LAB 2 - LIVELYSHELFS PRODUCT SPECIFICATION

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1 Introduction

1.1 Purpose

Livelyshelfs is a web application designed to manage household food items to reduce excess waste and spoilage. This document ensures effective communication among stakeholders by serving as a reference for the planning, development, testing, and maintenance phases of the project. It also establishes a shared understanding of the system's functionality and constraints.

The first interface users interact with is the login screen where they can create or sign into their user account. The second interface would be a display dashboard giving access to tabs for inventory, calendar, data display, shelf friends and settings. The inventory tab will display information of what food items the user currently has in stock, the quantity, and the date of purchase. The user can manage their food items by adding into the inventory what they recently purchased or delete the quantity that is consumed, spoiled, or given away.

Continuing to the calendar tab, the user can access a visual display of information pertaining to the food expiration date and the status of the item when it’s near spoilage. The calendar can be traversed across dates to access information on food items and their status of expiration. Another tab feature would be data visualization, users can view information on item usage, when the food was purchased, quantity and spoilage. The analysis allows users to have a perspective on spending and consumption habits.

The final feature would be the shelf friends tab, where users can communicate with other account holders within their local community to either request or offer food from their own inventory stock. Users can add one another into a list called friends and interact through direct message or create a group chat. Livelyshelfs can’t purchase food items for the user and does not

store any financial information. The web application is intended to help households ease one of the burdens from their daily lives with a management system and not to set up businesses on the app by other users to sell food.

1.2 Scope

Livelyshelfs will provide features that can help households reduce food waste and cost with a tracking and inventory system displayed in a visually appealing manner for easy comprehension.

Some of the key features will be the web application having an inventory tab where the user can manage what food to add or remove based on purchase, spoilage, and consumption. Users will also be able to filter and look for certain food items within their inventory for availability before going to purchase them at the store. Another feature would be the calendar tracking system with dates when food items will go bad with statuses showing how close the food is to being spoiled. This relieves the pressure put on the users to try and remember every expiration date, food quantity, and item tracking. The community feature allows users to communicate with their local neighborhood users to exchange or give food away instead of discarding them.

1.3 Definitions, Acronyms, and Abbreviations

API: Also known as "Application Programming Interface" it is a protocol that allows for different software applications to communicate with one another.

Community Hub: A part of LivelyShelfs that helps bring the community together and allows user interaction to share sustainable habits and tips.

Database: An organized collection of information stored electronically.

Food Insecurity: Not having access to enough food to meet one's needs or not being able to access quality food to meet one's needs.

Food Waste: Food that isn't used for its intended purpose or is not used before spoiling.

GitHub: A service that allows developers to collaborate on the development of projects and provides version control.

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JUnit: A testing framework for Java.

Landfills: A site where waste is disposed of, typically the waste is covered by soil.

Spoilage Calendar: An efficient and intuitive calendar provide by LivelyShelfs that notifies users of when their food is going bad

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Sustainability: A goal to avoid actions that harm the environment or deplete natural resources while still meeting one's needs.

Trello: A service that helps with project management and planning.

VSCode: Also known as "Visual Studio Code" it is a development environment used by the team that is compatible with many different languages.

Web Application Framework: Software platform intended to help developers in building web applications, providing access to pre-built tools and libraries.

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1.5 Overview

Livelyshelfs product specification within the following sections will lay out the major functional components, hardware, software, interfaces, and product functions for the prototype in great detail. The web application's presentation, web, and database layer will explain the process of information interacted between the client and the server side with user interaction. Another would be the functionalities of the login, inventory, and waste management system that would be shown with informative description.

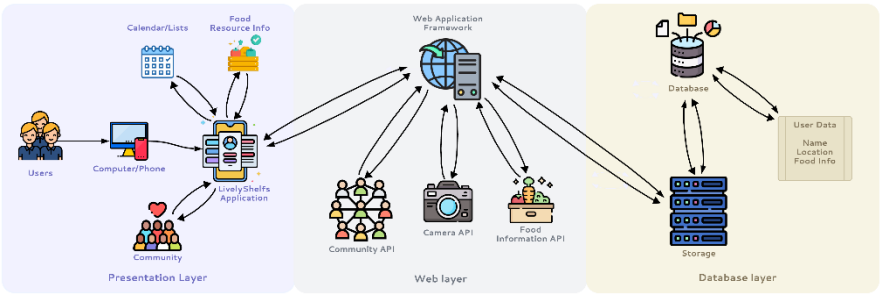
2 Overall Description

2.1 Product Perspective

The hardware aspect would be the user accessing the application through the computer. Photos can be taken on a food or inputted manually on the user's device. The data would be stored on a local server to keep track of all inventories and the calendars. The software aspect would be the development tools such as Javascript, Node.js, Mocha, Vite and React with the first being the chosen language to interact with framework between frontend and backend. The framework would be utilizing Node.js and Mocha for unit testing and allowing pull requests and communication for web application. The database would be constructed in MySql and the front-end for user interface would be JavaScript, HTML, and CSS for a friendly and functional user interface.

