

Stony Brook University

EST441 FINAL PROJECT: KITCHEN ORGANIZER APP (COOKBOOK)

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## **Abstract**

Many people who need to cook or have an interest in cooking find it difficult to plan what to make while juggling costs, food waste, and finding appealing dishes to create all at once. This report will be on a design project of a kitchen organizer application, dubbed “Cookbook”, intended for users who want to cook more efficiently and effectively at home. The main goals of this app are to allow users to maximize use of their ingredients, keep track of what is in stock, compose and sort custom recipes, generate automated recipe plans by day(s)/week, and search for other recipes by other users. The ingredient use maximization and food waste minimization will be accomplished by having the user self-input new and existing ingredients manually or through a camera with recognition capabilities, and the recipe plan generator will draw upon preferences set by the user and what ingredients are available to create plans for day(s) or a week. It will also be able to expand these preferences if allowed, such as suggesting recipes that require related ingredients that are accessible but not already logged. Though the user can fully manually write and input custom recipes, the app should be able to take URL input and auto-generate one accordingly if a recipe is recognized. The user may also choose to publish recipes stored on their account for the online community to access, and results will be able to be filtered by various criteria, such as time required, cuisine, etc. Cookbook will be available to access through a browser on a computer, and on an application through smartphones. Overall, the goal of the program is to promote smart food usage, and cultivate an online community with quality recipes to share for everyone.

## Technical Functionality

The business plan for the app is built upon addressing the designated main problems, namely: food prep planning, waste management, and recipe quality. These are tasks that people struggle with or find some level of difficulty with, and I have determined that the most appropriate target audience with these main problems are college students, people ages 16 years old or older, and anyone with an interest in cooking at any level. This is because as a college student myself, I have often found it difficult to plan/cook meals while juggling those three main problems and properly solving them on a daily basis. Keeping in mind these customer segments, I conducted a competitor analysis on other well-known apps with similar purposes, and found the following results:

Name	Notes
Paprika Recipe Manager	<ul style="list-style-type: none"><li>- Provides recipes of all levels</li><li>- Provides organization tools for different types of recipes</li><li>- Shopping list function</li></ul>
BigOven	<ul style="list-style-type: none"><li>- Suggests top recipes for user reference</li><li>- Recipe scanner for ease of input</li><li>- leftover usage planner</li></ul>
Yummly	<ul style="list-style-type: none"><li>- sports an app and desktop layout</li><li>- learns from searched/saved recipes in the user's account data</li></ul>

While Paprika Recipe Manager has the benefit of being organized and providing recipes for beginners as well as expert cooks, it does not have a modern interface and can feel less appealing to use. BigOven has a more updated layout and is thorough in the detailing of recipe

requirements and components, but is not as smooth and it can be overwhelming to sift through the information and options. Finally, while Yummly has the most modernized style of the three and allows the user to access their account and its functions from both phones and computers, its main problem is the lack of quality recipes. This is in reference to comparatively cultural dishes, not generalized ones that require more common ingredients and are easier to make.

My takeaway from this analysis is that the primary components to integrate into the app concept are: recipe scanning, a self-learning search function, multi-platform access, display of trending recipes, inventory management, and a smooth, modernized user interface. From these research findings, I composed a Business Model Canvas (BMC) to clarify the design thought process and outline the parts to prioritize in development.

<p><b>Key Partners</b></p> <ul style="list-style-type: none"> <li>- renowned chefs (to bolster app reputation and marketing)</li> <li>- cultural organizations (to ensure recipes are approved by authentic experts)</li> </ul>	<p><b>Key Activities</b></p> <ul style="list-style-type: none"> <li>- organizing recipes and inventory</li> <li>- suggesting new recipes to users (based on preferences and history)</li> <li>- generate food plans (based on inventory and other customized settings)</li> </ul>
<p><b>Key Resources</b></p> <ul style="list-style-type: none"> <li>- office to develop and maintain app platform</li> </ul>	<p><b>Value Propositions</b></p> <ul style="list-style-type: none"> <li>- helping users maximize use of ingredients</li> <li>- helping find quality recipes</li> <li>- keep track of inventory</li> <li>- minimize waste</li> </ul>
<p><b>Customer Relationships</b></p> <ul style="list-style-type: none"> <li>- get users from ads and word of mouth</li> <li>- keep by integrating into daily use and storing personal recipes (sentimental value)</li> <li>- grow by referrals</li> </ul>	<p><b>Customer Segments</b></p> <ul style="list-style-type: none"> <li>- college students</li> <li>- ages 16+</li> <li>- anyone with an interest in cooking at any level</li> </ul>

<p><b>Channels</b></p> <ul style="list-style-type: none"> <li>- promotions with other websites</li> <li>- community on application platform</li> <li>- social media platforms</li> </ul>	<p><b>Cost Structure</b></p> <ul style="list-style-type: none"> <li>- development costs (discussed further in Finances and Costs section)</li> <li>- platform maintenance</li> </ul>
<p><b>Revenue Streams</b></p> <ul style="list-style-type: none"> <li>- simple app subscription service for more features</li> </ul>	

From this BMC, I determined that there are five main pages that should be implemented into the app: a homepage, a search page with filtering capabilities, a page for custom additions, a page to access saved recipes, and an account details page. To enable the self-learning search and trending content display functionalities, the app will be designed with machine learning capabilities.

