

PRD: FreshPick

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Vision

Our vision is to create a world where everyone can easily access and enjoy healthy, sustainable food without waste.

For single, young adults (in their 20s and 30s) who must balance cooking for one while utilizing ingredients that are sold in quantities designed for families, our product is a modular refrigerator attachment system that automatically monitors the food in the fridge to avoid food waste.

Unlike apps that are currently designed to keep people up-to-date on the food left in their fridge, FreshPick's refrigerator attachment does not require upfront work by the user to input all their ingredients into the software. Instead, our device will monitor the food in the fridge and provide real-time notifications when food is about to expire or go bad, allowing customers to use their ingredients before they go to waste.

FreshPick aims to make grocery shopping and cooking more efficient for single-young adults. We envision the future to be one where people are more conscious and aware of their consumption and contribute to a sustainable future. [See Appendix 1 for Context]

Motivation

Our motivations stem from the struggles and pain points faced by our target users, such as Jamie, Blake, Sam, Christopher and Christine. These individuals often face challenges in using their food before it expires, forgetting what they have in their fridge, and lacking a plan when grocery shopping. They resort to frozen foods, takeout or repetitive meals leading to food waste, overspending, and unsatisfying eating habits. FreshPick aims to address these issues by providing real-time motivation, recipe suggestions and inventory management tools that help users utilize their groceries efficiently, save money and enjoy healthier meals.

Personas

Just Jamie



Profile:

Jamie, 27 years old.

A paralegal working at a top law firm in the city (busy working professional).

Lives alone, with a corgi named Max.

Health conscious - likes to go to the gym but struggles to stick to a routine.

Each week looks different, and does tasks whenever there is time.

Likes to cook but is very busy - ends up resorting to frozen food.

Thinks she'll have more time than she does to cook - ends up throwing away food because it goes bad before she can eat it.

Likes to bring lunch to work but runs out of time in the mornings.

She is optimistic about the grocery shopping and meal-prepping experience, but it is hard for her to follow through on it.

Jamie's Problem:

She ends up throwing away food because it goes bad before she can eat it.

She doesn't know what she has in her refrigerator.

She doesn't have a plan when she goes to the grocery store and often buys what she already has.

Her fridge is full of ingredients that she struggles to turn into meals because she never knows what is in there.

She ends up eating a lot of canned or frozen food and takeout instead of cooking, leaving her fresh ingredients to go bad.

Jamie's Goals:

To reduce food waste both for the planet and to save money by not repurchasing the same food week after week, just to throw it away.

To turn her produce into meals made with fresh ingredients.

Don't throw away more than 10% of the produce she buys.

Bachelor Blake



Profile:

Blake, 25 years old.

Ph.D. student at a top research institution (always busy and on the move).

Likes to spend time with his friends and go out on the weekends, so cooking is the last thing on his mind.

Lives alone and often forgets what food he has in the fridge.

Health conscious - goes to the gym regularly and has aspirations to cook healthy meals.

Each week looks different, and does tasks whenever there is time.

Likes to cook and, in his busy life, relies on having the right food at home when he gets there.

Resorts to ordering take out on busy nights so he does not have to think about cooking.

He is always buying specific ingredients for a recipe, and forgetting what he has until it goes bad and turns into food waste.

Blake's Problem:

He is forgetful and can never remember what he has, or that he has to cook at all.

He rarely knows what food is in his fridge and what is closest to going bad.

He does not meal prep, or plan ahead when grocery shopping, so typically, the food he has is a mismatch of ingredients.

He struggles to cook with the ingredients he has and doesn't have a good way to monitor his groceries.

He spends too much money on takeout and eating out at restaurants for his budget.

Blake's Goals:

To reduce food waste both for the planet and to save money by not repurchasing the same food week after week, just to throw it away.

To spend more time cooking and less time ordering food, specifically to cook at least 50% of his meals each week.

Don't throw away more than 10% of the produce he buys.

