Lab 1 – LivelyShelfs Product Specification

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1 Introduction

1.1 Purpose

The purpose of this SRS document is to provide a clear guideline on the functionality of the LivelyShelfs product. In addition to this it should display the reach of the LivelyShelfs product in relation to the problem of food waste and how specific features will have a reducing effect on food waste. This document is written for the LivelyShelfs development team and any other developer who are looking for a glimpse into the development process of the application. It should be used to aid the group in development as a team and as a clear path for what features will and will not do.

1.2 Scope

LivelyShelfs will aid individuals and families in reducing their household food waste by providing a simple and easy to use food management system. This will require that a majority of features thought of in planning be implemented, with some features being partially implemented or simulated in the prototype for time's sake.

LivelyShelfs prototype will provide a food inventory, allowing users to view what foods they have and how close to spoiling they are. Inventory management will come in the form of adding and removing food items. In addition to this, users' data on how the use food will be analyzed in order to provide predictive waste analysis, a tool that will help proactively reduce food waste by noticing trends in food waste and then notifying users of them. Predictive waste analysis aims to prevent food waste before it gets the chance to occur. Along with this there is data visualization which will also be based on user food usage trends. Data Visualization will provide users with charts that display how much food they have used/wasted. Shelf friends will allow users to add trusted people into their friends list, enabling food sharing between them. The

features listed above will help LivelyShelfs be a useful tool for reducing food waste and saving money.

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

The remainder of the Software Requirement Specification document will provide an overall description of the LivelyShelfs prototype. There will be an outline of the prototype, its features, and how the parts of the prototype interact with each other. The main functions will be discussed in depth, with a mention of smaller sub-features. User roles and constraints will be outlined, along with potential product constraints, and package dependencies and software frameworks. Section 2 will describe what the LivelyShelfs team is building and the main features of the prototype, user constraints, and project dependencies.

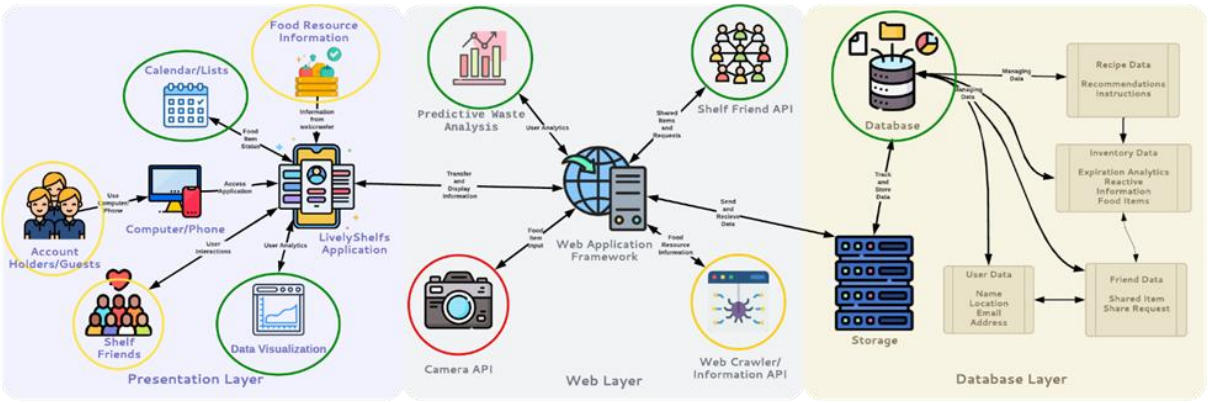
2 Overall Description

2.1 Product Perspective

A majority of prototype functionality will be made via custom API implementation. The database is currently being hosted locally via MySQL. The architecture is based on a three-layer system. The three layers are the presentation layer which encompasses the frontend of the application, the web layer containing the backend of the application, and the database layer which includes the database of the prototype. The three-layer architecture can be seen in Figure 1 below.

Figure 1:

1 LivelyShelfs Prototype MFCD



The presentation layer will house the user interface of the prototype, developed with React and Vite. JavaScript, HTML, and CSS will be used to write the frontend components and functions that make up the UI. The web layer houses the backend which makes use of JavaScript and the Express framework to write functionality for prototype features. The database layer is where user data is stored, retrieved, and manipulated. The database layer is built using MySQL.

2.2 Product Functions

A majority of the functions intended for the real-world product will be included in the prototype, with key features being fully implemented and some less unique features being partially implemented. Fully implemented features in the prototype include item expiration tracking, inventory management (adding and removing food from one's inventory), Predictive waste analysis, Shelf Friends Food Sharing, and adding/removing friends. See Figure 2 below for a complete overview of all features and their planned level of implementation.

Figure 2:

2 LivelyShelfs RWP vs Prototype Table

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 partially implemented features include login and account functionality as focus will be more towards unique features that help reduce food waste. Adding extra account members, purchase and inventory history will all be removed due to time constraints in prototype development. Recipe recommendations, account incentives, data visualization, and sharing analytics will all be partially implemented. This is due to generation/simulation of test data for this functionality instead of real user data.

2.3 User Constraints

The feature allowing for adding additional account members, originally intended to allow for all household members to be able to access the same LivelyShelfs account has been removed in favor of focusing on more key features. Therefore, user roles are currently unapplicable to the LivelyShelfs prototype. A minimal level of expertise is expected of users with the prototype requiring just a simple knowledge of food the user consumes and the ability to enter it into the

applications inventory. Users will enter their food into inventory when purchased and remove or mark the food as used as time goes on. After analyzing users' food use the prototype will respond with visualization of their food use data and recommendations of how to reduce food waste if necessary.

2.4 Constraints

N/A

2.5 Assumptions and Dependencies

The LivelyShelfs prototype relies on multiple development tools and software. The frontend of the application is being developed with Vite and React. Vite is serving as a build tool for the frontend of the application while React is the frontend library. The project is being developed in JavaScript, in the backed Express is being used for a framework. Testing is being implemented with Mocha as a testing framework. NodeJS is being used as a development runtime environment with reliance on NPM for package installation and running development versions of the prototype. Git is being used as version control along with VScode as an IDE. So far, all API development has been built by the team with future API implementation to be determined.