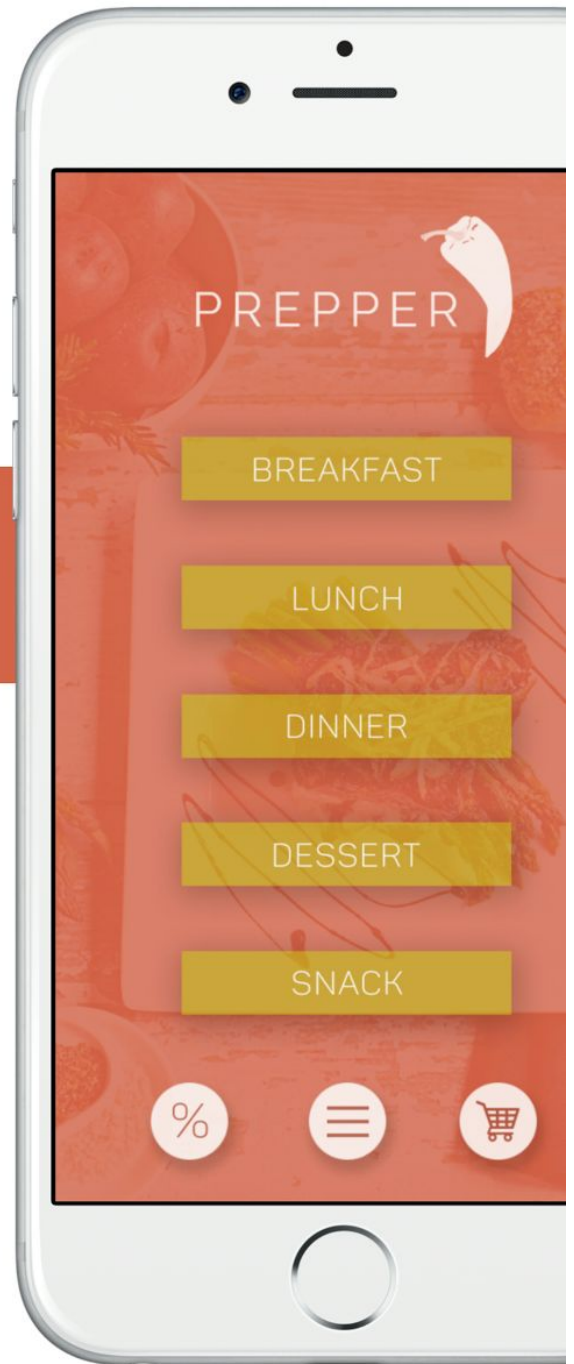


# PREPPER

## Final Report

SASE InnoService  
Carnegie Mellon University  
June 8, 2015



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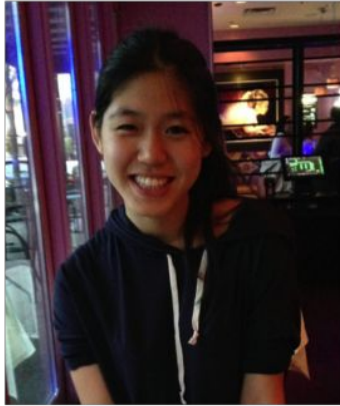
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## Team Information



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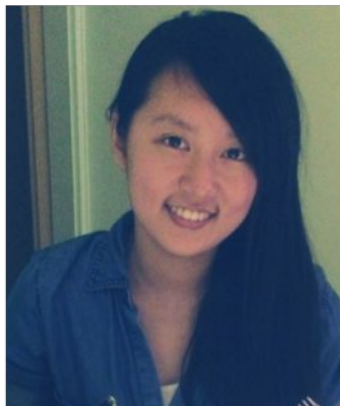
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# Executive Summary

Prepper is a personalized recipe mobile application, designed to make cooking at home easier. Its purpose is to save the user time and money and promote healthy eating. This is accomplished through its Recipe, Inventory, and Grocery List functions. The digital inventory can be updated by scanning grocery receipts and item barcodes, or by manual entry. A unique feature of Prepper is the notification of item expiration dates to reduce food waste. Recipes are automatically generated according to the items currently in the user's inventory. These recipes can be filtered by categories such as calorie content, cook time, and ingredient expiration date. When an item is used up, it is automatically sent to a manageable To-Buy list to ease the burden of grocery shopping.