Single Mom Sam



Profile:

Sam, 28 years old, and Layla, 3 years old.

Single mom who works as a teacher during the day, and a tutor during evenings and weekends.

Keeping Layla safe, happy, and healthy is the most important thing to her, and being a mom is her favorite part of her life.

Lives in a small apartment just big enough for the two of them and is very budget conscious.

Tries to cook healthy meals, and usually, her meals end up being the leftovers from whatever Layla leaves behind on her plate.

Each week looks different, between work and having a toddler, there is little consistency

Tries to plan ahead for the meals each week to carry over as leftovers since she has to pack Layla a lunch for daycare each day.

Sam's Problem:

She often exceeds her weekly budget by buying food she does not realize she already has at home.

Layla can be a picky eater, so meals tend to stay consistent, which can be difficult for Sam, who forgets what food she has in her fridge.

She struggles to find new recipes that utilize the food she already has when Layla decides she doesn't like a certain food anymore.

She struggles to cook with the ingredients she has, and doesn't have a good way to monitor her groceries.

Sam's Goals:

To reduce food waste both for the planet and to save money by not repurchasing the same food week after week, just to throw it away.

To stick to her budget each week and save money by not repurchasing food unnecessarily.

Be aware of what food she still has when she goes grocery shopping.

Coupled Up Christopher and Christine



Profile:

Christopher, who is 29 years old, and his long term girlfriend Christine, who is 27 years old, live together in a two bedroom apartment

Christopher works remotely from their apartment, while Christine works an in person job

Spends \$400/month on groceries, unless they're traveling, then \$250-\$300

Lives in a small apartment just big enough for the two of them and is very budget conscious.

Likes to see all of their groceries rather than sticking them in drawers so they remember what food they have.

Plans to use food in her fridge by making 2 dinners each week and having leftovers for lunch when working from home

Chris and Chris' Problem:

Throws away produce once a week and estimates wasting \$20-30 of food each week
They're interested in reducing food waste but it's not on the top of their priority list right now

Doesn't currently use or know of any food tracking apps

Both are so busy with work, they always think it is the other person's turn to plan and make dinner

Neither enjoys cooking, so it always feels like a chore, especially when it requires a trip to the grocery store since they do not have the right ingredients.

Chris and Chris' Goals:

To reduce food waste both for the planet and to save money by not repurchasing the same food week after week, just to throw it away.

To reduce food waste to \$5-\$10 each week, a 65-75% decrease from their current habits

Get recipe inspiration from TikTok and other internet sources, then decide what is easiest and most affordable to stay on budget and not wait until they're hungry to decide what recipes they have the ingredients for and can make.

Stop arguing about who has to cook, and what they are going to cook.

Unmet Needs

For each persona that is being targeted, there is an emphasis on a struggle to know what foods they have and shop accordingly to avoid food waste and allow them to have the right food to cook healthy and complete meals. Based on interviews with people that fit our target user, it became clear that food waste is most frequently occurring because the person forgets about an item in their refrigerator (i.e. fresh spinach), or they did not see it because it was in a drawer or in the back of their refrigerator.

Customer Problem:

FreshPick wants to target single people in their 20s and 30s who struggle to use their food before expiration when shopping and cooking for one when not in the market for new appliances.

Proposed Solution:

We believe that there is an opportunity to create an integrated add-on to existing refrigerators to help individuals log and utilize their food more efficiently to avoid food waste.

Hypotheses:

- H1: I believe people struggle to shop for one, and grocery store portions are typically too large to be consumed by a single person.
- H2: I believe food goes bad because people forget what food they have in their fridge.
- H3: I believe that the food that is not being eaten is all being thrown away as waste.
- H4: I believe that the people struggling with food waste the most are not in the market to buy a new refrigerator.
- H5: I believe that even when people know what food they have in their fridge, it can be difficult to ideate recipes that incorporate those ingredients.

