

Project Report

Title: Local Food Wastage Management System

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Abstract

Food wastage is a growing global challenge, while millions of people still suffer from food insecurity. Restaurants, grocery stores, and households often discard surplus food that could otherwise be redistributed to those in need.

This project, *Local Food Wastage Management System*, aims to bridge the gap between food providers and receivers using a structured digital platform.

The system is built using **Python, SQL, and Streamlit**. Four datasets (providers, receivers, food listings, and claims) were cleaned, normalized, and stored in a relational SQLite database. A set of **15 SQL queries** were designed to analyze food donation trends, claims distribution, and provider/receiver activity. Insights were supported with **EDA visualizations** (bar charts, pie charts, and trend graphs). Finally, a **Streamlit application** was developed to provide CRUD operations, filters, and dashboards for real-time interaction.

The results demonstrate that the platform can effectively reduce food waste, provide transparency in distribution, and empower NGOs and communities to improve food security.

1. Introduction

Food wastage and food insecurity exist simultaneously: while tons of edible food are discarded daily, many individuals and families struggle to meet their dietary needs. Addressing this problem requires **efficient redistribution systems**.

This project provides a **data-driven platform** that connects food providers (restaurants, supermarkets, grocery stores) with receivers (NGOs, shelters, individuals). By leveraging SQL for data management and Streamlit for an interactive UI, the system ensures surplus food is tracked, claimed, and distributed efficiently.

2. Datasets

The project uses four main datasets:

1. Provider Data

- Provider_ID, Name, Type, Address, City, Contact
- Contains details of restaurants, supermarkets, and other donors.

2. Receivers Data

- Receiver_ID, Name, Type, City, Contact

- Includes NGOs, shelters, and individuals who claim surplus food.

3. Food Listings Data

- Food_ID, Food_Name, Quantity, Expiry_Date, Provider_ID, Provider_Type, Location, Food_Type, Meal_Type
- Tracks available food items with type and expiry details.

4. Claims Data

- Claim_ID, Food_ID, Receiver_ID, Status, Timestamp
- Records claims made by receivers and their statuses (Pending, Completed, Cancelled).

3. Methodology

The project followed a structured pipeline:

1. Data Cleaning

- Fixed inconsistent labels (e.g., "Bread" incorrectly marked as Non-Vegetarian).
- Converted dates into standardized formats.
- Removed duplicates and standardized city/food names.

2. Database Creation

- Designed SQLite schema with foreign keys and indexes.
- Loaded cleaned datasets into tables: provider_data, receivers_data, food_listings_data, claims_data.

3. SQL Queries (15)

- Analyzed provider/receiver distribution, claims performance, and food wastage trends.

4. EDA (Exploratory Data Analysis)

- Bar charts: Providers & Receivers by City, Claims by Status.
- Pie chart: Food Type distribution.
- Line chart: Claims trend over time.

5. Streamlit Application

- Interactive UI with filtering (city, food type, meal type).
- Dashboards for all 15 SQL queries.

4. Results and Insights (SQL Queries)

Q1. Providers & Receivers per City

Cities like West Christopher showed both high provider and receiver presence, making them ideal redistribution hubs.

Q2. Top Provider Types

Supermarkets and Grocery Stores contributed the largest share of surplus food.

Q3. Provider Contacts by City

Enabled NGOs to directly reach providers for faster food collection.

Q4. Top Receivers by Claimed Quantity

Certain NGOs consistently and Scott Hunte, William Frederick are claimed large volumes, showing active participation.

Q5. Total Quantity Available

The system tracked all surplus food in one place, showing significant amounts 25794 units available for redistribution.

Q6. City with Most Listings

Highlighted areas where food redistribution networks are strongest.

Q7. Common Food Types

Vegetarian and Vegan items dominated, with corrections made for mislabelled foods.

Q8. Claims per Food Item

Popular items like chicken and *Soup* had the highest claim counts.

Q9. Provider with Most Successful Claims

Barry group and miler inc the most reliable donors whose contributions were regularly distributed.