The target consumers for Prepper are young professionals because of their technological know-how and transitioning lifestyle. To defy competition for this audience, Prepper differentiates itself as a practical, convenient, and aesthetically-pleasing app. The app will be distributed on the Apple and Google Play stores at no cost to the consumer. Instead, revenue will be gained through partnerships with supermarkets. Long term plans for Prepper include expanding from Pittsburgh, PA, to nationwide.

# Project Background

## Conceptualization

An initial rudimentary idea of our product was a result of a reflection on one of the most expensive everyday costs: food. Focusing on the entire process of cooking, from store to stove, we delved deeper into the problems consumers typically encounter.

- **Expired food.** A common problem is the unmindfulness of expiration dates, leading to wasted food and money.
- **Buying groceries.** Forgetting to buy items or buying an item you already have can be a common occurrence without a meticulously recorded grocery list.
- **Meal planning.** Deciding what to make can be a time-consuming process. Planning meals is especially difficult without knowing all the items in your inventory.

## Identifying Market Need

A market survey was distributed to determine if consumers shared the aforementioned difficulties and to evaluate if there was a need for a new product. The responses we received were quite positive, with a high majority of the participant demographic being a student or employed, ranging from ages 21 to 40.

93% of respondents reported that they often found expired food in their fridge or pantry. Furthermore, in an interview with Emily M. Broad Leib, the director of Harvard Law School Food Law and Policy Clinic, an average household of four may throw away between \$1,365 to \$2,275 worth of expired food per year<sup>4</sup>.

98% of participants affirmed that it would be helpful to know what foods are in your inventory and which are running low when buying groceries.

In terms of cooking, 87% of people wished they had more time to cook. Additionally, 93% of respondents said they sometimes do not know what to make for their next meal and 70% reported they would be more inclined to cook if they had dietary-need specific recipes.

Further research illustrates a need for healthy eating. According to the USDA Economic Research Service, spending on outside eating has increased more than 17% since 1970<sup>7</sup>. Associating with this upward trend is a positive correlation of overeating and obesity. A return to

home cooking is necessary as it allows for greater control of meal nutrition and generally involves lower consumption of fat, calories, and cholesterol.

Consequently, we developed Prepper, a mobile application that records your food inventory, assists your grocery shopping, and most importantly, supplies you with recipes in accordance with your current ingredients.

## Product Benefit

Prepper aims to serve its customers in the three following ways:

- ➔ **Save time.** By helping the user decide what to cook and what to buy at the supermarket, Prepper can effectively save him or her time.
- ➔ **Save money.** Through the unique feature of expiration date notification, the consumer is less likely to waste food. This function, along with a coupons and sales list from partnered grocery stores, will save the user money.
- ➔ **Be healthy.** The user can filter the recipes based on the amount of calories which, in addition to cooking more in general, will promote a healthier lifestyle.

## Customer Analysis

By developing a demographic and behavioral profile for our potential users, we concluded that Prepper is well-suited in today's burgeoning technological age and will appeal to the digitally connected consumer.

### Demographic Profile

The following demographic data was gathered from our market survey.

- **Ages 21-40.** Because our interested respondents were averaging in the 21-40 age range, they are likely very familiar with smartphone and tablet technology. According to Nielsen Holdings N.V., an average of 83.7% of Americans in this age range use smartphones.<sup>8</sup>
- **Employed or students.** Employed persons and students are a large consumer of digital products that streamline their lives, such as scheduling, homework, and cooking apps.

### Behavioral Profile

- **User ratings.** Consumer ratings and "likes" are a current trend in social media. The "like" feature will be utilized on Prepper's recipe page to reflect this behavior.
- **Personalization.** A clear market preference is the ability of personalization and customization. This is illustrated in digital products such as Facebook and Spotify, and now Prepper.

## Current Existing Technologies

A comparison of Prepper with the most similar apps on the market demonstrates our product's uniqueness.