When validating these hypotheses by interviewing individuals who fit the personas, here is a selection of the questions that will be asked. [Appendix 2 for additional questions and details]

1. How do you decide what groceries to buy?
2. How do you store your produce?
3. What produce do you have right now, and what are you planning to do with it?
4. Walk me through your current shopping, storing and meal-prepping experience. What does your ideal experience look like?
5. What are some of the reasons why you think food waste is a problem, and why do you think it's important to address this issue?
6. What are some of the challenges you face in reducing food waste daily, and how do you try to overcome them?
7. How do you think your lifestyle and habits contribute to food waste, and what changes could you make to reduce your impact?
8. How do you feel about your own efforts to reduce food waste, and what motivates you to continue working on this issue?
9. Can you describe a specific scenario where you struggled with food purchasing, portioning, or waste?

Research Conducted:

Research was conducted in the form of interviews and surveys that explored users' current habits, routines, and pain points in their routines. By speaking to users who fit

the outlined persona and user criteria, it helped develop more accurate hypotheses of current behavior and unmet needs to design around. Additionally, short surveys will allow us to gather meaningful quantitative data to better characterize the causes and effects of food waste.

Outlined in *Figure 1* is the affinity mapping completed as a result of the interviews which categorized the feedback collected from users about their grocery shopping, eating, food waste, and lifestyle tendencies.

These specific interviews and instances led to a few specific unmet needs to be surfaced, the first being that users forget about food in their fridge, most commonly fresh produce, and then it goes bad and turns into food waste. A second unmet need was not being able to strategically grocery shop to utilize the food they already have, and just supplement with other necessary ingredients, when planning to cook. Users will repurchase food that they already have out of fear they do not have enough, since it can be hard to measure and track with opened, and partially used products. The third main unmet need revolves around users freestyling their cooking, and not using ingredients for a recipe that they intended to, also leading to food waste.



Figure 1: Affinity diagram of research collected during interviews

Customer Journey:

