens problems related to hunger and food insecurity but also contributes to environment degradation due to elevated greenhouse gas emissions and the squandering of resources.

- **Lack of coordination:** There is a lack of integrated system that facilitates efficient communication and coordination between food donors (e.g., households, restaurants, supermarkets, events), food recovery organizations, and beneficiaries (e.g., shelters, soup kitchen, disadvantaged communities).
- **Logical issues:** Transportation and storage logistics present significant challenges in collecting surplus food from donors and delivering it to beneficiaries in a timely manner, especially considering the perishable nature of food items.
- **Technological barriers:** Limited access to technology and lack of awareness about available platforms hinder the adoption of digital solutions for food donation and management.
- **Stigma and perception:** Social stigma associated with receiving donated food often prevents individuals from accessing available resources, further exacerbating food insecurity.

- **Sustainability concerns:** The disposal of food waste in landfills contributes to environmental pollution and climate change. Addressing this aspect requires sustainable waste management practices and raising awareness about the environmental impact of food waste.
- **Resources constrains:** Food recovery organizations often operate with limited resources, including funding, manpower and infrastructure, which restricts their capacity to scale operations and reach more beneficiaries effectively.

### 3. Solution of the problem:

#### Project thesis/objective:

- **Waste Reduction:** The primary goal is to develop strategies and systems to reduce the amount of food wasted at various stages of the supply chain, including production, distribution and consumption. This may involve implementing better inventory management practices, improving packaging to extend shelf life, or promoting consumer awareness and behavior change to minimize food waste.
- **Donation infrastructure:** Another key objective is to establish an efficient and effective system for collecting surplus food from restaurants, supermarkets, caterers and other food establishments, and redistributing it to those in need. This could involve creating partnerships between food businesses and charitable organizations, as well as developing logistics networks for safe and timely food transportation.
- **Technology integration:** Incorporating technology is essential for strengthening the waste food management and donation process. This may include developing online platforms to facilitate food donations, track inventory and coordinate pickups and deliveries. Additionally, implementing data analytics tools can help identify patterns of food waste and optimize resource allocation.

#### Proposed solution:

- **Efficient redistribution:** Develop a streamlined system for the collection, storage, and redistribution of surplus food to ensure that it reaches beneficiaries in a timely manner while maintaining food safety standards.
- **Combat Hunger and Food Insecurity:** The project aims to solve hunger by ensuring that surplus food reaches marginalized and underprivileged communities promptly.
- **Promote Sustainability and Community Engagement:** The project seeks to foster a sense of social responsibility and community engagement by encouraging individuals, restaurants, and businesses to actively participate in reducing food wastage and supporting the less fortunate.
- **Technological integration:** implement digital platforms and mobile applications to facilitate communication between donors, food recovery organizations, and beneficiaries, improving the efficiency and transparency of the donation process.

- **Regulatory compliance:** Advocate for policy reforms and provide guidance to donors on food safety regulations, liability protections, and tax incentives to encourage food donation and minimize large barriers.
- **Inclusivity and dignity:** Create a supportive environment that promotes inclusivity and respects the dignity of beneficiaries, addressing social stigma and ensuring that donated food is distributed in a dignified manner.

