Food Waste Management System - Specification Document

1. Introduction

The Food Waste Management System is a web-based platform designed to interconnect Restaurants, NGOs, and Volunteers to minimize food wastage and redistribute surplus food to people in need. The system provides a seamless way to track food donations, manage logistics, and ensure timely delivery to beneficiaries. This specification document outlines the functional and non-functional requirements, architecture, and system features of the project.

2. Objectives

- Reduce food wastage by creating a collaborative ecosystem. - Facilitate easy communication between Restaurants, NGOs, and Volunteers. - Ensure transparency and accountability in food distribution. - Provide a scalable and user-friendly platform for real-world impact.

3. System Overview

The system is divided into three major user roles: 1. **Restaurants**: Register surplus food details, availability, and pick-up timings. 2. **NGOs**: Accept food requests, validate food quality, and manage beneficiaries. 3. **Volunteers**: Help in logistics by collecting and delivering food from Restaurants to NGOs. The platform provides dashboards, notifications, and reporting mechanisms for efficient management.

4. Functional Requirements

- User Authentication and Role Management (Restaurant, NGO, Volunteer). - Food Donation Submission and Tracking System. - Matching Algorithm for connecting food donors with NGOs based on location and availability. - Volunteer Assignment for logistics support. - Notification System (email/SMS/alerts) for real-time communication. - Reporting and Analytics Dashboard for monitoring donations and deliveries.

5. Non-Functional Requirements

- **Scalability**: The system must handle a growing number of users and donations. - **Security**: Data encryption, secure authentication, and role-based access control. - **Performance**: Real-time updates with optimized queries and minimal latency. - **Usability**: Clean UI/UX design accessible on both desktop and mobile devices. - **Reliability**: Ensure uptime with robust error handling and backup mechanisms.

6. System Architecture

The Food Waste Management System follows a client-server architecture with the following components: - **Frontend**: React.js with responsive design for cross-platform compatibility. - **Backend**: Spring Boot REST API for managing business logic and services. - **Database**: MySQL for structured storage of user data, donations, and logistics. - **Hosting**: Cloud deployment with scalable infrastructure for availability. - **APIs**: RESTful APIs to integrate with

third-party services such as SMS/email notifications.

7. Conclusion

The Food Waste Management System bridges the gap between food surplus sources and people in need. By fostering collaboration among Restaurants, NGOs, and Volunteers, the system contributes towards reducing hunger and promoting sustainability. This specification provides a comprehensive foundation for successful development and implementation of the project.