

# Proposal

## Smart food storage

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Submitted in partial fulfillment  
Of the requirements of CSC-431  
Software Engineering course project

2/2/2022

## **Preface**

This is a proposal for the Smart Food Storage project for partial fulfillment of the requirements of a Software Engineering course (CSC431) project in the department of Computer Science at the University of Miami.

This proposal provides the scope and context of the project to be undertaken. It details the intended user group and the value that the system will have to them.

The intended audience of this document is the course professor and teaching assistants so that they can determine whether the project should be approved as proposed, approved with modifications, or not approved.

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## 1.0 Overview

### 1.1. Purpose, Scope and Objectives

Constantly physically checking and worrying about the food in the fridge and pantries is exhausting. The purpose of this project is to create an application for a smart storage system that monitors the items in your food storage which can help make home cooking and dining experience smoother and more efficient. The intended audience are anyone with a kitchen space at home, especially college students starting to cook for themselves and suburban parents with kids aged 0-21.

At the time of its release, it would require an internet connection and smart device(iOS, MacOS, Windows or Android). The application would be created with Apache Cordova, a free and open-source platform, which allows for cross-platform mobile application creation using HTML5, CSS3 and JavaScript. Apache Cordova includes a number of useful frameworks and tools which allow the creator to wrap a “web-application” into a mobile application.

### 1.2. Project description

The Smart Food Storage app will first prompt the user to input what they have in stock in their refrigerator, and the quantity of food. There will be a graphic visual of items currently in the user’s “refrigerator,” and a separate pantry that displays other items like fruits, dry ingredients, and snacks, typically not found in a fridge. The visual can either be viewed from the *refrigerator view*, which will display a refrigerator/pantry and the inputted items, or *grocery list view*, which simply lists all items in text format. From that information, the app will generate recipes that the user can create.

There will also be modules to decrease the quantity of food when it is used. For example, if originally the user had two apples in his refrigerator, after selecting a recipe that requires one apple, the amount of apples automatically decreases to one. If the user has used up an apple in another way/obtained more apples, then they can manually input a decrease/increase in the amount of apples.

The generation of recipes will be programmed by our team, but will access external online sources for recipes. The app detects the recipes by matching the food items in the user’s storage with the ingredient list on the online recipes. First, the user can view their items and then click ‘Let’s Eat!’ to generate recipes. The recipes will be displayed in the app’s GUI and will all follow a similar look and feel to bring cohesion from the many recipe sources. The *Smart Food Storage* app will mostly rely on recipes from popular and highly-rated recipe sites, such as *Food Network*, to get the best recipes available. However, if there are no recipes available that can be procured from the recipe sites, first, the recipe algorithm will look for recipes that can be almost fulfilled by the user’s food items in storage and recommend common substitution ingredients (currently

available in storage). Secondly, if the user does not find this satisfactory and wants more options, the app will generate recipes from a generic Google Search (that may not procure the best recipes available). There will be an icon that shows where a recipe comes from and also a button to refresh recipes and find different ones. The app will also have its own separate ratings system that the *Smart Food Storage* users can rate and see other users ratings. We opted to have our own rating system as ratings online can be misleading, and to cater individually towards *Smart Food Storage* users and show them ratings that are most applicable to them. The buttons and modules on the app will also be programmed by our team.

In the long-term, we are hoping to add additional features that replace the need for manual input by the user. Instead, users can buy a *Smart Fridge* that will detect food items and how much of each food is in the fridge currently. This can be achieved through AI technology that utilizes built-in scales in the fridge and a camera to track objects. Further development is needed to devise this new technology. There will also be another physical component that can be placed in the pantry or fruit bowl that detects other food items.

#### Software:

- *Refrigerator/Pantry* display
- *Grocery List* view
- 'Let's Eat' popup button
- Popup of 3-4 recipes with the option to refresh and generate a different set of recipes
- Detection of missing ingredients of a recipe with substitution ingredient suggestions
- Ratings system for *Smart Food Storage* users

#### Hardware:

- Smart Refrigerator with AI technology that utilizes weights and camera controls
- *Smart Storage* additional component that can be attached to the pantry and other areas where food is stored