	Prepper	Yummly	Handpick	Fridge Pal
Polished, easy-to-use interface.	✓	✓	✓	
Digital inventory of kitchen at your fingertips.	✓			✓
Ability to scan receipts to easily add groceries to your digital inventory.	✓			
Accurate scanning function.	✓			
Estimates expiration dates and flags expiring ingredients.	✓			✓
See flagged recipes that contain expiring ingredients.	✓			
Automatically view personalized recipes that can be made with what you have on hand.	✓			
1 million+ recipes from a variety of popular food blogs and recipes sites around the web.	✓	✓	✓	
Filter recipes based on cook time, rating, cuisine, or dietary restrictions.	✓	✓		
Make a grocery list.	✓			✓
See coupons and sales from local supermarkets.	✓			
No advertisements.	✓		✓	
Focused on making cooking easy.	✓			

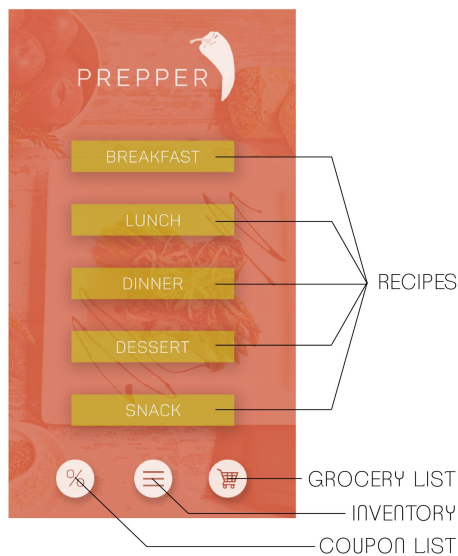


## Resources and Timeline





# Prototype



The mobile application, Prepper, consists of four main functions: recipes, inventory, grocery list, and coupon list. In short, Recipes displays possible dishes the user could make with the items in his or her inventory. Inventory keeps track of the user's grocery items. Grocery List acts as a to-buy list for when the user goes grocery shopping. Finally, Coupon List is a list of deals and discounts offered at our partnering grocery store.

## Recipes

### What does it do?

Prepper's main feature is the ability to automatically generate recipes from websites, food networks, blogs, or social media, based on the ingredients listed on the user's inventory.

Recipes are shown on the start screen when app is opened, users can select the desired meal type there. A filter would also show up on the list of recipes, where users can choose the ingredients, cooking time, ratings, dietary restrictions, etc. Most effectively, recipes containing the user's expiring ingredients would first show up on the search results.

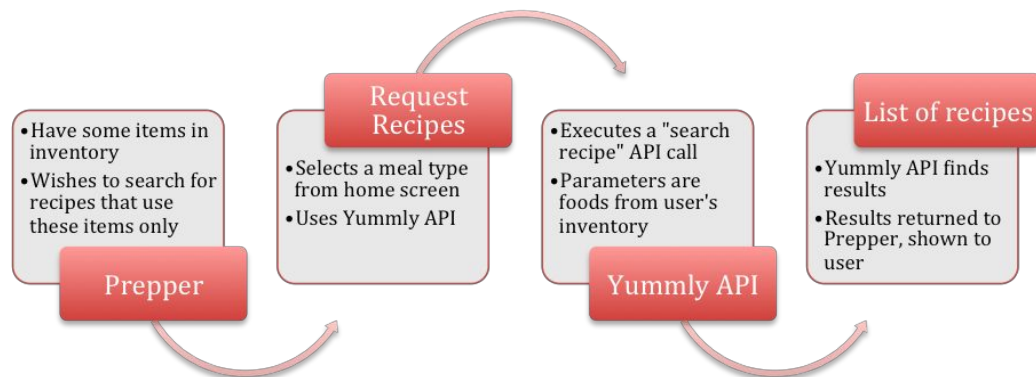
### How does it work?

To search for recipes online that only incorporates ingredients the user already has in the inventory, we would utilize the Yummly API (Application Programming Interface).<sup>11</sup> Yummly is the world's largest and most powerful recipe search site, and it provides its services to other website and mobile applications; we would simply use it as our recipe search engine in Prepper.

When the user searches for recipes, Prepper uses Yummly's "Search Recipe" API function, with parameters being ingredients that already exist in his or her inventory. This



“Search Recipe” API call would then return a list of recipes that requires only ingredients that the user has, and Prepper would show this list to the user.



## Inventory

### What does it do?

Inventory keeps track of the user's grocery items. To input foods into an inventory, simply scan a grocery store receipt with the phone's camera, scan the barcode of the product, or manually type it in. This information can then be stored on an inventory list. Moreover, Prepper can estimate expiration dates of foods, thus informing users of the expiration dates. For each item, the user can swipe left to adjust its quantities or delete it when it runs out. A trash button on the main screen leads to a list containing recently deleted items where the user can restore them.