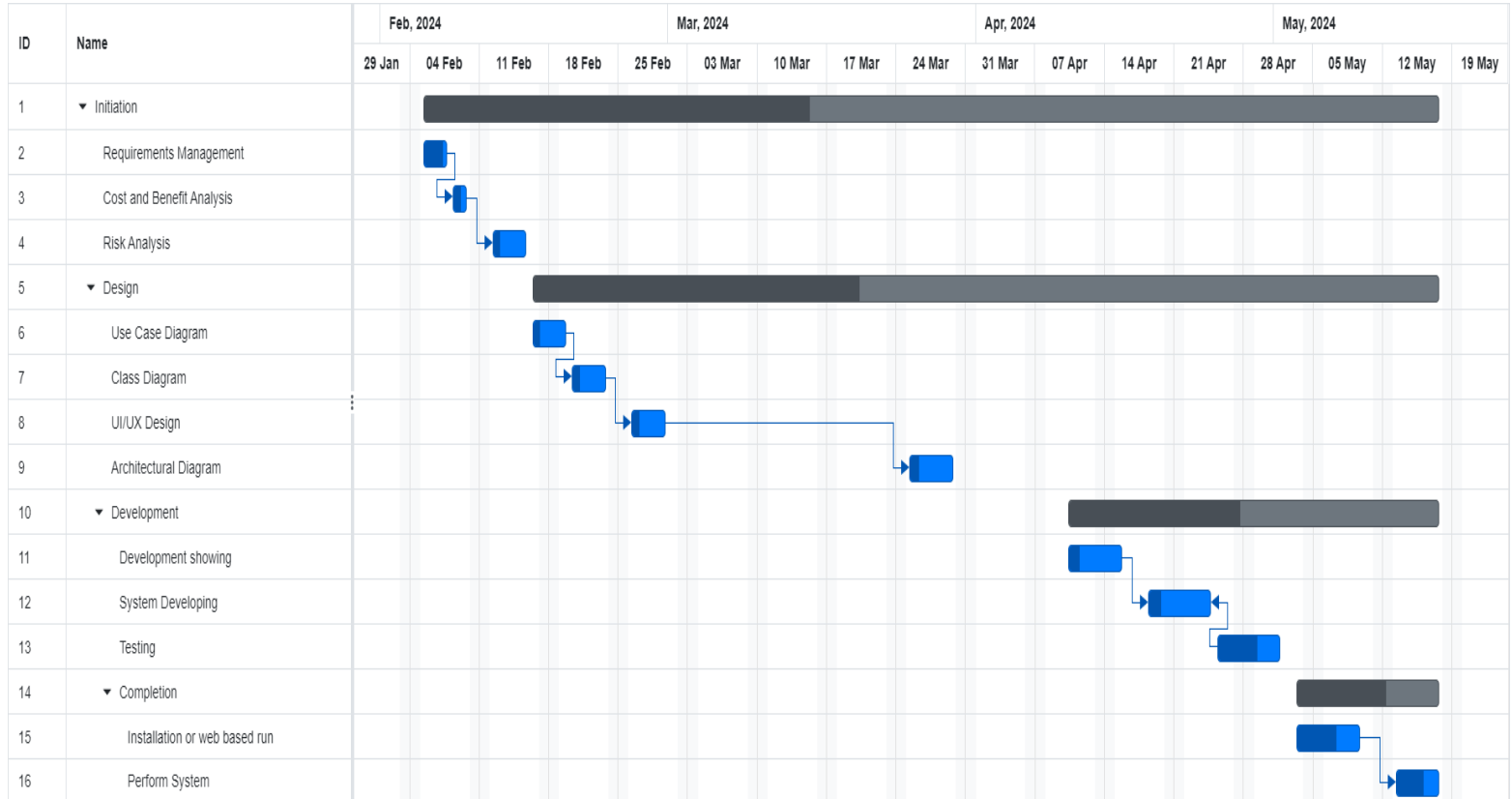
#### 4. **Process Model:**

For waste food management and donation system project, the agile methodology would be suitable due to its iterative and flexible approach, which allows for frequent feedback and adaptation to changing requirements. Within the agile framework, one specific model that could be utilized is Scrum. Scrum is a widely used agile framework that involves breaking down the project into small, manageable increments called sprints. Each sprint typically lasts for a few weeks and ends with potentially shippable product increment. Here's how Scrum could be applied to a waste food management and donation system project:

- **Product Backlog:** The project starts with a product backlog, which is a prioritized list of all desired features and functionalities of the waste food management and donation system. This backlog is dynamic and evolves throughout the project.
- **Sprint Planning:** At the beginning of each sprint, the Scrum team, including developers, designers, and other stakeholders, conducts a sprint planning meeting. During this meeting, they select items from the product backlog to work on during the upcoming sprint and break them down into smaller tasks.
- **Daily Stand-ups:** Each day of the sprint, the team holds a brief daily stand-up meeting to discuss progress, any obstacles encountered, and plans for the next 24 hours. This ensures transparency and keeps everyone aligned.
- **Sprint Review:** At the end of each sprint, the team presents the completed work to stockholders in the sprint review meeting. Feedback is collected and adjustments are made to the product backlog based on this feedback.
- **Sprint Retrospective:** After the sprint review, the team holds a retrospective meeting to reflect on what went well during the sprint and what could be improved. They identify actionable items to enhance their processes in the next sprint.
- **Incremental Delivery:** Throughout the project, the waste food management and donation system is built incrementally, with each sprint delivering a potentially shippable product increment.
- **Adaptability:** Scrum embraces change and allows for flexibility in responding to evolving requirements and stakeholder feedback. This is particularly beneficial in a project like waste food management and donation system, where requirements may change based on user needs or external factors.

By following the Scrum framework within an agile process model, the waste food management and donation system project can benefit from increased collaboration, transparency, and adaptability, ultimately leading to the successful delivery of a high-quality product that meets the needs of its users.

## 5. Schedule/WBS:



**Figure: Gantt Chart**

## 6. Project Risk:

### Project Risk, Impact, Risk level

Date of last review: **16.04.2024**

ID	Description of Risk	Impact	Risk Reponse	Risk Level	Risk owner	Notes
1	Supplier delay	Pushes launch	Confirm delivery dates by Phase 2	High	Richi	SAMPLE
2	Food shortage	Reduces efficiency in waste processing.	Adjusting processing schedules.	Low	Richi	SAMPLE
3	Data Security and Privacy	Compromises customer information leading to identity theft or fraud	Implementing encryption protocols for sensitive data transmission	High	Jarif, Ashfaq and Eishita	SAMPLE
4	Food Contamination	Public health crises.	Implementing strict sanitation protocols and regular monitoring of food handling processes.	High	Jarif	SAMPLE
5	Software integration challenges	Disruptes workflow efficiency.	Conducting thorough compatibility testing before implementation.	Low	Ashfaq	SAMPLE
6	Implement feedback mechanism	Continuous refinement and imrovement of system based	Heavily relies on gathering	Low	Eishita	SAMPLE
7	Volunteer management	Ensure edequite training and supervirsion of volunteers	Develop emergency respons plans and communication protocols	High	Jarif, Ashfaq and Eishita	SAMPLE
8	Software obsolescence, compatibility issues	Technological obsolescence	Regular Software Updates and Maintenance,User Training and Support	Low	Eishita	SAMPLE
9	Exceed the project budget	Cost Overruns	Regular Budget Monitoring,Stakeholder Communication	High	Eishita	SAMPLE

## 7. Project Requirements:

### Functional requirements:

These are the requirements that the end specifically demands as basic facilities that the system should offer. All these functionalities need to be necessarily into the system as a part of the contract.

#### 1. **For Donor**

- Donate item (after clicking on the donate button, the user is prompted to select the item they wish to donate and indicate the location from which they would like to be picked up. Subsequently, a volunteer is assigned to collect the item on behalf of the user.)
- The user can check the progress of their donated item and the current location of the volunteer assigned to collect it.
- The recipient or NGO is searched and selected by the user based on their needs.

## **2. For Volunteers**

- Accept requests given by management.
- Go to locations and pick up items that are provided by the donor.

## **3. For Recipient**

- Accept and manage requests by the donors and assign volunteers for the same.
- Keep track of the performance and whereabouts of the volunteers.

