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Project Proposal: EcoFood Connect

Problem Statement

The United States has a staggering amount of food wastage, with over 133 billion pounds going to waste annually. This only adds to the already huge problem of climate change through increased greenhouse gas emissions and evidences a disconnected society when millions are hungry each day. Restaurants are one of the largest generators of surplus food, but they lack a unified platform to efficiently redistribute their excess food to those in need.

That's where the inefficiency in dealing with food waste and hunger is: coordination among restaurants, food banks, logistics providers, and waste management firms.

Solution

EcoFood Connect is an end-to-end online platform that bridges the gap between restaurants, food banks, logistics companies, and waste management firms. This Java Swing-based software provides an enabling ecosystem for the following activities:

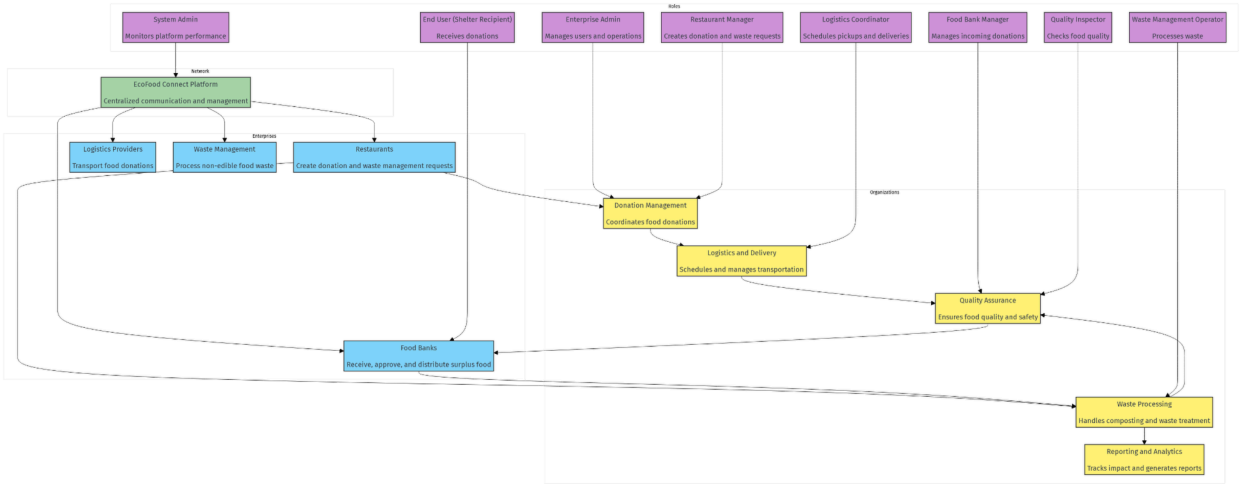
1. **Smoothening the process of food donation.**
2. **Managing the transportation of surplus food.**
3. **Appropriate disposal of non-edible food waste.**

Key Features:

- **Coordination**: Easy coordination between donors and recipients.
- **Efficiency**: Simplifies the process of donating surplus food and managing non-edible waste.
- **Impact**: Track and report metrics including but not limited to food donated, waste reduced, and carbon emissions prevented.

EcoFood Connect ensures that surplus food reaches those in need efficiently while non-edible waste is processed sustainably.

High-Level Component Diagram



Below is an overview of EcoFood Connect's components:

- **Network**: A centralized communication system linking all stakeholders.
- **Enterprises**:
    - Restaurants
    - Food Banks
    - Logistics Providers
    - Waste Management Firms
- **Organizations**:
    - Donation Management
    - Logistics and Delivery
    - Quality Assurance
    - Waste Processing
    - Reporting and Analytics
- **Roles**:
    - System Admin
    - Enterprise Admin
    - Restaurant Manager
    - Logistics Coordinator
    - Food Bank Manager
    - Quality Inspector
    - Waste Management Operator
    - End User (Recipient at shelters).

Ecosystem Hierarchy

1. Network

A unified digital platform acts as the central hub, enabling collaboration among stakeholders.

2. Enterprises

Four key types of enterprises make up the ecosystem:

1. **Restaurants**: Over-produce food and start calling for donations.
2. **Food Banks**: Receive and redistribute surplus food.
3. **Logistics Providers**: Transportation of food donations to food banks or shelters.
4. **Waste Management Firms**: Handle non-edible food waste sustainably.

3. Organizations

Each enterprise has a number of organizations, each responsible for some function:

1. **Restaurant Operations**: Oversee additional food and craft donation requests.
2. **Food Donation Coordinating:** Matching surplus food with sufficient food banks.
3. **Logistics and Delivery**: Pre-plan and deliver on the routes.
4. **Quality Assurance**: Ensuring the quality and safety of the food being donated.
5. **Food Waste Treatment:** Treat non-food items to reduce disposal to landfills.
6. **Reporting and Analytics**: Insights about donation data and environmental impact.

4. Roles

Each of them has some special duty.

1. **System Admin**: Responsible for monitoring the platform for seamless performance.
2. **Enterprise Admin**: User and operation administration within the enterprise.
3. **Restaurant Manager**: Creates and tracks the food donation requests.
4. **Food Bank Manager**: Approving or disallowing the requests for donations and managing coming food.
5. **Logistics Coordinator**: Assigns delivery personnel and schedules pickups.
6. **Quality Inspector**: Inspects the quality of food donations.
7. **Waste Management Operator**: Treats non-edible food waste.
8. **End Consumers**: Get their food donations in shelters.

Use Cases

Use Case 1: Food Donation Request

1. The restaurant signs in to EcoFood Connect and creates a donation request.
    - Information includes the type of food, quantity, date, and preferred time for pickup.
2. Food bank manager checks the application and approves or rejects it.
3. Once accepted, the logistics coordinator will assign a driver for pickup.
4. Food gets to a shelter, and the request gets tagged as "Completed."

Use Case 2: Cross-Enterprise Collaboration

1. These food chains consolidate the excess together for a mega food bank.
2. The admin monitors the collaboration while logistics coordinates multi-point pickups.
3. Food is efficiently distributed to the shelter.

Use Case 3: Waste Treatment

1. Restaurants identify non-food wastes and report in the EcoFood Connect system.
2. The waste management operator processes the waste into compost or energy and updates the system with environmental impact metrics.

Use Case 4: Reporting

1. System administrator generates the following report, which highlights:
    - Total food donated.
    - Environmental impact-smoothing of carbon emissions.
    - Cross-organizational and cross-enterprise collaboration facts.