Figure 1:

Major Functional Components Diagram



The three-tier architecture within our design are the presentation, web, and the database layers of our software. The presentation layer as shown in Figure 1 is what the user will interact with the application. The web layer would handle the process and connections between the presentation and the database in information handling. The database layer would handle the data storage and queries for the user inputs.

The development tools utilized in the construction of our front-end of the application consist of JavaScript, HTML, and CSS. The Web Layer would utilize the development tools Javascript and Python for the back end to retrieve and process user input. HTML and CSS will allow for a visually aesthetic design for the user experience and Javascript would make the interactions functional for use. There would be partial implementation of a Web Crawler/Information API which would allow for retrieval of data and accessing the web to give the most accurate information on the food item given. LivelyShelfs would also have a recommendations algorithm where the tracked food can be analyzed.

The database layer would be handled my MySQL for data storage and retrieval based on the needed data within the local server. The establishment of the database will store all necessary

information needed to be accessed for user account, food item inventory and tracking system as the main focus of functionality for the web application.

2.2 Product Functions

Table 1:

Table of Comparison Between RWP and Prototype

Category	Features	Real World Product	Prototype	Reasoning
Account Management	Login/ Authenticate	Fully Functional	Partially Implemented	Limited time will not be dedicated to basic functionalities
	Location Usage	Fully Functional	Partially Implemented	Limited time will not be dedicated to basic functionalities
	Account Creation / Deletion	Fully Functional	Partially Implemented	Limited time will not be dedicated to basic functionalities
	Add / Remove Friend	Fully Functional	Fully Functional	
	Add / Remove Member	Fully Functional	Eliminated	Limited time will not be dedicated to basic functionalities
Inventory Management	Add / Remove Item	Fully Functional	Partially Implemented	Implement manual input, implement camera if we have time
	Track Item Expiration	Fully Functional	Fully Functional	
	Mark Items Shareable	Fully Functional	Fully Functional	
	Quantity Viewing	Fully Functional	Fully Functional	
	Purchase History	Fully Functional	Eliminated	Limited time and not an innovated feature
	Inventory History	Fully Functional	Eliminated	Limited time and not an innovated feature
Proactive Waste Management	Predictive Waste Analysis	Fully Functional	Fully Functional	Limited test data
	Shelf Friends Sharing	Fully Functional	Fully Functional	
	Recipe Recommendations	Fully Functional	Partially Implemented	Limited time will not be dedicated to web crawler functionalities
	Incentives	Fully Functional	Partially Implemented	Limited time will not allow for full reward
	Data Visualization	Fully Functional	Partially Implemented	Limited test data
	Sharing Analytics	Fully Functional	Partially Implemented	Limited test data

The main features that will be implemented for the Livelyshelf prototype would be the account, inventory, and proactive waste management. The account login authentication and account creation will be partially implemented due to time constraints while the add/remove friends feature will be fully implemented. The ability to remove a member is eliminated as it can be utilized similarly to the friend function. The item expiration tracking, quantity viewing and food marked sharable will be fully implemented and displayed with the inventory and calendar tabs. The inventory and purchase features were discarded due to not being innovative features and not necessary for analysis.

The predictive waste analysis will be fully functional along with the shelf friends sharing feature for predictive waste management but tested on limited data. The recipe recommendations feature will be partially implemented due to time constraints and not be dependent upon the web crawler functionalities. The incentives features would also be partially implemented for the same reason of limited time. Lastly, the data visualization and sharing analytics will be partially implemented for the prototype due to limited test data from the users.

2.3 User Characteristics

The target audience of Livelyshelfs are household members who seek a practical solution for managing food items within their inventory and waste reduction. These users are expected to have beginner to moderate levels of technical expertise, ranging from basic computer literacy to average web application experience. While the system is designed to be accessible for age groups of late teens and older, it particularly caters to individuals or families looking to improve the efficiency of their food management processes. Users might access the application daily to update inventory or review expiration dates, or less frequently for features like data analysis and social interactions. For the accessibility features, such as friendly user interface, ensure that the application accommodates users with minimal technical skills as well as those requiring support for diverse needs.

Additionally, users may also interact with Livelyshelfs for community-oriented purposes, such as food-sharing through the "Shelf Friends" feature. This means the system should accommodate users who value social interaction and community engagement. For example, the messaging capabilities are tailored for individuals willing to offer or request food items. The application is intended for personal use rather than business so no individual can try to sell their

items. These characteristics emphasize the diverse needs of the user base, ranging from individual households to small, interconnected communities.

2.4 Constraints

N/A

2.5 Assumptions and Dependencies

N/A