## **4. For Administrator**

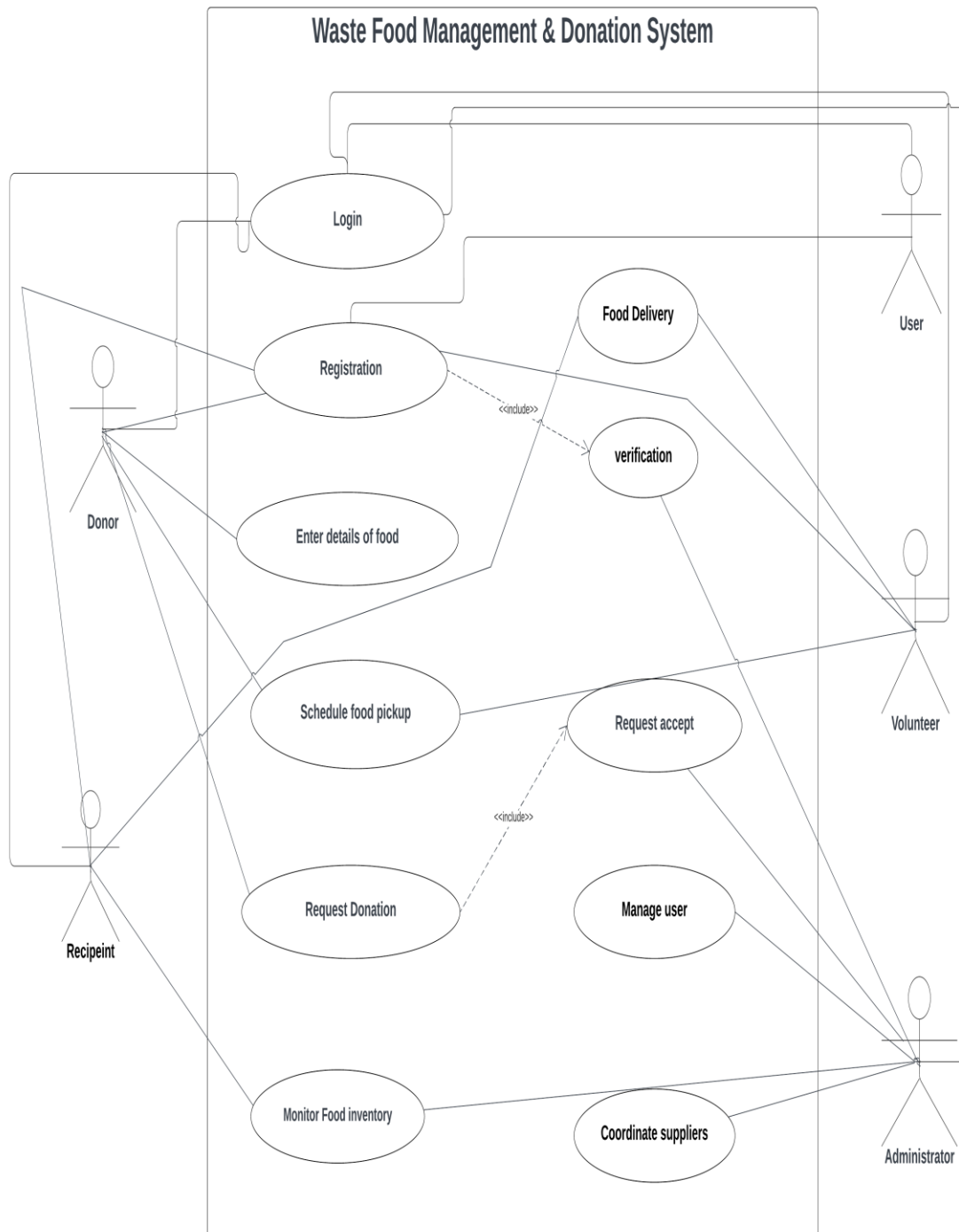
- Admins shall manage database information and shall to relevant tasks related to the same.