### How does it work?

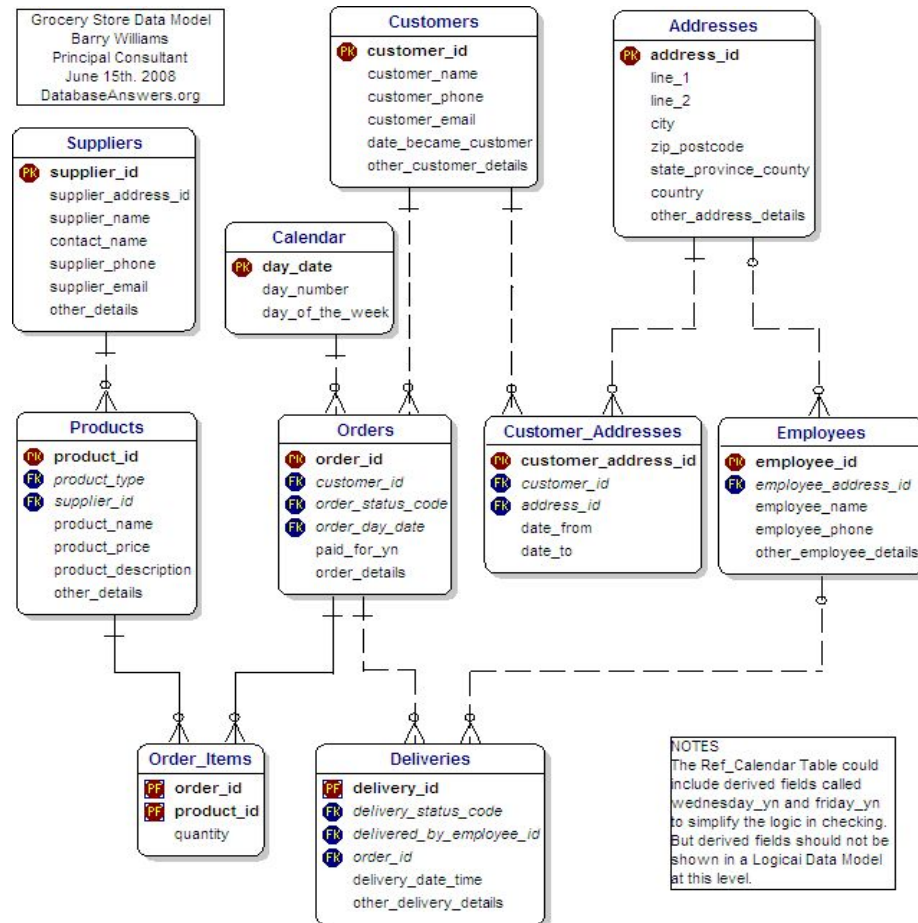
#### Inputting new items

##### Scanning barcodes of receipts

The barcodes printed at the bottom of receipts are for internal use by the stores, and identifies a particular transaction. When we partner up with a grocery store, we will gain access to their database. A sample grocery store data model from databaseanswers.org is provided below.<sup>10</sup> This means that when a user takes a picture of the barcode in Prepper, we are able to look up the exact items on the receipt because this data can be extracted from grocery store's database by the barcode. We then list these items in the inventory screen.

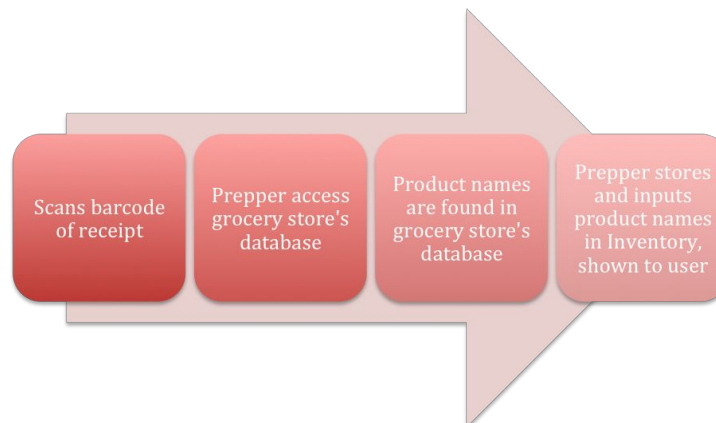
The screenshot shows the 'INVENTORY' screen of the Prepper app. It features a yellow header with a back arrow, a plus icon, a list icon, and a trash icon. Below the header is a list of grocery items with their quantities:

