Virtual Pantry

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Abstract
Team 4's project is an Android application that acts as a virtual pantry and recipe finder. It will keep track of the food ingredients that a user has by allowing them to input items that will be stored by the app. It will also be able to search the web for recipes that use the ingredients a user has available to them. They will also have the option to export ingredients to an online shopping cart at a local grocery store. The primary goal of the app is to focus on usability by providing intuitive features such as allowing users to add items to their pantry by simply tapping on common ingredients and allowing users to filter a recipe search with fields such as cuisine type.

Project Description
The main goal of Team 4's project is to provide an Android application that stores a list of ingredients and presents recipes based on cuisine preference and current ingredients. Team 4 aims to add novel features and improve on issues that are found in similar applications. The application will act as a virtual pantry by allowing the selection of ingredients that users currently have or plan on purchasing to be put into their virtual pantry. After compiling their ingredients, the app will give the user an option to bring up a general list of recipes or recipes specific to the cuisine based on the ingredients in their virtual pantry.

Team 4 is trying to build a convenient and simple way to let the general public explore the world of cooking by accessing relevant recipes that use ingredients on hand. The app allows users to access many different recipes in a convenient way, enabling them to cook new dishes they never knew they could make. The app will also improve upon the user experience of similar existing apps by implementing novel features.

The significance of Team 4's virtual pantry project is that anyone with or without cooking experience will be able to use this application to broaden their knowledge of cooking and explore new types of food by providing access to a variety of recipes based on the ingredients in their virtual pantry. Due to similar existing apps being marred with negative reviews, Team 4 believes this idea can be improved on.

This application has several requirements and characteristics which Team 4 believes are necessary to create a high-quality application. Functionally, the application must have an intuitive UI/UX, an ingredient input method that is convenient to use, a way to store the ingredients input to be used at a later time, and an accurate and quick search function for relevant recipes to the selected ingredients and/or cuisine.

The intended audience of Team 4's project is any user who would like to make a meal they have not cooked before or who simply wants to learn how to cook but does not have the knowledge or vision to combine ingredients available to make meals. This audience may range from college students living alone and away from home looking for the best tasting meal with the little ingredients they have. Another audience could be parents and family cooks looking for a more diverse selection of dishes to make and share with the rest of their family.

The key usability goals of the virtual pantry app are for the user to have a simple way of keeping all their ingredients in one place to make it as easy as possible to search for recipes they are able to make. With all their ingredients cataloged, it is easy to identify which ingredients are going bad and prioritize recipes that minimize waste. The user will also benefit from knowing which ingredients they will need to buy if they select a recipe which contains missing ingredients. This helps the user plan for more efficient grocery shopping for desired meals.

A future enhancement to the Android app beyond CS 425 would be implementing an integrated computer vision system that identifies ingredients in a phone picture, allowing the user to simply take pictures of their groceries to store them in the app instead of manually entering their ingredients.

A potential challenge that Team 4 may encounter during the project's development is their lack of experience in Android development. Not all of Team 4 has experience in developing in the Java programming language which could be a potential challenge on top of Android development. The UI design of this application can pose a potential challenge as the application will be trying to display the recipe's information on a phone screen. Team 4 will need to handle how to properly present the information of the recipe in a readable format on a phone screen for an end user. Team 4 also has conflicting schedules, so finding time where all members can meet will be another obstacle to overcome.

Team 4's project intends on developing their application with Java for the Android platform using Android Studio. Team 4 plans on utilizing free APIs found online that handle the searching of recipes.

Below is a brief overview of each of Team 4's members' background, skills, and expected involvement in the project:

Ben Penwell is currently a Slot Game Design intern at Circle 8 Games. Ben has limited experience with Android Studio creating a utility-based application for KC employees. Ben's relevant skills include improving UX/UI designs, professional design documentation, and app development. Ben expects to contribute intuitive design ideas to improve upon the biggest flaws found in existing competitors' apps.

Chris Koh has preliminary knowledge of machine learning usage and mobile app development because he has built an app that uses facial recognition, Microsoft Azure's cognitive services, and a website's API. He intends to apply this knowledge and its relevance to the project along with contributing additional feature ideas to ensure a successful project.