## **Non-Functional Requirements:**

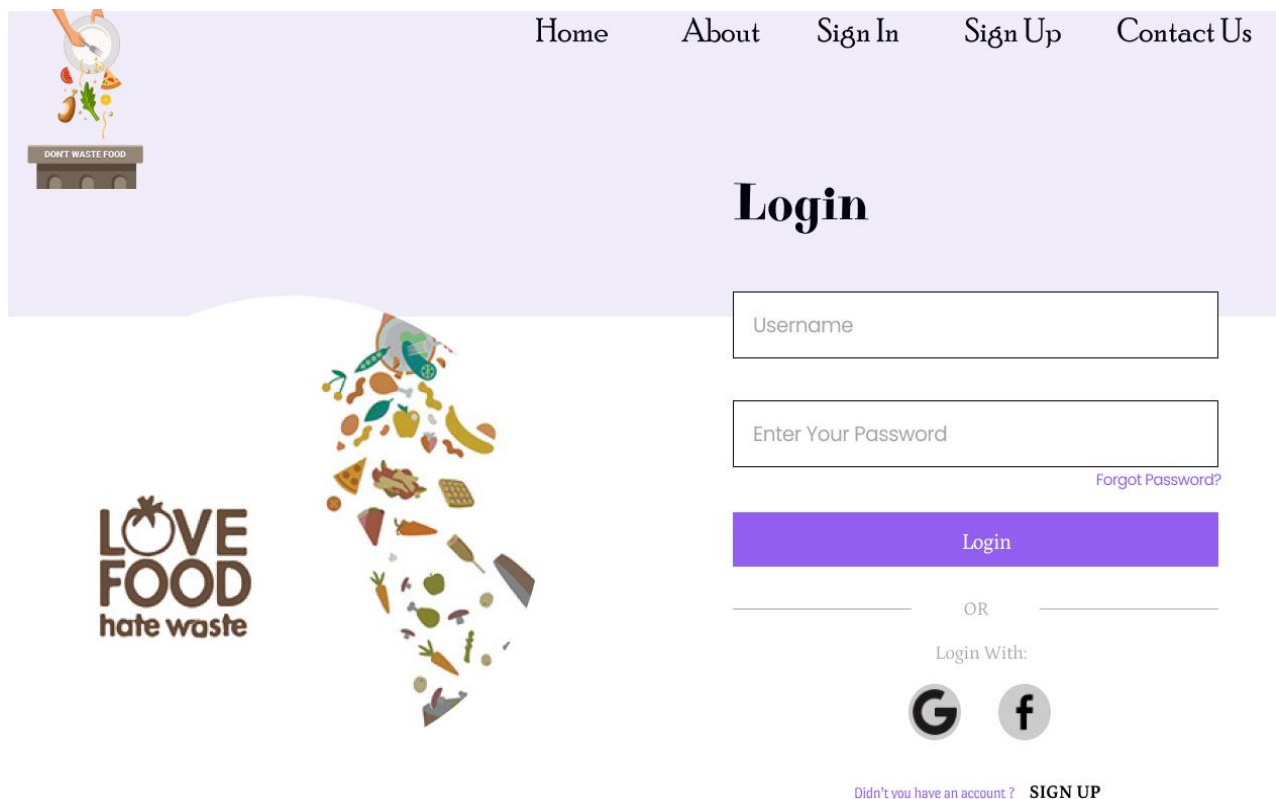
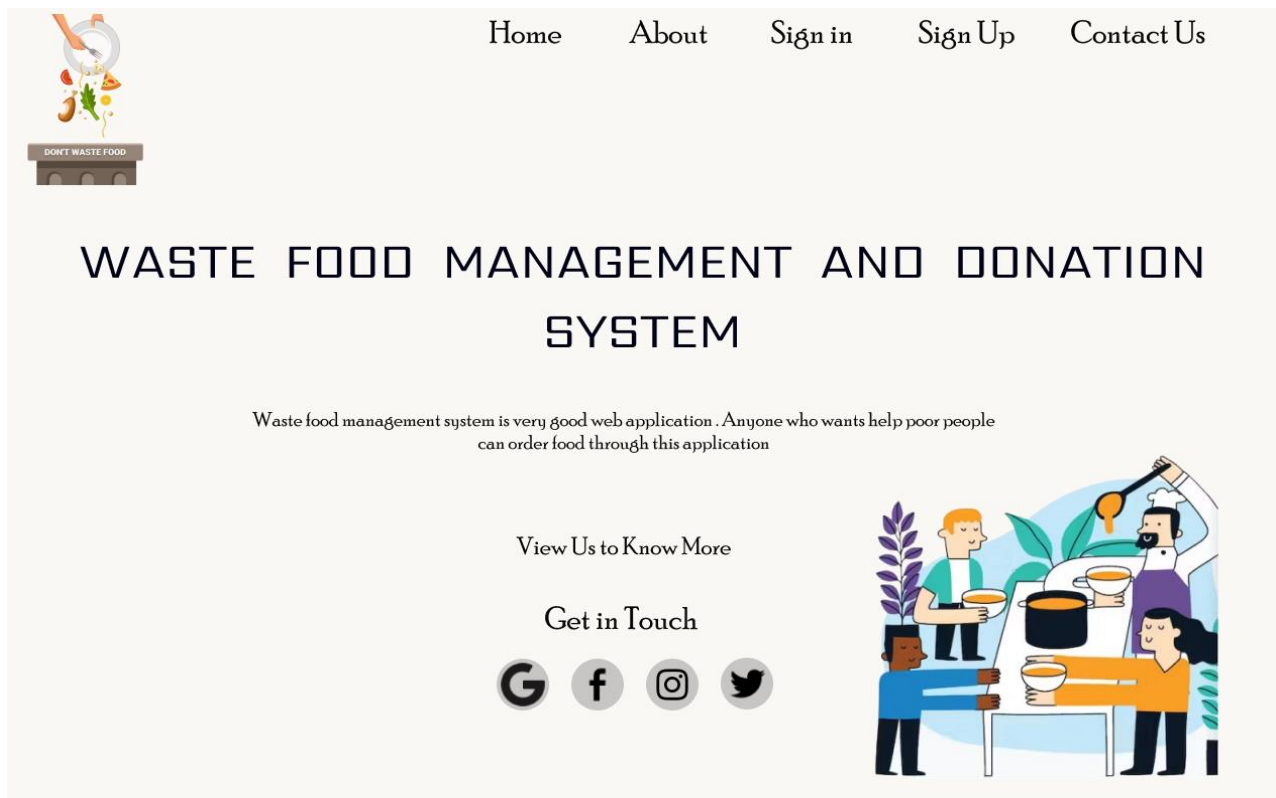
- **Security**
  - The system should ensure the security and privacy of user information and transaction data, employing measures such as encryption, access control and secure authentication.
- **Reliability**
  - The system should be reliable, ensuring that donated food items are accurately listed and managed, and that donation requests are handled promptly and efficiently.
- **Scalability**
  - The system should be able to handle a potentially large volume of users, listings, and donation requests, scaling its resources as needed to accommodate growth.
- **Usability:**
  - The system should be user-friendly and intuitive with clear interfaces and guidance to facilitate easy participation by users of varying technical proficiency.
- **Performance**
  - The system should be responsive and performant, minimizing delays in listing food items, processing donation requests, and coordinating pickup/deliveries.
- **Accessibility**
  - The system should be accessible to users with disabilities, complying with relevant accessibility standards and providing features such as screen reader support and alternative input methods.

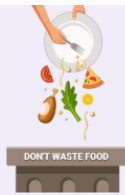


## Use Case Diagram:



## 8. Prototype Design:

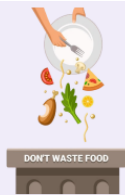


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## Sign Up

[Next](#)

[Already yo have an account ?](#) [Login](#)

[Next](#)

## Register Your Details

[Register](#)



**Awesome!**

Your registration has been  
completed successfully

OK



## Forgot Password ?

Enter Your Email ID

Send OTP



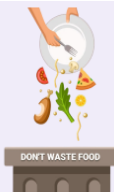
## Enter OTP

Your OTP sent to  
mustakimjarif2001@gmail.com

Confirm

Resend code in 10sec

[Didn't receive code?](#)



## Reset Password ?

Enter new Password

Confirm Password

Reset



## Want to share food?



Choose your role

☒ **Donor**

Donate some food to the needful.

☐ **Receiver**

Pickup and deliver food to the needful

☐ **Volunteer**

Pickup and deliver food to the needful

Continue



## Donor Details



Restaurant



Bakery



Individual

Restaurant Name

Contact Name (Optional)

Mobile Number

Email Id

Email Id

Submit





**Congrates Donor !**

You are all set to go

OK



**I want to become Receiver**

Choose your role



☐ **Donor**

Donate some food to the needful.