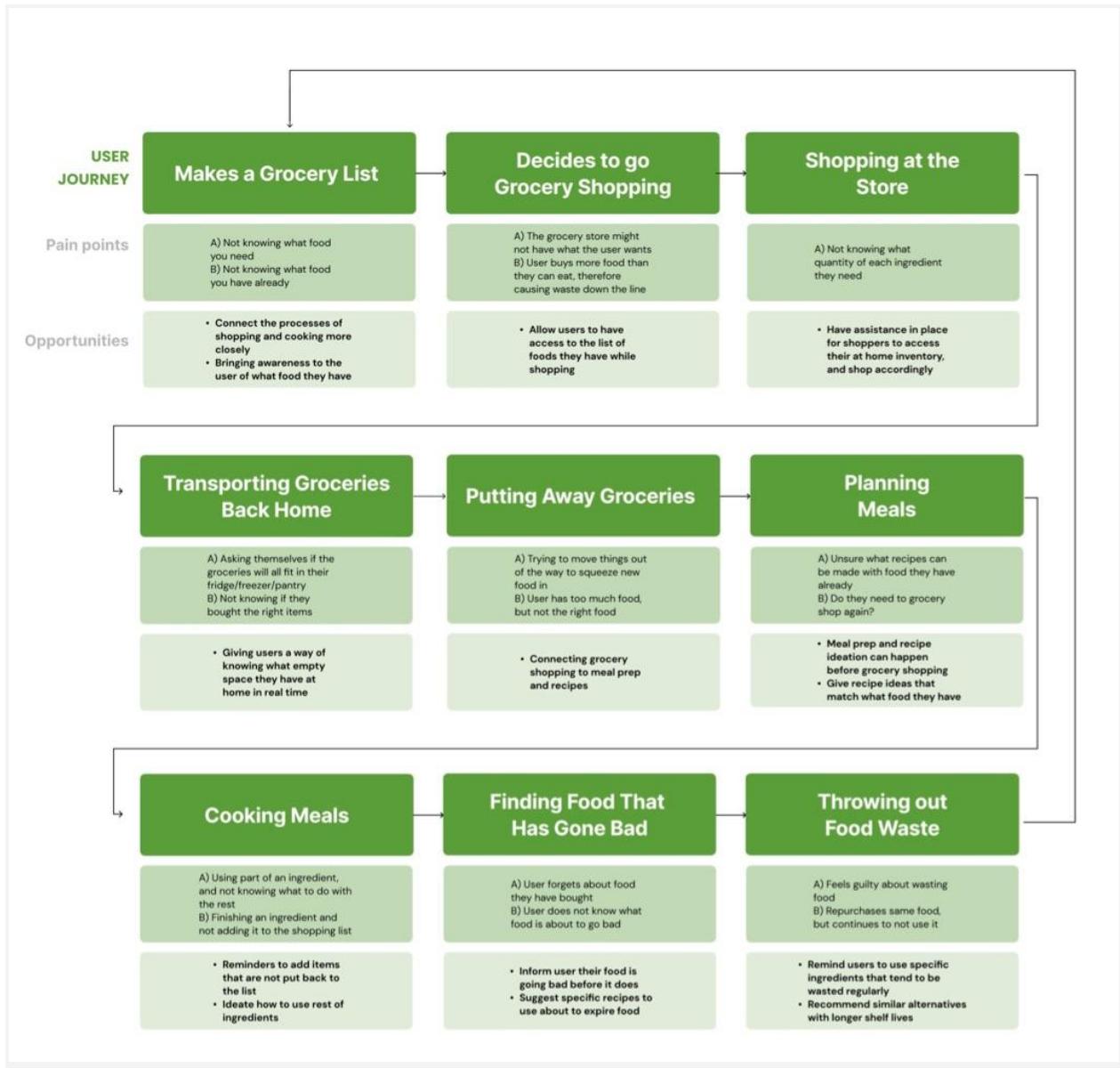


Figure 2: Journey map of user without FreshPick

Expansion on Unmet Needs:

1. Users forget about food in their fridge
 - a. When produce is stashed away in drawers, and not easily visible to the user, they are prone to forgetting that they have purchased it, and had any intention of using it at all. For food that expires quickly, like spinach, there is a small window of use, that when food is “out of sight, out of mind,” it can be easy to miss.
2. Users overbuy and do not utilize existing food
 - a. When a user is shopping for a specific recipe, without knowing for sure that they have the proper ingredients at home to make it, they tend to

just repurchase it again to be safe, regardless of if they have it or not.

Users have no way of currently accessing their fridge and pantry inventory at the store when they have not checked before leaving their house.

3. Freestyle while cooking, and does not know how to use ingredients in future recipes

- a. When making recipes on the fly, the user does not always know exactly what to make with all ingredients. Based on our interviews, we found some users will only buy produce that is on sale or "looks good" to them when in store. Therefore, they do not have a true plan for using the groceries throughout the week.

Existing Solutions

There are three categories of products that currently provide customers with means to track their stock of foods and provide reminders and recommendations to use expiring products. These categories are apps, refrigerator magnets, and smart refrigerators. Within each category, there is a variety of features that different products provide that are explained in detail below:

Category 1: Apps

There are a plethora of free apps that offer inventory and expiration tracking, recipe recommending, and shopping list building. Epicurious provides recommendations for recipes based on certain ingredients entered into the app and creates shopping lists based on recipes users want to make. Cooklist makes inventory tracking easier by connecting to grocery store accounts such as Walmart, Mariano's, Target, Kroger, etc. It also creates grocery lists based on recipes and can organize them based on products' locations in stores and compare prices at different grocery stores, and place pickup orders. Additionally, it provides notifications when foods are close to expiring, although expiration dates have to be manually edited by the user. It also has a "pro" version for a \$49.99 annual subscription that allows users to customize and import recipes, recommend recipes based on their stock, and includes pantry tracking. Pantry Check manages inventory by providing a barcode scanner and a method for manually entering product information. It has a database of products that all users can contribute to. It displays the time until product expiration for every product on the inventory page within the app. It sends notifications to remind users of upcoming expiration dates (that will need to be edited if they are different from what the app predicts at the time of entering the product into the app inventory). It provides an option to add products that are used up to the shopping list and shows prices at nearby stores. NoWaste is similar to pantry check in its inventory and expiration management, but it adds a feature of

tracking the amount of wasted food as a percentage of all food tracked through the app. Neither Pantry Check, nor NoWaste offers any recipe or meal-planning services.