Brian Ly is currently a Software Engineer intern at Hamilton company. Brian has experience in writing professional code in C#, working with different APIs, and making software for the purpose of automation with medical equipment. Brian expects to contribute his knowledge of working with APIs that is needed for the project, provide programming practices learned from his internship, and professional documentation practices that will help with the development of the application.

Zach Sonner is currently a Software Engineer intern at Bombora. Zach has experience in writing professional code in C# and Java, professional documentation experience and database experience in Bigquery, AWS and Mongo. Zach expects to contribute his familiarity with agile methodology, Java experience, and professional coding standards learned under senior software developers at his internship.

Dr. Emily Hand has agreed to be the external advisor for Team 4's project.

Team 4 expects this project to help us develop new marketable skills. Choosing to develop in Android is a good choice due to the lack of experience that a majority of team members have with the platform and Java programming. As such, this project enables Team 4 to gain experience developing a mobile application in Android Studio with a focus on Java and XML utilization. The project also provides the team experience in completing a large-scale project from start to finish in a group environment. All of these experiences will help each team member's professional growth by providing new skills that will allow them to qualify for more competitive jobs upon graduating.

Market Potential

The recipe finder market is quite healthy with many options; however, only a handful allow users to find recipes based off the ingredients they currently have. Additionally, many of the existing applications have poor reviews and appear to be quick ports from their website counterparts with little utility added when converted to a mobile application. This gives Team 4's app large market potential by improving on the flaws of other similar applications.

The existence of the vast amount of recipe websites shows that there is an audience that uses these websites to cook their favorite dishes. The ability to compile all relevant recipes that use ingredients available on hand will help users avoid the recipes that they are not able to make.

A similar product Team 4 found was Supercook, which takes ingredients as input and finds recipes that are able to be made with them. This app would be in direct competition with our app as it holds similar key design points, but it is lacking in several categories such as ingredient saving and lack of filter options. Another similar class of products includes recipe websites that people browse for 'recipes of the day'. These sites would be in indirect competition with our app as the user would eventually be redirected to some of these sites for the actual recipes.

The novelty of Team 4's project lies in its intuitive ingredient input system and ability to provide the user with recipes found on the internet compiled into one list based on the user's ingredients and preference of cuisine. Another novel feature that Team 4's project could have is an export function that submits the requested recipe ingredients into an online shopping cart at a local grocery store of the user's choice.

Team 4's project stores a persistent list of ingredients and has the ability to search for relevant recipes all in one application, giving the user the ability to filter recipes based on fields such as cuisine preference. Team 4's implementation will integrate novelty features and be more user-friendly. This will enable Team 4's project to be more competitive against existing apps.

Time Worked on Project Concept

Ben Penwell - Outlined of the following sections for the team to elaborate on: Project Description (main goals, main functionality and characteristics, intended audience, key usability goals, product enhancements, challenges and obstacles, technology description, team overview (Ben), professional growth) and Market Potential(market analysis, competitive advantage). Read and revised the document throughout this process. Total time spent working on the project concept is 3 hours.

Brian Ly - Started the actual writing, helped outline the sections in the project concept report, and helped with revision and editing. Sections that were worked on: Abstract, Project Description (main goals and objects, intended audience, key usability goals, potential for further development/product enhancements, challenges and obstacles, technology description, team overview (Brian), advisory overview), Market Potential (professional growth and competitive advantage). Total time spent working on project concept is 4 hours.

Zach Sonner - Helped outline the sections in the project concept report. Edited and rewrote sections to help flow and feel less stiff. Sections worked on: Abstract, main goals and objectives, intended audience, key usability goals, potential for future developments, challenges and obstacles, team overview (Zach), advisory overview, market analysis, and competitive analysis. Research on competing apps and sites. Total time worked on project concept is 3 hours.

Chris Koh - Rewrote abstract to make it more general and performed revisions on main goals and objectives, intended audience, key usability goals, potential for future developments, challenges and obstacles, team overview (Chris), advisory overview, market analysis, and competitive analysis. Total time spent working on the project concept is 2 hours.