Lab 1 – LivelyShelfs Product Description

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1 Introduction

Food waste is a significant and ongoing global issue that affects us financially, environmentally, and socially. In the US alone, 66.2 million tons of food waste were generated in 2019 (EPA, 2019). This waste can come from food that is left uneaten or spoiled, as well as from mishaps in the production process. Households are one of the leading producers of food waste, accounting for 40% of the total, highlighting the need for better management and awareness (EPA, 2019).

Globally, the monetary loss due to food waste is estimated to be around $940 billion annually, with the US responsible for $218 billion of this total (Shapiro, 2024). The average American consumer spends approximately $1,300 per year on food that ends up being wasted (Berard, 2020). This financial loss could be mitigated with a proactive approach to reducing food waste. Food waste not only leads to economic losses but also exacerbates other societal issues such as hunger and malnutrition. Despite the vast amount of food wasted annually, 783 million people were affected by chronic hunger in 2022 (Move for Hunger, n.d.).

The resources used to produce and transport food, such as water and energy, are also wasted when food is discarded. Agriculture accounts for 70% of global water usage, and the destruction of ecosystems to create farmland further harms the environment (Lewis, 2022). When food waste accumulates in landfills, it negatively impacts the environment by contributing to pollution and greenhouse gas emissions. The mass production and waste of food, coupled with the resulting environmental damage, creates a complex issue that requires urgent attention.

Food insecurity is a parallel problem to food waste. In 2023, 2.3 billion people experienced moderate to severe food insecurity, and in 2022, 2.8 billion people could not afford healthy diets,

with a significant portion from lower-income countries (World Health Organization, 2024). The mass production of food and its subsequent waste aggravate food insecurity. The challenges of reducing food waste and addressing food insecurity are multifaceted. Many existing solutions are not user-friendly and can be difficult for busy households and individuals to adopt. Without effective tools, it is hard for users to track food spoilage, save money, and promote sustainable practices. Additionally, there are few platforms that encourage community sharing of food to prevent waste and support those in need. Many people lack the knowledge and resources needed to preserve food and reduce waste, and users often struggle to understand their food waste patterns and the financial impact due to a lack of clear visualization. Reducing food waste and insecurity often requires collective effort, but there are limited ways to connect with others to share food and support each other. In face of such a significant issue with far-reaching impacts, LivelyShelfs can play a crucial role in successfully addressing these problems.

2 Product Description

LivelyShelfs is an innovative and user-friendly mobile application designed to help busy households and individuals manage their food inventory, reduce waste, and make greener decisions. The app provides proactive tools to minimize food waste, save money, and promote sustainable practices. Users can track the shelf-life of their groceries through a calendar and list, receive recommendations on how to use food before it spoils, and connect with others to share excess food and resources. LivelyShelfs also suggests recipes for items that are about to spoil and encourages community sharing to prevent waste. It offers educational resources on food preservation and environmentally friendly practices. Users can visualize their food waste patterns and monetary savings, helping them understand their impact and make informed decisions.

With LivelyShelfs, households can lower emissions, save money, and contribute to a more sustainable and equitable world. The primary goal of LivelyShelfs is to minimize food waste, thereby contributing to environmental sustainability and addressing food insecurity. By fostering a community focused on reducing food waste and combatting food insecurity, LivelyShelfs

promotes a more sustainable and equitable world.

2.1.1 Key Product Features and Capabilities

LivelyShelfs offers a comprehensive suite of features designed to tackle the issue of household food waste effectively. One of the standout features is the Spoil Calendar and List, which helps users keep track of the spoilage dates of their food items. This feature ensures that users are aware of what needs to be consumed soon, thereby reducing the likelihood of food going to waste. Users can input groceries through various methods, including manual entry, scanning receipts, or using the phone camera to recognize items. This flexibility makes the input process quick and easy, accommodating different user preferences and ensuring that the app remains user-friendly.

The Informational Resources provided by LivelyShelfs are another critical component. These resources educate users on how to keep groceries fresh, prevent spoilage, and make environmentally friendly decisions. By offering tips and best practices, LivelyShelfs empowers users to take proactive steps in managing their food more effectively. Additionally, the app's Recommendations feature suggests recipes and actions based on the spoilage dates of groceries. This encourages users to use food before it goes bad, promoting a more sustainable approach to meal planning and consumption.

A unique aspect of LivelyShelfs is its Community Hub, which allows users to share

food and resources with others in their community. This feature fosters a collaborative effort to reduce waste, as users can connect with neighbors to share excess food, thereby preventing it from being discarded. The Community Hub not only helps reduce food waste but also supports those in need, creating a sense of community and mutual support.

