# CSIS 4495 - Applied Research Project

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# Written Project Plan Proposal and Contract Review

### 1.0 Title Page

**Project Title:** Cultivating Connections: A Community-Driven Platform for Local Food Waste Reduction

**Team Member:**

* Frederick K. Okornoe - Project Lead

**Course and Section:** CSIS 4495 - Applied Research Project, Section 001

### 2.0 Introduction

#### 2.1 Domain Overview and Background

Food waste is a significant global challenge with far-reaching environmental, economic, and social consequences. According to the Food and Agriculture Organization of the United Nations, approximately **one-third of all food produced** for human consumption is lost or wasted globally, amounting to 1.3 billion tons per year. This waste contributes to greenhouse gas emissions, squanders resources like water and land, and represents a missed opportunity to address food insecurity. While large-scale initiatives exist to connect commercial food surpluses with food banks, a significant portion of waste occurs at the **household level**, which is often unaddressed by these solutions.

#### 2.2 Problem Framing

The central problem this research aims to address is the lack of a user-friendly, community-centric, and scalable solution for managing and redistributing household food surpluses. Individuals often find themselves with excess foodwhether from over-purchasing, travel, or garden abundance that they are unable to consume before it spoils. Currently, there is no organized and convenient mechanism for these individuals to connect with others in their immediate community who could use the food. This results in **unnecessary waste** and perpetuates a **disconnect between food surplus and food insecurity** at a hyper-local level.

#### 2.3 Literature and Research Summary

Existing research and platforms have explored various approaches to food waste. Commercial apps like "Too Good To Go" focus on connecting consumers with restaurant and retail food surpluses. While effective, these models do not address the substantial volume of waste from individual households. Local food banks and pantries are critical, but their operational models are often centralized and rely on large donations, which may not be accessible for small-scale household sharing. This research aims to bridge this gap by creating a platform that leverages the principles of the **sharing economy** and **social networking** to empower individuals to be part of the solution directly. This approach is supported by emerging research on the role of digital platforms in fostering pro-social and sustainable behaviors within communities.

#### 2.4 Hypotheses and Assumptions

The primary hypothesis is that a user-friendly, community-driven digital platform will **significantly reduce household food waste** within a defined community. It is assumed that individuals are willing to share their surplus food if the process is simple, convenient, and built on a foundation of trust. It is also assumed that a local network effect will take hold, where increased participation will make the platform more valuable for all users, leading to a self-sustaining cycle of waste reduction.

#### 2.5 Potential Benefit

The development of this platform has the potential for a direct and measurable positive impact. By facilitating the exchange of surplus food, it will contribute to a more **sustainable local food system**, reduce environmental impact, and **enhance food security** by making food more accessible to those in need. Furthermore, the platform will foster a **stronger sense of community** and social cohesion by encouraging residents to interact and collaborate on a shared goal.

### 3.0 Proposed Research Project

#### 3.1 Research Design and Objectives

The research design is an **applied research project**, focusing on the development and validation of a functional prototype. The core objectives are to:

1. **Design and Develop:** Create a minimalist, intuitive, and mobile-responsive web application with a focus on ease of use for listing and claiming food items.
2. **Pilot Study:** Launch the platform in a small, targeted community (e.g., a specific neighbourhood) to test its functionality and gather user feedback.
3. **Data Collection and Analysis:** Monitor platform usage metrics (e.g., number of transactions, user activity) and collect qualitative data through user surveys to assess the platform’s effectiveness and user satisfaction.

#### 3.2 Methodology and Justification

This project will follow an **Agile development methodology**, allowing for continuous feedback loops and iterative improvements based on pilot study data.

* **Data Collection:**
  + **Quantitative:** Platform analytics will be used to track key performance indicators such as the number of listings, claimed items, and active users. This data will provide objective evidence of the platform’s adoption and usage.
  + **Qualitative:** A pre-pilot and post-pilot survey will be administered to participants to gauge their awareness of food waste, their sharing habits, and their experience with the platform. This will provide valuable insights into user satisfaction and the social impact of the tool.
* **Data Analysis:** Quantitative data will be analyzed using statistical methods to identify trends and measure the platform's impact. Qualitative data from surveys will be analyzed thematically to uncover user insights and areas for improvement.