Q10. Claims by Status

Most claims were completed(33.9%) successfully, though some were pending or cancelled(66.1).

Q11. Average Quantity Claimed per Receiver

Showed the efficiency of receivers in utilizing available donations.

Q12. Meal Type Most Claimed

breakfast and *Lunch* donations had the highest demand.

Q13. Total Donated by Provider

Ranked providers by their generosity and impact.

Q14. Number of Food Listings and Claims Over Time

Helped track and reduce wasted food by identifying items past expiry.

Q15. Cities with the Highest Number of Food Listings

helping prioritize cities with high claim ratios.

5. Visualizations (EDA)

- **Providers & Receivers by City (Bar Chart)** → Clear donor-receiver balance across cities.
- **Food Type Distribution (Pie Chart)** → vegan and vegetarian items dominated after cleaning.

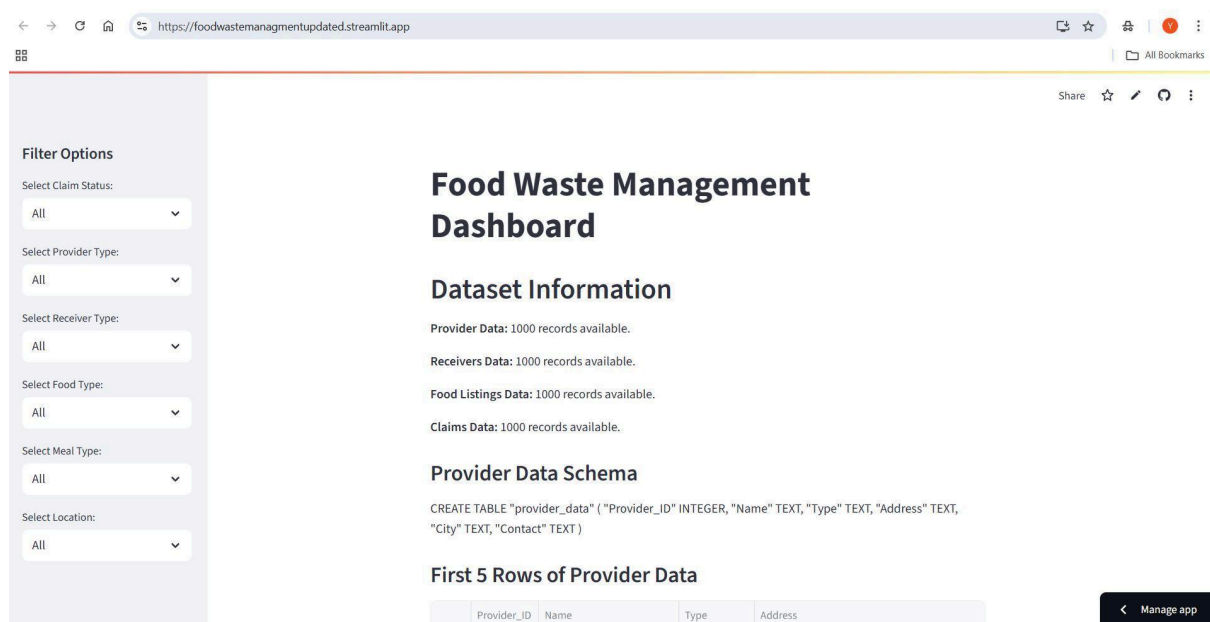
- **Claims Status (pie Chart)** → Completed claims were the majority.
- **Top Providers (Bar Chart)** → Identified leading contributors.

6. Streamlit Application

The Streamlit app provided:

- Filters for city, provider, food type, meal type.
- Dashboards for 15 SQL queries.
- Contact details display for collaboration.

Link :- <https://foodwastemanagmentupdated.streamlit.app/>



7. Conclusion

The *Local Food Wastage Management System* successfully demonstrated how SQL + Streamlit can be combined to build a real-world solution for food redistribution. By connecting surplus food providers to receivers, the system reduces waste and supports communities in need.