Box of lasagna noodles	1
Italian seasoning	1
Italian sausage	2 lb
Packages cream cheese	8 oz
Cucumbers	5
Apples	7
Zucchini	8



**Grocery Store Data Model**

Precisely, the barcode contains numerous “product\_id”s of all products on receipt. We can then iterate through each “product\_id” from the barcode and find the “product\_name” in the grocery store’s database. In more technical terms, we are joining the foreign key “product\_id” in the module “order\_items”, with the primary key “product\_id” in the module “products”, then acquiring the respective “product\_names”, which will be listed on the inventory.



### Scanning barcodes/QR codes of individual items

We would integrate into Prepper the Embedded SDK barcode scanning tool provided by ScanLife, a company that provides software that retrieves information from QR codes. The Embedded SDK barcode scanning tool would integrate a scanning function in Prepper that directly interfaces with ScanLife, which is able to return the product name of the item being scanned.

### **Estimating expiration dates**

This is the only part in our implementation of the app where we have to create our own database. In order to estimate an item's expiration date, we would write a data model, in which we sort foods into different categories. We would use a hash table, where each element in the hash list table is a category and each list from the hash table contains foods from that category and their expiration dates. Expiration dates would be taken from Eatbydate.com, a reliable site that provides expiration dates on just about all foods. We can then access an item's expiration date with a lookup function with the key being the item's name, and the hash value being its category, as retrieved from the grocery store's database, "product\_type" under "products" module. If the item is entered manually, i.e. through scanning its barcode, then a prompt would appear to ask for user's input on its expiration date.

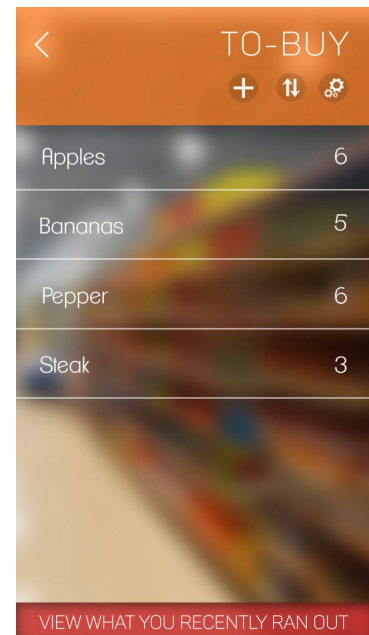
## **Grocery List**

### **What does it do?**

The grocery list is a shopping helper for the user when he goes grocery shopping. When items are deleted from the inventory, they automatically show up on the grocery list. The user can manually delete or add other items to the list. A little percent icon appears next to the items on the grocery list to indicate whenever there are deals and discounts at the grocery store. See "Coupon List" below for more details about deals and discounts.

### **How does it work?**

When an item's quantity in Inventory becomes 0, data will be sent to Grocery List that suggests the user to add the now ran-out item to the Grocery List.



# Coupon List

## What does it do?

Coupon list is a list of deals and discounts offered by our partnering grocery stores. To view a complete list of deals, the user can access a coupon list from the main page.

## How does it work?

Grocery stores have a weekly sale list of foods on sale. We would extract this information from the grocery store's website or database, whichever is available, store it in our own server, and upload it to Prepper weekly. We would implement this list of sale items with the hash table as our data model. Information such as price, and product name would be stored alongside the product's ID, all acquired through the grocery store's database. These product names and sale prices would then be demonstrated on our app. And, if any item from the inventory matches up with one from the coupons list, an icon indicating "on sale" would be shown next to item.

DISCOUNTS	
Boneless Chicken Breasts	BUY 1 GET 1 FREE
Unilever Ice Cream Brands	4 for \$10.00
Fresh Atlantic Salmon	\$5.99 lb.
8" Apple or Cherry Pie	\$2.99 ea.
Mountain Dew 24 pack	2 for \$12.00
Cheetos	



## Meeting Consumer Needs

Prepper revolutionizes our way of cooking. Through keeping track of the user's grocery items, generating inventory-based recipes, and automatically suggesting grocery list items, Prepper meets the consumer needs of saving money, saving time, and being healthy.

