Lab 1 – LivelyShelfs

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Version 1

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1 Introduction

Do you ever think about how much food you have wasted over the years? You, along with your entire household, could be wasting hundreds of pounds of food every year. Food waste is a major societal problem that tends to go unnoticed.

Food waste is an ongoing global issue. There are many costs of food waste to our society, environment, and economy. It also heavily impacts the effects of food insecurity as well.

The United States loses approximately $161-$218 billion due to food waste. The average household in the United States loses about $1,500 for the same reason (Igini, 2024). This money that is wasted every year could be spent on other things that could help to benefit the families or the economy in other ways.

There are a lot of resources that go into making food; by wasting food we are indirectly wasting valuable resources. Agriculture accounts for 70% of water used worldwide (Lewis, 2024). Everytime food that needs water to be produced we are wasting the limited amount of fresh water that we have available to us. Food waste is also a contributing factor in harming the world's biodiversity; due to the increased demand for more food production, more land is needed to produce more food (Lewis, 2024). Food waste also contributes to harming the atmosphere, food waste is sent to landfills and these landfills contribute to greenhouse gas emissions. Landfills create around 8% of the world's greenhouse gas emissions; they are responsible for creating carbon dioxide and methane gases (The Environmental Impact of Food Waste). There were 2.3 billion people who faced insecurity in 2023, and approximately 713 to 757 million people were undernourished (Hunger Numbers Stubbornly High for Three Consecutive Years as Global Crises Deepen, 2024). A lot of food insecurity caused in the world is due to the

inequality of affordable food. If were are better able to utilize our food, some food that does not need to be wasted could be redirected to those who are facing food insecurity.

Our solution to the economic, environmental, and social effects of food waste is to develop an application to help busy individuals and households mitigate food waste that they could create by giving them the knowledge and tools to stop food waste from being created.
The LivelyShelfs application will provide users with a way of tracking the groceries that they have on hand and when they will expire. The application will also give users suggestions on what meals they can cook given the ingredients that they have on hand. It will also serve a hub

Our app hopes to bring benefit to the economic, financial, and community impacts of food waste. The app will help with people save money by allowing them to get all of their money's worth by not letting the food they purchased go to waste. It will help to support food stability through our community feature allowing those in the community to share food with each other. We will also raise awareness of food waste, by raising the customers awareness about the food that they will be wasting and how it will affect those around them and the environment.

2 LivelyShelfs Product Description

Our product, LivelyShelfs, will be an application that will allow our users to share food with their friends and manage food within their household through guest accounts. Our application will be able to give users resources to users to help educate them on methods to prevent food waste. The product will track the expiration statues of food that the user has.

2.1 Key Product Features and Capabilities

Key features that we want the application to have is Grocery Spoilage tracking, provide informational resources, food recommendations for the users. We want to help users keep track of when their groceries will spoil by using information that the uses have inputted into. The

application's inventory the application will track how fresh item is. We will use a web crawler to gather information online and the information found will be stored in our database to be used for our application. The information gathered will be available to the user to explore their options on how to better manage their food so that it does not get wasted. Our product will make recommendation to the users based off what groceries that the user has in their inventory and other factors such as expiration date and the type of grocery it is. We will base our recommendations based on statistics that we have gathered on the user themselves and the data that we have stored on other members of their community. From there we will recommend whether the user should consider sharing their food and what they can do to not waste their food. The application will also make recipe recommendations based on the items that the users have in their inventory.

2.2 Major Components (Hardware/Software)

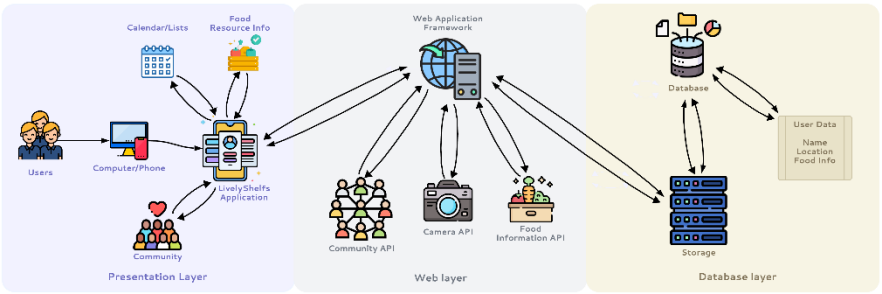

Figure 1: Major Functional Components Diagram

We will use a Three-tier Architecture for our program. The three main layers we will have are the presentation layer, the Web layer, and the database layer. Our presentation layer is where the users are able to interact with the application. The users will user this layer to look at their inventory and recommendations that are given to them by our programs. The Web Layer will be where all the different components of our product will interact with each other. The information that is inputted by the users in the presentation layer will be sent to the Web layer,

and the information will be sent to the appropriate API's to be analyzed and then sent back to the web layer to be sent to the database layer for storage. The web layer will also be where data from the database layer will be sent for our analysis API's to then send to the users on the presentation layer to keep them informed, so that they better understand their food use. The Database Layer is where all data will be stored and hold the information for our database schema. This layer will interact with web layer so the API's will have the appropriate data to make calculations on the data of the users.

3 Identification of Case Study

The application is made for the customers, the users, and the stakeholders that would like to manage food waste. The customers would be those who would do the cooking households so that they can keep track of the food that have so that they reduce the amount of food that gets wasted. The Users will be those that use our product, they are people who struggle to keep track of when their food will stay good so that they can ensure that they can save money on excess food. Lastly the group that final group our product is the stakeholders who are motivated to decrease food waste to help with protecting our environment from the negative effects of food waste.

4 Glossary

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.

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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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