Category 2: Refrigerator Magnets

Refrigerator magnets provide a constant visual reminder of produce on the outside of the fridge. There are two types of food inventory magnets: magnetic grocery inventory/shopping notepads and magnets of individual food products that can be grouped and moved into categories at the user's discretion. The magnetic notepads cost about \$9-15 and provide an easy way for the user to take the list with them when they go shopping. The grocery item magnets cost about \$18-35 but require the user to transfer the list to a physical note or a note on their phone to take with them to the grocery store. For both refrigerator magnet products, it is necessary for the user to check their own inventory to update the lists manually.

Category 3: Smart Refrigerators

Smart refrigerators provide ways for list-making and online grocery ordering at the same location where the food is stored. Some refrigerators, such as LG's ThinQ Refrigerator, provide ways to view what is inside the refrigerator without opening it by turning a window on the door clear by knocking on it. Others, such as Samsung's SmartThings Refrigerator, have connections to online grocery ordering sites like Amazon Fresh and provide recommendations for recipes based on the food in its inventory. As of now, there are no smart refrigerators that don't require manual entry of all products manually into its inventory.

Existing Solutions Matrix

	Cost	Actions required to keep track of food	Methods to encourage food consumption	Shopping list features	Meal planning/Recipes?
Epicurious	Free	N/A	Provides recipes based on inputted ingredients	Creates list based on recipes you want to try	Yes
Cooklist	Free	Connect to walmart, target, or kroger, etc. account. Barcode scanner, store receipt scanner, manual selection	Notifications when food is expiring	Build lists based on recipes. Compare grocery prices, organize by isle, order pickup	Yes

Pantry Check	Free	Barcode scanner, manual entry	Displays time until expiration of every product, best by notifications	Restock button on products that run out (percent usage tracked), prices at nearby stores	No
NoWaste	Free	Barcode scanner, manual entry	Waste tracker (waste percentage), expiration tracker	automatically add essentials that run out	No
Grocery list notepads	\$9-15	Manual	N/A	Check what you need	No
Grocery magnets	\$18-35	Manual	N/A (Visible on outside of fridge)	N/A	No
LG ThinQ Refrigerator	\$2,999	Manual, InstaView Technology	N/A	N/A	No
Samsung SmartThings Refrigerator	\$2,899	Manual	Recipe suggestions	Easy online ordering	Yes

What most of the existing products are missing is the ability to add items to the product's digital inventory with no work required from the customer. Cooklist does this best by connecting to shopper's grocery store accounts so that foods they buy are automatically added to their inventory. This has limitations, however, which include adding foods that somebody buys to give to somebody else and adding foods that weren't purchased at a store the shopper has an account at.

FreshPick's opportunity in this market is to combine many of the features of existing products (easy inventory management, expiration reminders, recommendations of how to use available food). The main unmet need from existing products is easy inventory management that doesn't require users to manually enter their foods or scan receipts. A challenge will be to make the product valuable enough to customers that they will choose it over the free inventory tracking apps.

Unit Economics:

Economics are outlined here:

https://docs.google.com/spreadsheets/d/13DjvyZIFD5LVBmDLaB_0bF0LBGMgclTfMwKAWxYGqL0/edit#gid=128996941

The costs for the hardware portion of our solution would entail the raw materials, a co-manufacturing tolling fee, logistics (freight, warehouse costs) and selling directly to consumers or to retailers. We would seek a 50% margin on the hardware component,

with the goal of increasing margins by 20 to 30% as Freshpick achieves economies of scale.