- **Save money.** Prepper saves the consumer money by raising awareness of expiration dates and local deals and discounts.
  - ◆ **Expiration dates:** Using the expiration dates of common foods, gathered from Eatbydate.com, and incorporating them into our inventory list and recipe generator, we can effectively limit the amount of expired, unused food that is thrown away. The inventory list will remind the user what item is expiring, and the recipe generator will incorporate that item into a dish that can be made. This results in saving the user money.
  - ◆ **Coupons:** The list of deals and discounts from the user's grocery store will save him or her money on food as well.
- **Save time.** Prepper helps the user save time with the convenience of its automatic recipe generator and grocery list.
  - ◆ **Recipe:** With the recipe generator, deciding what to cook is made quick and easy. The conventional way involves going back-and-forth between searching for recipes and searching for proper ingredients, until the a possible dish can be made. But with Prepper, this time-consuming process is eliminated, as the available recipes are already tailored to the items in the user's kitchen.
  - ◆ **Grocery list:** Consumed items will automatically be placed on a To-Buy list. The convenience of this aspect will save the user the time and effort it takes the user to remember and write down the items that need to be bought.
- **Be Healthy.** Prepper encourages a healthy lifestyle by promoting cooking with the convenience of the recipe feature. Generally, people who cook meals regularly consume less calories, fat, and sugar than those who eat out or eat prepackaged food. This benefit is compounded by the ability of filtering recipes according to the user's nutritional needs.



## Delivering the Prototype

In order to develop a functioning prototype of Prepper, we need to utilize the Yummly API, the ScanLife API, as well as use developer programs such as Xcode IDE for iOS and Eclipse IDE for Android.

- **Yummly API.** Yummly provides its services to other mobile and website applications with a cost of \$500/month, with a cap on 250k API calls/month. We would subscribe to this plan to begin with, and since we would start from the Pittsburgh region, 250k API calls are ample for a small starting population.
- **ScanLife Scanner SDK.** ScanLife provides its services for free up to 1 million users. As previously mentioned, we are starting with a small population, far less than 1 million, so integrating ScanLife in our app would be free.
- **Xcode IDE & Eclipse IDE.** We need these developer programs to actually write and implement Prepper in both iOS and Android. These developer tools are free and available for download on the app store and their official websites.

# Business Strategy

## Brand Position

The Management Study Guide defines brand positioning as “the target consumer’s reason to buy your brand in preference to others.”<sup>2</sup> In an attempt to occupy our market niche, we distinguish Prepper as a practical, convenient, and sleekly designed mobile application.

- **Practical.** Prepper differentiates itself in its purpose of saving time, saving money, and promoting healthiness. On the other hand, Fridge Pal positions itself as “The simple way to manage your groceries,” and Handpick defines its purpose as to “Discover Dishes.” Our focus on practicality allows us to position Prepper as a product with greater usefulness that is applicable to a wider audience.
- **Greatly convenient.** With the inventory, grocery list, and recipe generator functions, Prepper spans the entire cooking process. This combination of interrelated features provides a high level of convenience that competing products cannot. In addition, much of Prepper’s features are automated, contributing another layer of effortlessness to the user.
- **Sleek.** An app’s aesthetic design can differentiate it from the 1.4 million other mobile applications available for download. Prepper’s design emphasizes a modern feel with artistic images of mouthwatering dishes, overlaid on a vibrant palette of bell pepper-themed colors. With these aesthetics, we believe we can market Prepper as a visually-pleasing product that consumers would be more inclined to use.

To summarize, our brand positioning statement is as follows:

*For young professionals who are inexperienced at cooking, Prepper is a mobile application that saves time, saves money, and promotes health. Unlike other cooking apps, our product is uniquely practical, highly convenient, and aesthetically-pleasing.*

## Target Market

Prepper is directed toward young professionals who feel unconfident in cooking or simply lack the time. With the prevalence of smartphones, we appeal to this generation of technologically-savvy consumers in using our mobile application. As rising professionals transitioning to a new lifestyle and budget, Prepper would save them valuable time and money. Our product is friendly to inexperienced cooks as it removes much of the confusion surrounding what to make. While young professionals is our intended market, our product can be enjoyed by all who desire a more efficient method of cooking.