Machine learning (ML) algorithms typically allow developers to use existing data to predict the outcome of a designated case (or in some cases images and other forms of data), and the Cookbook app would be designed to use natural language processing (NLP) programs to perform sentiment analysis. This would occur both on a micro level per user to predict what recipes they would like to see on their feed, as well as on a macro level to see what recipes are trending among the main population of users and then display it while factoring in user preferences.

Existing programs such as OpenAI already are capable of generating whole bodies of text from a small custom prompt, though this is done by utilizing large datasets of text. The Cookbook app would need some time to accumulate live data from users and some collected from study groups to analyze before a truly accurate trending function can be shown.

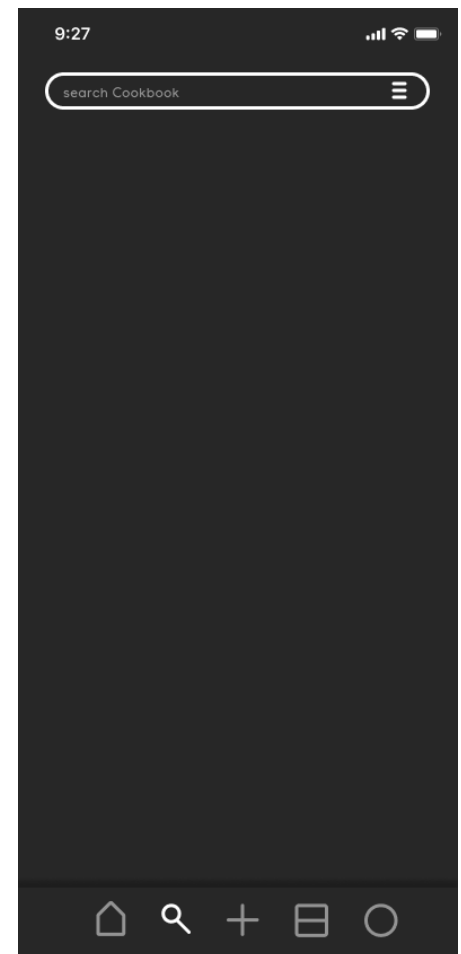
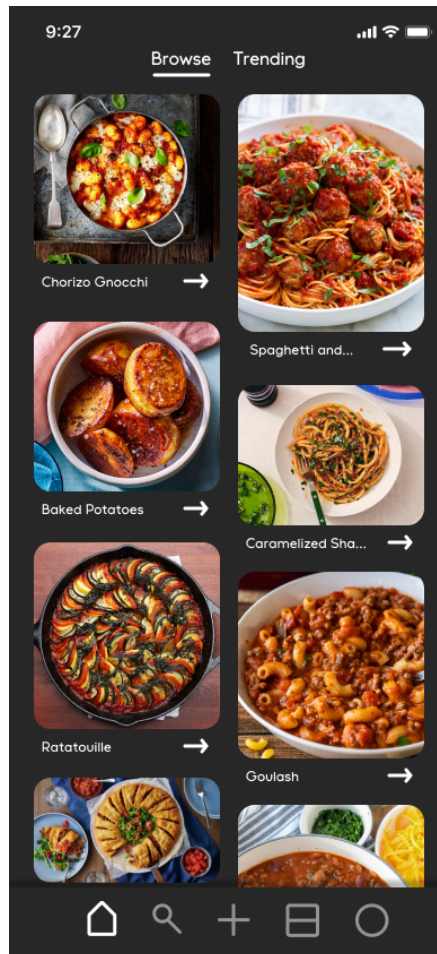
## User Interface & User Experience