☒ **Receiver**

Get the food

☐ **Volunteer**

Pickup and deliver food to the needful

Continue



## Receiver Details

 Trust	 NGO	 Individual
--	--	---

Receiver Name
Contact Name (Optional)
Mobile Number
Email Id
Address

Submit
--------



**Congrates Receiver !**

Your food request posted successfully

OK
----





## I want to become Volunteer

Choose your role

☐ Donor

Donate some food to the needful.

☐ Receiver

Get the food

☒ Volunteer

Pickup and deliver food to the needful

Continue



## Volunteer Details

Name

Mobile Number

Email Id

Address

Submit



## Congrates Volunteer !

Your food request posted successfully

OK

[Home](#)

[Sign In](#)

[Sign Up](#)

[Join now](#)

**Be The Reason  
Someone Smiles Today!**



**Worldwide Leaders**



**Trusted Organizatin**

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**24 7 Expert Advice**

## **Project: Waste Food Management and Donation System**

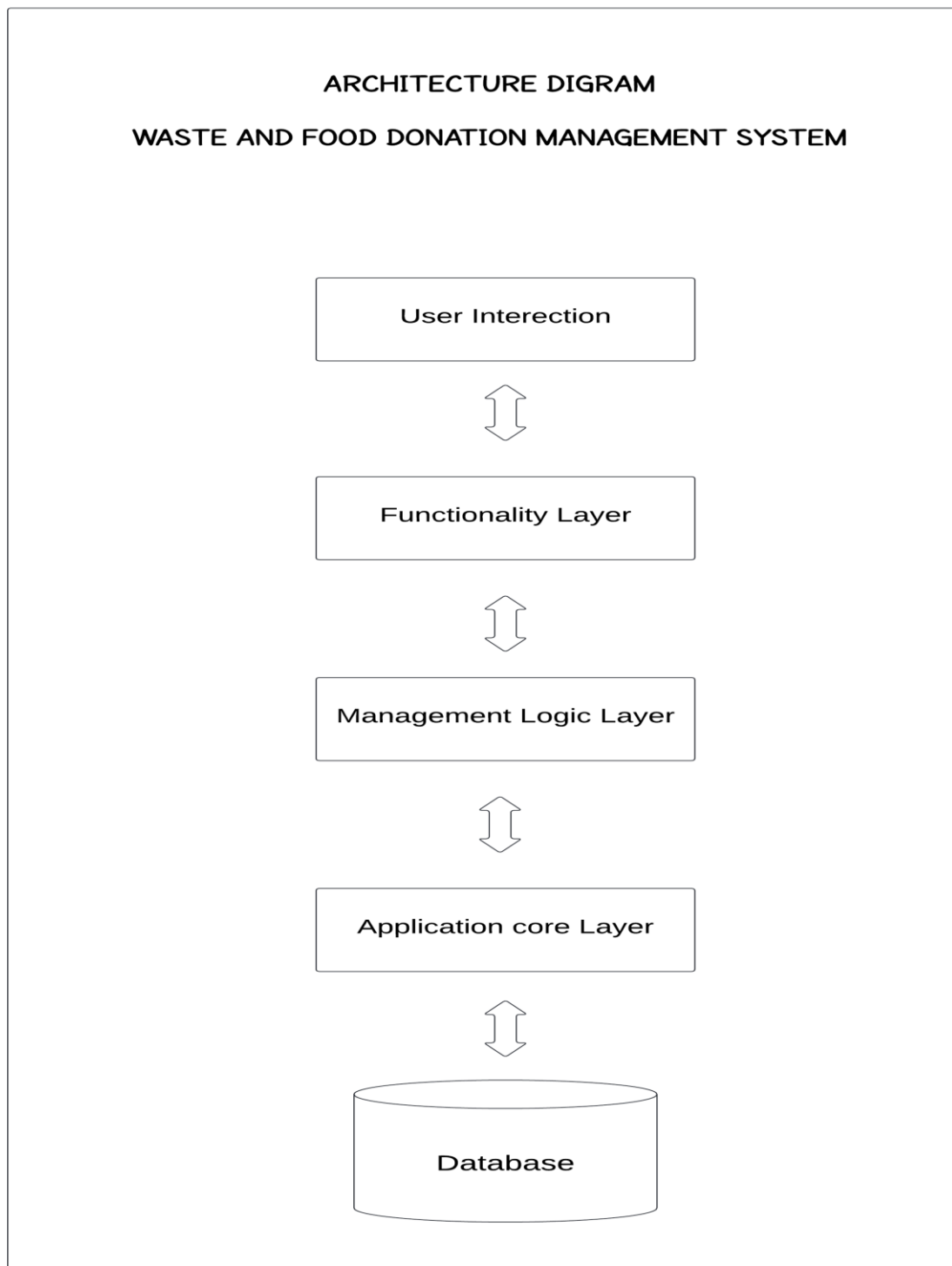
### **Figma Design**

[https://www.figma.com/file/5heJM1M6UK9XqcHV8oZrHy/Software-Project-\(-waste-food-management-and-donation-system\)?type=design&node-id=0%3A1&mode=design&t=0vr5tUTYgsGOkdZd-1](https://www.figma.com/file/5heJM1M6UK9XqcHV8oZrHy/Software-Project-(-waste-food-management-and-donation-system)?type=design&node-id=0%3A1&mode=design&t=0vr5tUTYgsGOkdZd-1)

### **Project Playable Link:**

[https://www.figma.com/proto/5heJM1M6UK9XqcHV8oZrHy/Software-Project-\(-waste-food-management-and-donation-system\)?pageid=0%3A1&type=design&node-id=4-8&viewport=-252%2C397%2C0.17&t=vMokRy1zJPXYVhv0-1&scaling=min-zoom&starting-pointnode-id=4%3A8&show-prot-sidebar=1&mode=design](https://www.figma.com/proto/5heJM1M6UK9XqcHV8oZrHy/Software-Project-(-waste-food-management-and-donation-system)?pageid=0%3A1&type=design&node-id=4-8&viewport=-252%2C397%2C0.17&t=vMokRy1zJPXYVhv0-1&scaling=min-zoom&starting-pointnode-id=4%3A8&show-prot-sidebar=1&mode=design)