## Sales Plan

As our target consumer is the young, technology-savvy professional, we will market Prepper in a way that reflects this lifestyle. First, we will create a Prepper website that highlights the unique functionalities of our app and features it in accordance with our brand position. To increase awareness, we plan to capitalize on the prevalence of social media by advertising Prepper on popular sites such as Facebook and Google. On Facebook, a Prepper page will be created as a home base for interested Facebook users. Advertisements will be directed to our niche through filters based on demographics, location, and interests. By advertising on Google, we can reach a wider population that include non-Facebook users. Google AdWords, on the other hand, will focus on our audience using keyword searches such as “cooking,” “expired,” or “entry job.” Both methods are likely affordable as we set our own budget based on our desired viewing time or hits received. Through the Facebook Measurement Basics tool and Google AdWords reports, we can analyze the efficiency of our ads by comparing their costs with the number of people reached to determine how we want to proceed.

## Operations Plan

We will use Xcode IDE and Eclipse IDE, programs used for developing mobile apps, to code and implement Prepper. Prepper Version 1.0 and all subsequent versions will then be released on the Apple and Google Play stores for distribution. A download link will also be available on the Prepper website and Facebook page.

## Sales Plan & Pricing Strategy

Prepper will be free for download to the user. Our method of generating revenue will be from partnerships with supermarkets. A walkthrough of one such potential partnership with the local Pittsburgh chain, Giant Eagle, is demonstrated below.

As a notable supermarket chain and one of the largest private companies in the United States, Giant Eagle has successfully marketed to and served roughly 4.6 million customers annually.<sup>3</sup> Moreover, Giant Eagle is especially popular among college students and young professionals in the greater Pittsburgh area. With the ability to automatically inventorize the consumer's groceries and notify customers of recent sales, Prepper will be able to help Giant Eagle reach out to a greater number of customers and better meet the individual needs of a variety of clients. Through the development of Prepper, we hope to demonstrate significant achievements, garner lasting results, and create a symbiotic relationship between Giant Eagle, regular consumers, and us.

According to our research, the Carnegie Mellon and University of Pittsburgh communities consist of roughly 40,000 people in total, with 10,000 people currently shop at one or more of the three Giant Eagle locations in the Oakland area.<sup>5 6</sup> Furthermore, results of our consumer survey show that 82.7% of customers are more likely to go to another supermarket if they are aware of the sales of the supermarket. With advertisements of local grocery store promotions and sales, not only will consumers be able to save both money and time, but the targeted advertisements will help Giant Eagle bring in customers that currently shop at other grocery stores, thus widely increasing their customer base. This will help Giant Eagle secure current customers as well as gain an edge over other grocery stores in the area such as Trader Joe's and Whole Foods.

Statistical analysis of Giant Eagle's balance sheet currently shows annual sales of \$9.3 billion split among 218 grocery stores.<sup>3 9</sup> Estimated with a profit margin of 1.3%, this yields a monthly profit of around \$46,000 per grocery store.<sup>1</sup> By charging each grocery store a reasonable \$250 a month, we will be able to cover the cost of using the Yummly API while Prepper helps to expand Giant Eagle's customer base.

## Cost Breakdown

<b>Prepper Balance Sheet: Current</b>			
	<b>2015-2016</b>		<b>Additional Notes</b>
	<b>Debit</b>	<b>Credit</b>	
<b>Projected Revenue</b>			
Assets			
Cash (Initial Investment)	\$3,000		
Accounts Receivable			
Giant Eagle #38	\$3,000		\$250/ month/ grocery store
Giant Eagle #40	\$3,000		
Giant Eagle #63	\$3,000		
Total Revenue	\$12,000		
<b>Projected Costs</b>			
Liabilities: Accounts Payable			
Yummly API		\$6,000	\$500/month
ScanLife Scanner SDK		\$0	Free up to a million users
EatByDate Database		\$0	Free
Xcode IDE		\$0	Free for Download
Eclipse IDE		\$0	Free in the Apple Store
Total Costs		\$6,000	
<b>Projected Yearly Profit</b>	<b>\$6,000</b>		

## Future Directions

In moving forward, Prepper looks to develop as a modern, convenient app while maintaining sufficient funds for efficient and continuous growth. This goal involves the introduction of a few new and notable features of Prepper as well as a future business plan.