What makes LivelyShelfs significant and innovative is its holistic approach to addressing food waste. By combining practical tools for tracking and managing food with educational resources and community engagement, LivelyShelfs tackles the problem from multiple angles. This comprehensive strategy ensures that users have the knowledge, tools, and support they need to make a meaningful impact on reducing food waste. LivelyShelfs addresses the societal problem of food waste by providing a user-friendly platform that integrates seamlessly into daily life. The app's features are designed to be intuitive and accessible, making it easy for users to adopt sustainable practices. By reducing food waste, LivelyShelfs not only helps users save money but also contributes to environmental conservation and food security. The app's emphasis on community sharing further amplifies its impact, as it encourages collective action and fosters a culture of sustainability.

In summary, LivelyShelfs offers a detailed and multifaceted solution to the problem of household food waste. Its innovative features, user-friendly design, and focus on community engagement make it a significant tool in the fight against food waste. By addressing the issue from various perspectives, LivelyShelfs provides users with the resources and support they need to make a positive change.

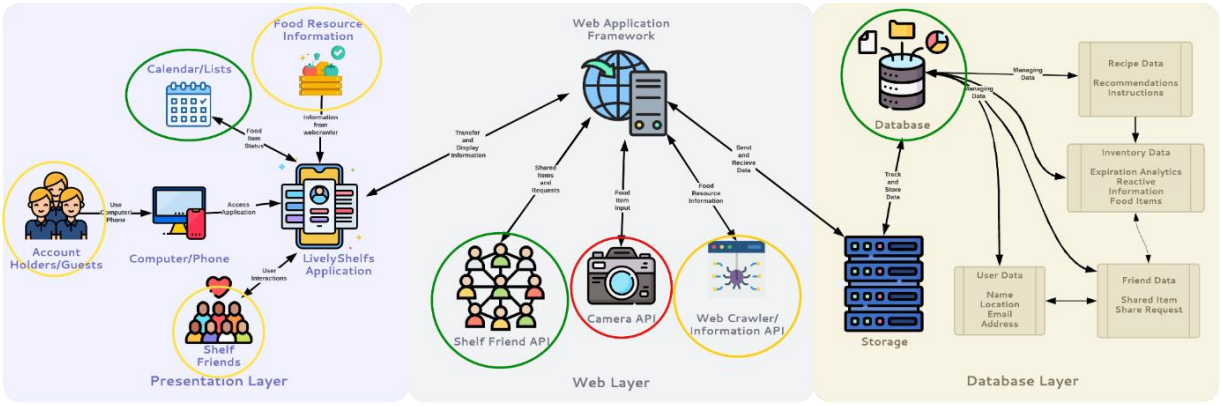
2.2 Major Components (Hardware/Software)

To support its functionalities, LivelyShelfs requires the following hardware and

software components. On the hardware side, a smartphone with a camera, internet connectivity, and sufficient storage is necessary. For the software, the application will be developed using a combination of mobile development frameworks such as Flutter or React Native, a backend server for data management, and machine learning algorithms for image recognition and recommendations. The software will be structured based on Figure 1, ensuring a modular and scalable architecture. Key components will include a user interface, a database, an image recognition module, and an algorithm for generating recommendations.

Figure 1

Major Functional Components Diagram



2 Identification of Case Study

LivelyShelfs is being developed for individuals and households looking to reduce food waste and make more informed decisions about their groceries. The case study group will consist of a small group of users who will use the app prototype and provide feedback. This feedback will be crucial for refining the app and ensuring it meets the needs of its users. In the future, LivelyShelfs could be adopted by a broader audience, including environmentally conscious consumers and organizations working to address food insecurity.

3 Glossary

Community Hub: A feature within the LivelyShelfs app that allows users to share food and resources with others in their community, fostering collaboration to reduce waste.

Environmental Sustainability: The responsible management of resources to meet current needs without compromising the ability of future generations to meet their needs.

Food Insecurity: A condition where individuals or households do not have reliable access to a sufficient quantity of affordable, nutritious food.

Informational Resources: Educational content provided within the LivelyShelfs app to help users keep groceries fresh, prevent spoilage, and make environmentally friendly decisions.

Machine Learning: A branch of artificial intelligence that involves the use of algorithms and statistical models to enable computers to improve their performance on a task through experience.

Major Functional Component Diagram (MFCD): A diagram that outlines the main components and structure of a software application, ensuring a modular and scalable architecture.

Prototype: An initial version of a product used to demonstrate its key features and functionalities, often used for testing and feedback purposes.

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