## 9. Architectural Diagram:



## 10. Class Diagram:



### 13. Test/SQA Plan:

Test Case ID	SE_001	Test Case Description	Test the Login Functionality in User Authentication		
Created By	Jarif	Reviewed By	Ashfaq	Version	2.1

QA Tester's Log	Review comments from Ashfaq incorporate in version 2.1
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Tester's Name	Jarif	Date Tested	23-Apr-2024	Test Case (Pass/Fail/Not Executed)	Pass
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S #	Prerequisites:
1	Access to Chrome Browser
2	

S #	Test Data
1	User ID = mg12345
2	Pass = df12@434c

Test Scenario	Verify on entering valid User Id and password, the customer can login
---------------	---

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Navigate to <a href="https://www.figma.com/file/5heJM1M6UK9XqcHV8oZrHy/Software-Project-(-waste-food-management-and-donation-system)?type=design&amp;node-id=0%3A1&amp;mode=design&amp;t=znh4qnegAQyViLWk-1">https://www.figma.com/file/5heJM1M6UK9XqcHV8oZrHy/Software-Project-(-waste-food-management-and-donation-system)?type=design&amp;node-id=0%3A1&amp;mode=design&amp;t=znh4qnegAQyViLWk-1</a>	Site should open	As Expected	Pass
2	Enter User ID & Password	Credential can be entered	As Expected	Pass
3	Click Submit	User is logged in	As Expected	Pass

Test Case ID	SE_003	Test Case Description	Test the donation submission process		
Created By	Richi	Reviewed By	Ashfaq	Version	2.1

QA Tester’s Log	Review comments from Ashfaq incorporate in version 2.1
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Tester's Name	Richi	Date Tested	23-Apr-2024	Test Case (Pass/Fail/Not Executed)	Pass
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S #	Prerequisites:
1	Access to Chrome Browser
2	Ensure that user has valid credential to log into the system

S #	Test Data
1	Login and registration Credential
2	Donor information and create account

Test Scenario

Validate that user can submit donations effectively.

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Navigate to https://www.figma.com/proto/5heJM1M6UK9XqcHV8oZrHy/Software-Project-(-waste-food-management-and-donation-system)?page-id=0%3A1&type=design&node-id=69-23&viewport=-38%2C530%2C0.12&t=CkzGeoBFgvr4Pn3l-1&scaling=min-zoom&starting-point-node-id=4%3A8&show-proto-sidebar=1&mode=design	Site should open	As Expected	Pass
2	Login into the system using valid credential	User should be able to log in without errors.	As Expected	Pass
3	Fill in the required details for the donation	Donation details must be filled	As Expected	Pass

Test Case ID	SE_002	Test Case Description	Test in Registration Functionality		
Created By	Eishita	Reviewed By	Ashfaq	Version	2.1

QA Tester's Log	Review comments from Ashfaq incorporate in version 2.1
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Tester's Name	Eishita	Date Tested	23-Apr-2024	Test Case (Pass/Fail/Not Executed)	Pass
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S #	Prerequisites:	S #	Test Data
1	Access to Chrome Browser	1	Name: abcd
2		2	password: 1234##\$5
			Confirm Password: 1234##\$5

Test Scenario	Donors can register and authenticate into the system.
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Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Navigate to <a href="https://www.figma.com/proto/5heJM1M6UK9XqcHV8oZrHy/Software-Project-(-waste-food-management-and-donation-system)?page-id=0%3A1&amp;type=design&amp;node-id=15-1612&amp;viewport=-38%2C530%2C0.12&amp;t=DDYBZmgWQkAuNx2o-1&amp;scaling=min-zoom&amp;starting-point-node-id=4%3A8&amp;show-proto-sidebar=1&amp;mode=design">https://www.figma.com/proto/5heJM1M6UK9XqcHV8oZrHy/Software-Project-(-waste-food-management-and-donation-system)?page-id=0%3A1&amp;type=design&amp;node-id=15-1612&amp;viewport=-38%2C530%2C0.12&amp;t=DDYBZmgWQkAuNx2o-1&amp;scaling=min-zoom&amp;starting-point-node-id=4%3A8&amp;show-proto-sidebar=1&amp;mode=design</a>	Site should open	As Expected	Pass
2	Donors Create Account	Credential can be entered	As Expected	Pass
3	Click Submit	User is registered in	As Expected	Pass



<b>Test Case ID</b>	SE_004	<b>Test Case Description</b>	Test donation pickup and delivery		
<b>Created By</b>	Ashfaq	<b>Reviewed By</b>	Jarif	<b>Version</b>	2.1

<b>QA Tester’s Log</b>	Review comments from Jarif incorporate in version 2.1
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<b>Tester's Name</b>	Ashfaq	<b>Date Tested</b>	23-Apr-2024	<b>Test Case (Pass/Fail/Not Executed)</b>	Pass
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S #	Prerequisites:
1	A donation has been submitted and is awaiting pickup.
2	

S #	Test Data
1	Username of <b>Pickup/Delivery Agent: Mahim</b>
2	Pass = nM@789c

<b>Test Scenario</b>	Ensuring that donations are properly picked up and delivered to the intended recipients.
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Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Navigate to https://www.figma.com/proto/5heJM1M6UK9XqcHV8oZrHy/Software-Project-(-waste-food-management-and-donation-system)?page-id=0%3A1&type=design&node-id=69-74&viewport=-38%2C530%2C0.12&t=6BVjO24bpzDvvVYN-1&scaling=min-zoom&starting-point-node-id=4%3A8&show-proto-sidebar=1&mode=design	Site should open	As Expected	Pass
2	Log into the system as a designated pickup/delivery agent	Pickup/delivery agent should be able to log in without errors.	As Expected	Pass
3	Access the list of pending donations.	List of pending donations should be accessible without errors.	As Expected	Pass

<b>Test Case ID</b>	SE_005	<b>Test Case Description</b>	Test recipient receives and confirms donation		
<b>Created By</b>	Trina	<b>Reviewed By</b>	Ashfaq	<b>Version</b>	2.1

**QA Tester's Log**

Review comments from Ashfaq incorporate in version 2.1

<b>Tester's Name</b>	Trina	<b>Date Tested</b>	23-Apr-2024	<b>Test Case (Pass/Fail/Not Executed)</b>	Pass
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S #	Prerequisites:	S #	Test Data
1	A donation is marked for delivery to the recipient.	1	User Id = mg12345
2	Recipient has access to the system and is logged in.	2	Pass = df12@434c

**Test Scenario**

Ensuring that recipients can successfully receive donated items and confirm their receipt in the system.