### New Features

In order to maintain a strong user base and attract potentials, Prepper aims to release new features based on projected consumer desires. Catering to the current market trends of increased customizability and social networking, the following additional features are in progress:

- **Personalized accounts.** To enhance customizability, Prepper will incorporate user profiles based on age, weight, dietary restrictions, and more. This will allow more favorable recipes to be matched up with the user.
- **Prepper community.** Using the new user profiles, a Prepper community is to be created for users to rate recipes and comment on pros and cons. It will also be a medium in which they can share recipes and connect over similar health goals.

### Business Strategy: Next Steps

Our current business plan can be improved for a more sustainable budget that can support Prepper in the long-term. This involves a few potential ideas of garnering more income and curbing large expenditures:

- **Initiate a Kickstarter.** By creating a Kickstarter, we can simultaneously safely raise money for further development of Prepper and advertise to new consumers.
- **Raise the cost of store use.** Once Prepper has established itself as a benefit to a grocery store, we plan to raise the cost of the partnership. The increment in which the price is to be increased will be based on the level of business we have given that particular supermarket chain.
- **Increase store partnerships.** Partnerships with other grocery stores will be secured. This will increase our potential user base by including a wider variety of supermarkets.
- **Use an alternative recipe database.** Currently, Prepper's largest expense is the use of the Yummly API. As this cost will only increase with the number of users, a different source of recipes must be obtained for a sustainable budget. A possible course of action is to crowdsource a large number of recipes, but we remain open to ideas.

In the future, a more ideal cost breakdown is as follows:

<b>Prepper Balance Sheet: Future</b>		
	<b>2016+</b>	
	<b>Debit</b>	<b>Credit</b>
<b>Projected Revenue</b>		
Assets		
Cash (Previous Year's Profit)	\$6,000	
Accounts Receivable		
Giant Eagle #0038	\$3,600	
Giant Eagle #0040	\$3,600	
Giant Eagle #0063	\$3,600	
Giant Eagle #XXXX	\$3,600	
Giant Eagle #XXXX	\$3,600	
Giant Eagle #XXXX	\$3,600	
New Grocery Store #1	\$3,000	
Total Revenue	\$30,600	
<b>Projected Costs</b>		
Liabilities: Accounts Payable		
Our Own API		\$0
ScanLife Scanner SDK		\$0
EatByDate Database		\$0
Xcode IDE		\$0
Eclipse IDE		\$0
Total Costs		\$0
<b>Projected Leftover Revenue</b>	<b>\$30,600</b>	

*This revenue will be used to pay off additional prospective costs, such as that required to hire a programmer.*

As Prepper develops and gains popularity, a continuous cycle of market testing, product revision, and product re-release will be implemented for maximum consumer approval. Once Prepper has a solid foundation in Pittsburgh, PA, we hope to introduce it to the entirety of the United States and change the way we cook.



# Sources

<sup>1</sup> Ben-Anchour, Sabri. "Groceries: A Low Margin Business, but Still Highly Desirable." Groceries: A Low Margin Business, but Still Highly Desirable. Marketplace: Business, 12 Sept. 2013. Web. 28 May 2015.

<sup>2</sup> "Brand Positioning - Definition and Concept." Management Study Guide, n.d. Web. 02 June 2015.

<sup>3</sup> "Class Profile." Office of Admissions and Financial Aid Class Profile Comments. University of Pittsburgh, 2014. Web. 28 May 2015.

<sup>4</sup> Cross, Miriam. "Confusing Packages Lead to Wasted Food, Money." Kiplinger, n.d. Web. 04 June 2015.

<sup>5</sup> "Giant Eagle® Quick Facts." Our History. Web. 28 May 2015.

<sup>6</sup> Howard, Caroline. "Top Colleges 2014: Carnegie Mellon University." Forbes. Forbes Magazine, 30 July 2014. Web. 28 May 2015.

<sup>7</sup> Ling, Biing-Hwan. "Food Consumption & Demand: Food-Away-from-Home." USDA Economic Research Service, n.d. Web. 05 June 2015.

<sup>8</sup> "MOBILE MILLENNIALS: OVER 85% OF GENERATION Y OWNS SMARTPHONES." Nielsen, n.d. Web. 04 June 2015.

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<sup>11</sup> "Yummly Recipe API Documentation." Yummly, n.d. Web. 02 June 2015.