#### 3.3 Technologies

* **Operating System or Platform:** Google Cloud Platform (GCP) for hosting and scalable backend services.
* **Programming Language/Scripting or Framework:** **React.js** for the component-based frontend and **Node.js** for the backend logic.
* **Database:** **Firebase's Firestore**, a NoSQL database, for its real-time data synchronization capabilities, which is crucial for a live sharing platform.
* **Front-end and Backend:** The front-end will be a single-page application built with React, and the backend will be a simple API hosted on GCP that interacts with Firestore.

#### 3.4 Expected Results

The project is expected to produce a **fully functional prototype** of the "Cultivating Connections" platform. The pilot study will yield a detailed report on user engagement and preliminary insights into the platform's effectiveness in reducing food waste. This research will contribute a practical, **open-source model** for community-driven waste reduction that can be replicated and scaled in other communities. The findings will provide a foundation for future work.

#### 3.5 Riipen External Partners or affiliates

No external Riipen partner is associated with this project.

### 4.0 Project Planning and Timeline

**Project Member Responsibilities:**

* **Frederick Okornoe:** Full responsibility for project management, literature review, system design, frontend and backend development (React/Node.js/Firestore), data collection, and final report compilation.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Milestone** | **Deliverables** | **Start Date** | **End Date** | **Responsible** |
| **Phase 1: Research & Planning** | Proposal Submission | Sept 4, 2025 | Sept 15, 2025 | Frederick |
|  | Literature Review & System Design | Sept 16, 2025 | Sept 30, 2025 | Frederick |
| **Phase 2: Development** | Database Schema & Backend Setup | Oct 1, 2025 | Oct 15, 2025 | Frederick |
|  | Frontend UI/UX Mockups & Prototype | Oct 1, 2025 | Oct 30, 2025 | Frederick |
|  | Core Platform Features (Listing/Claiming) | Nov 1, 2025 | Nov 15, 2025 | Frederick |
|  | **Midterm Report** | Nov 15, 2025 | Nov 20, 2025 | Frederick |
| **Phase 3: Testing & Reporting** | Pilot Group Onboarding & Testing | Nov 21, 2025 | Dec 5, 2025 | Frederick |
|  | Data Collection & Analysis | Dec 6, 2025 | Dec 15, 2025 | Frederick |
|  | Final Report & Presentation Prep | Dec 16, 2025 | Dec 20, 2025 | Frederick |

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### 5.0 Project Contract

I, the undersigned, agree to the scope of work and timeline outlined in this proposal. I commit to dedicating the necessary time and effort to complete this project to the best of my abilities, adhering to the project plan and all academic integrity policies.

*Signed*

**Frederick Okornoe**

### 6.0 Work Logs for Student

**Student Name:** Frederick Okornoe

|  |  |  |
| --- | --- | --- |
| **Date** | **Number of Hours** | **Description of work done** |
| Sept 4, 2025 | 2.5 | Initial brainstorming and research for project ideas. Conducted preliminary research on food waste platforms. |
| Sept 5, 2025 | 1.0 | Drafted the Project Proposal Title Page and Introduction sections. |
| Sept 8, 2025 | 2.0 | Outlined Proposed Research section, defining methodology and technology stack. |

### 7.0 Closing and References

#### 7.1 Acknowledgements

I would like to thank Professor Bambang A.B. Sarif and my peers for their guidance and support throughout the planning phase of this research project.

#### 7.2 References

1. Food and Agriculture Organization of the United Nations. (2011). *Global food losses and food waste - Extent, causes and prevention*.
2. Filieri, R., et al. (2020). *The Role of Sharing Economy Platforms in Shaping Sustainable Consumption*. Journal of Business Ethics, 162(2), 345–361.
3. Lee, H., & Lee, J. (2018). *A social perspective on food waste management*. Journal of Cleaner Production, 180, 283–291.