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Recipient logs into the system using their credentials.	Recipient successfully logs into the system without errors.	As Expected	Pass
2	Recipient navigates to the "Received Donations" section.	"Received Donations" section is accessible, and the interface is user-friendly.	As Expected	Pass
3	Recipient locates the pending donation marked for delivery.	Pending donation marked for delivery is clearly visible in the list.	As Expected	Pass

Test Case ID	SE_006	Test Case Description	Test administrator manages user accounts		
Created By	Ashfaq	Reviewed By	Jarif	Version	2.1

QA Tester’s Log	Review comments from Jarif incorporate in version 2.1
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Tester's Name	Ashfaq	Date Tested	23-Apr-2024	Test Case (Pass/Fail/Not Executed)	Pass
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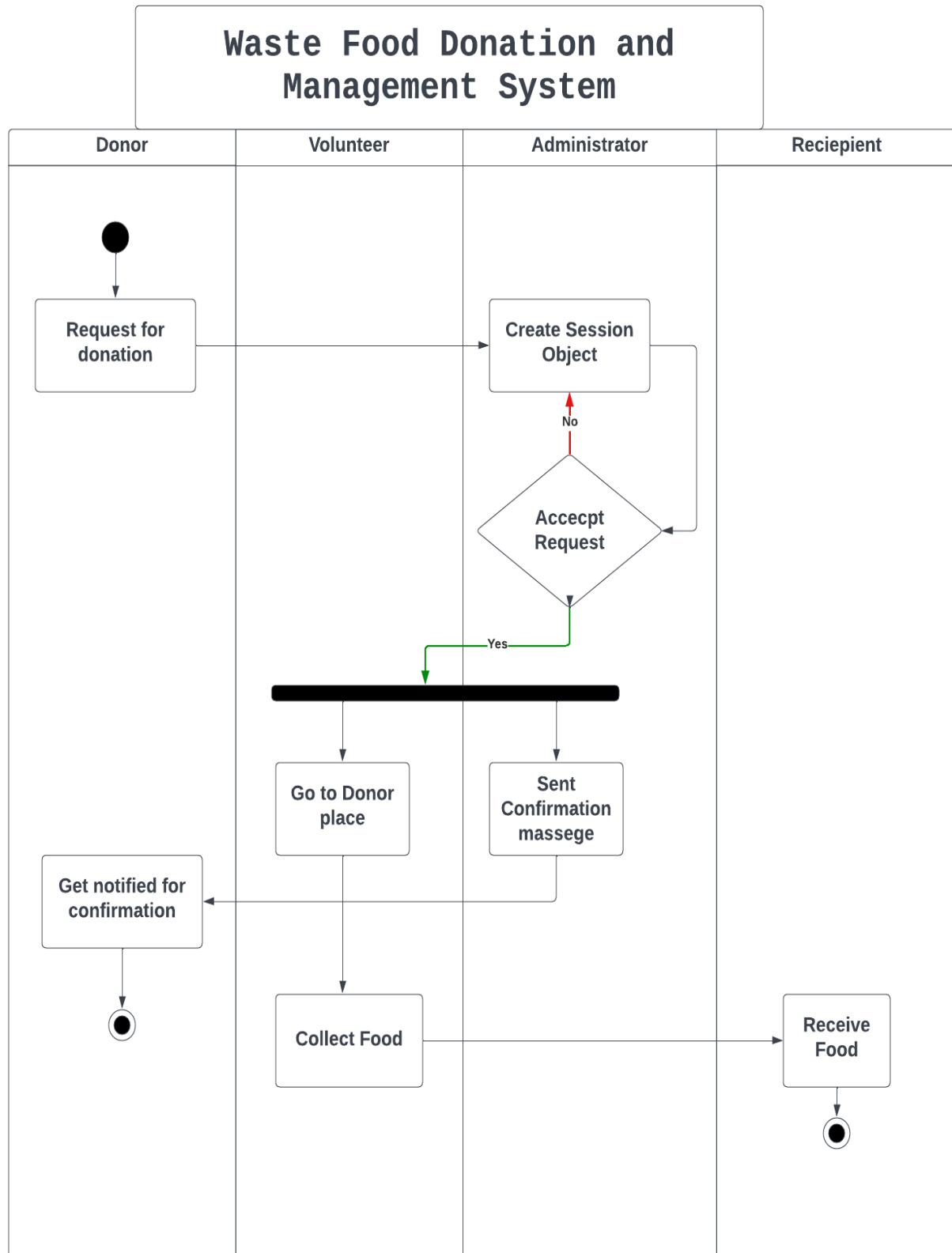
S #	Prerequisites:
1	The administrator is logged into the system.
2	