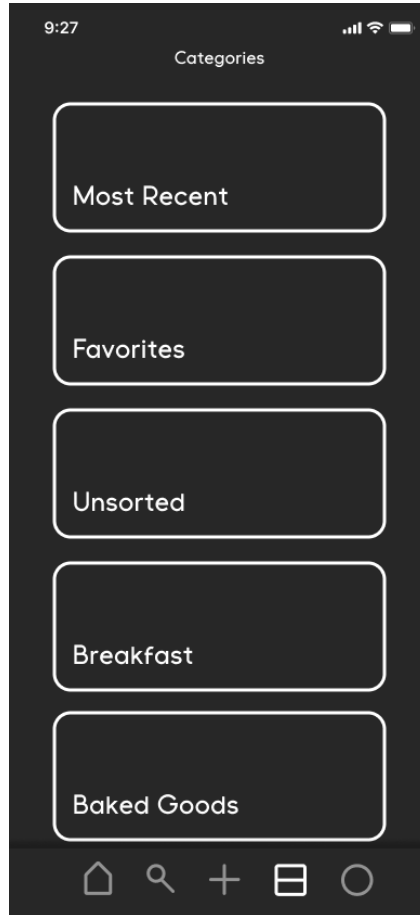
User interfaces (UIs) are heavily involved in the functionality of the application. This includes but is not limited to: aesthetics, communication of features, and branding of the service(s). In order for the app to be successful, research has been conducted on competitors and other apps to collect evidence on what specific layouts, graphics, etc. are most effective in similar applications and websites, and are presented below as well as a mockup prototype design of the application at a smartphone size, designed in Figma.



Fig. 1 - Simple logo design for app

(going left to right: Fig. 2 - login page, Fig. 3 - homepage with user feed, Fig. 4 - search page)





(going left to right, top to bottom: Fig. 5 - user page for custom additions, Fig. 6 - user page to access saved recipes, Fig. 7 - user account details page, Fig. 8 - new recipe addition page)

In Figure 3, I designed a simple user feed page to show recipes the user may potentially be interested in, which can be viewed by tapping their images. The user can also swipe left to access the trending recipes page, which may not display recipes quite based on user preferences/data but are more widely viewed by the general user base. At the bottom, there is a simple navigation bar with home, search, addition, saved, and account icons to navigate to their respective pages. To indicate which page is currently open, the appropriate icon is in brighter white color, while the others are grayed out to be less visible. In Figure 4, the search page is relatively simple, with a search bar sitting at the top with a filter button on the side to indicate to the user that more specification options are available. Figure 5 depicts the new custom additions page, to support the app's value propositions. Here, the user may choose to write a new recipe, log more ingredients, or set a new food prep plan by tapping on the buttons. Once the user taps into the "New Recipe" button, it will open the page depicted in Figure 8, where they can set the name, ingredients, difficulty, cuisine, and type for the dish they are writing for. In Figure 6, the user's saved recipe page is shown, where they can view all the categories of recipes they have set as well as the recipes within by tapping, and can add new custom categories by scrolling to the bottom. Finally, in Figure 7, the user details page is displayed where they can change account settings as well as view and/or change their current inventory of ingredients that Cookbook references to build their food prep plans.

## **Finances & Costs**

This section will review possible costs involved in the prototyping, engineering, and development of the application on smartphone and computer platforms. It will also outline the basic financial starting plan for the app's initial stages, including fixed rates and estimations.



After conducting research on other apps, the best course of action for launching the app would be to start with a \$0 initial user cost, meaning the users can download the app first for free. This is to get as many people to notice and download the app as possible, as having any upfront cost to pay is a significant deterrent for new users who do not quite know how much value they will get out of the app yet. After they have downloaded the app, Cookbook will have an option for them to purchase more features such as the ability to promote their recipes to other users, increased meal planning capabilities, etc. under one package deal of \$4.99. Based on research for previous successful app launches, the estimated cost for the Cookbook app's development will roughly be \$300,000. This is due to its level of complexity, as it involved multiple functions such as a scanning feature, storing and interpreting information through machine learning, and a full dedicated team of software developers to build and maintain the application. According to other similarly sophisticated app development timelines, this program will require at least 9 months to determine the necessary components, write the code for those parts, and release the finished minimum viable product. Assuming the app's revenue is roughly \$3,500/day through passive income and excluding any in-app purchase income, it will take only 85 days for the project to break even with the initial \$300,000 development cost.

## **Conclusion**

Through competitor analyses, I determined what similar existing apps are successful in as well as lack to gain a better understanding of what the Cookbook app's development would require. Breaking down the design process using the Business Model Canvas also helped identify the most important parts to include in the final version of the program. By researching what other sites and applications use for their predictive functions, it was possible to determine that machine

learning, specifically NLP, programming is necessary to enable those features. Proper user interface design and user experience analyses also lend much more value to the app, and enable a solid financial plan based on the identified complexity of its parts. I believe that with more research to validate the previous findings and thorough implementation in the programming and user interface design, the Cookbook app can be fully developed and launched as a usable application on the market.