S #	Test Data
1	Userid = admin123
2	Pass = dfje7b@477

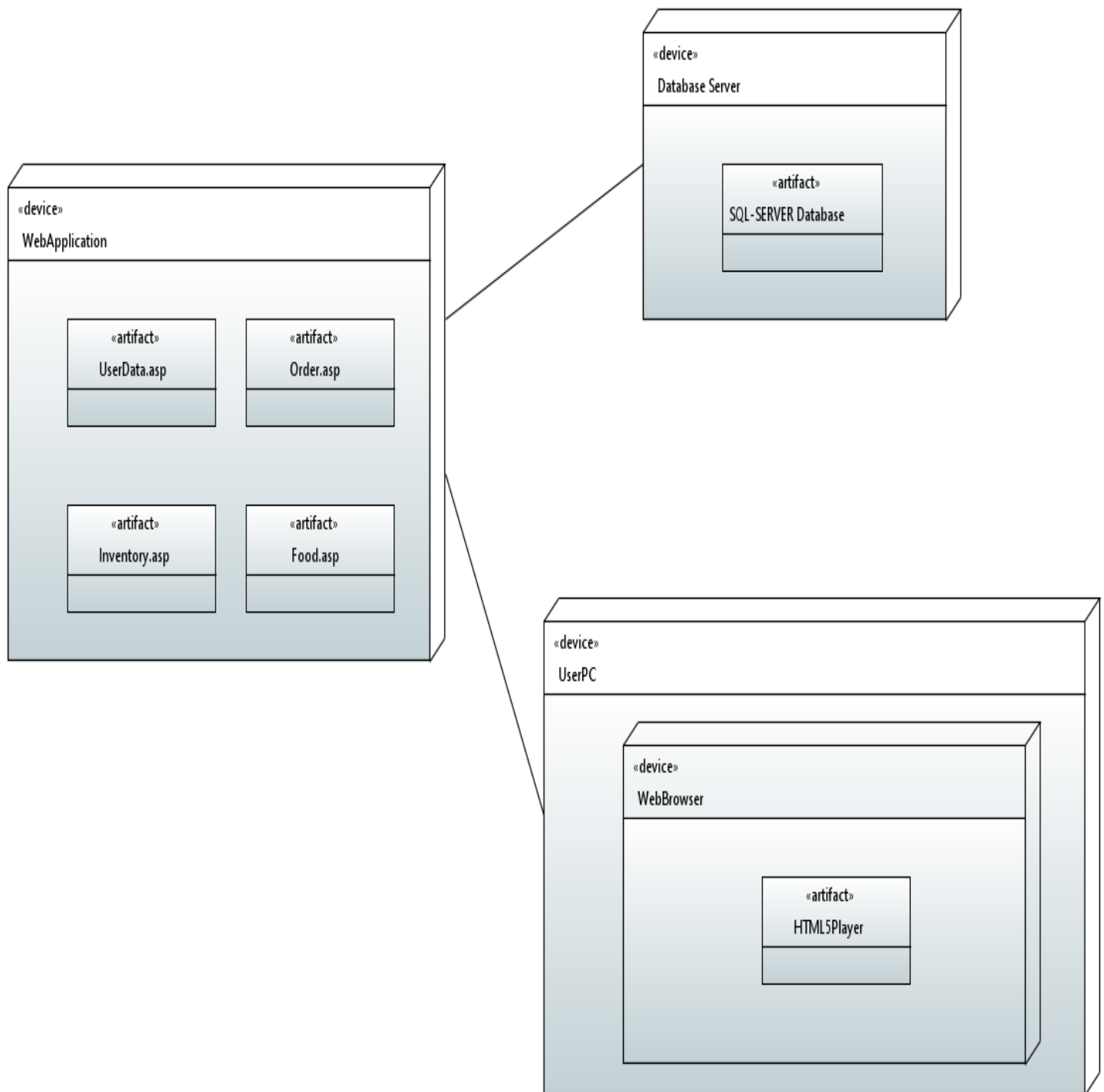
Test Scenario	Verify that the administrator can successfully manage user accounts within the system.
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Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Administrator navigates to: https://www.figma.com/proto/5heJM1M6UK9XqcHV8oZrHy/Software-Project-(-waste-food-management-and-donation-system)?page-id=0%3A1&type=design&node-id=4-8&viewport=-38%2C530%2C0.12&t=6BVjO24bpzDvvVYN-1&scaling=min-zoom&starting-point-node-id=4%3A8&show-proto-sidebar=1&mode=design.	Administrator successfully navigates to the "User Management" section without encountering any errors.	As Expected	Pass
2	Administrator selects the option to view the list of registered users.	The list of registered users is displayed accurately, and the interface is user-friendly.	As Expected	Pass
3	Administrator saves the changes.	Changes to the user's information are saved successfully.	As Expected	Pass

## 11. Activity Diagram:



## 12. Package Diagram:



## **14. Maintenance Plan:**

Creating a maintenance plan for a waste food management and donation system in software engineering involves various elements to ensure the system is long-term effectiveness, reliability and scalability.

### **1. Regular software updates**

- **Scheduled updates:** implement a regular schedule for software updates to keep the system updated with security patches, new features and improvements.
- **Version Control:** Maintain a clear version control system to track changes and roll back if needed.
- **Compatibility Testing:** Test updates for compatibility with different devices and operating systems to ensure seamless operation.

### **2. Monitoring and Alerts**

- **Performance Monitoring:** use monitoring tools to track system performance, including response times, server load and database health.
- **Error Detection:** Implement automated error detection and alert systems to notify the maintenance team of any issues.
- **Data security:** Continuously monitor data security to protect sensitive information such as user data and donation details.

### **3. Database Management**

- **Regular backups:** Schedule regular backups of the system's database to prevent data loss.
- **Data Cleansing:** Implement data cleansing routines to remove outdated or unnecessary data, ensuring database efficiency.
- **Database optimization:** optimize database queries and structures for improved performance.

### **4. User support and feedback**

- **Help desk support:** provide a help desk or customer support system to assist users with technical issues.
- **User feedback mechanisms:** Implement mechanisms for users to provide feedback, allowing for continuous improvement.
- **Training and Documentation:** offer user training and maintain updated documentation to help users navigate the system.

## 5. Hardware and Infrastructure

- **Infrastructure maintenance:** Ensure hardware and infrastructure components are regularly maintained and upgraded as needed.
- **Scalability planning:** plan for scalability to accommodate growth in user base and data volume.
- **Redundancy and failover:** Implement redundancy and failover systems to ensure high availability.

## 6. Continuous Improvement

- **Feedback loops:** Create feedback loops between users, developers and the maintenance team to identify areas for improvement.
- **Feature request:** implement a system for managing feature requests and prioritizing them based on user needs.
- **Quality assurance:** conduct regular quality assurance tests to ensure the system meets performance and usability standards.