Additionally, there are costs to both Freshpick and the consumer for the software component of this solution. For FreshPick, this app would have the opportunity to collaborate with online recipe sites such as Allrecipes, which would be a premium feature for the user. The user would be able to follow a 'freemium' model, where there is a free version available, with additional features available for a subscription cost. By having a partnership with a secondary company with an established customer base such as Allrecipes, the advertising and marketing costs for FreshPick could be reduced as they target the existing customers of their partner. With the premium version that customers are able to purchase, they will be getting access to additional features such as

- Adding personal recipes
- Access to recipes from chefs
- More capacity for how much food you can log in the app
- More personalized alerts and reminders based on your own usage and schedule

Differentiation

FreshPick is the first service of its kind to make use of the produce and food that consumers already have in their refrigerator before expiration. Currently the market is saturated with meal kit services like HelloFresh, Blue Apron, and Marley and Spoon which are helping with meal prep and recipes. While these services minimize food waste, they do not give consumers the opportunity to get creative with their meals and they are typically formatted to feed 2 to 4 people. Although ideal for busy couples and families, there is a whitespace for individuals cooking for one. An added disadvantage of these meal kits is that they do not provide real time access to the knowledge of what food you have, when it is going to expire, and a place to document recipes and track food waste. Existing products and services do not integrate meal prep and recipes with expiration date tracking and a full camera view of the food a customer has in order to provide the most holistic and accurate approach to cooking.

FreshPick enables consumers to build recipes from their existing produce before it expires. Since FreshPick is focused on the needs and desires of busy professionals, it suggests meals that can be cooked and consumed as 1 portion or, as leftovers for the next day. FreshPick's grocery surveillance, expiration reminders, and meal suggestions, address the unmet need of busy working professionals cooking for one by providing convenient and healthy meal options that minimize food waste. This allows customers

to eat wholesome meals without resorting to frozen meals or unhealthy takeout, saving time and promoting better health outcomes.

Why Now?

We believe now is the time to solve the unmet need of busy working professionals cooking for one. While there are copious health and wellness focused products and services on the market, we have found that healthy cooking for one - and making use of existing groceries - is a huge opportunity space. Rather than resorting to frozen meals or unhealthy takeout, consumers using FreshPick can relish the fact that they can eat wholesome meals all while minimizing food waste.

According to a survey by the Hartman Group, approximately 46% of all eating occasions in the US are done by people who are eating alone. This trend is expected to continue to rise, as more people are living alone or have busy schedules that make it difficult to prepare meals from scratch. Additionally, a survey conducted by the Food Marketing Institute found that 58% of consumers are looking for quick and easy meal solutions. There is a growing need for healthy and convenient meal suggestions for individuals who live alone, that utilizes food they already have. This need can be met by products and services that offer healthy meal options and minimize food waste, such as FreshPick.

Key Path Scenarios

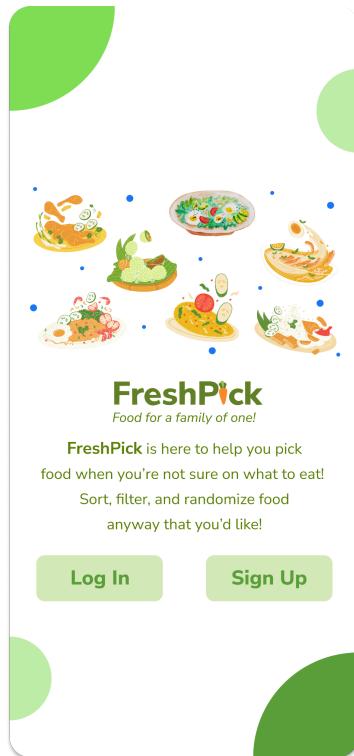
To illustrate the user experience with FreshPick, let's take the example of Jamie, a busy 27-year-old paralegal. Here is a visual walkthrough:

1. Jamie purchases her FreshPick system, which includes her fridge and pantry shelving inserts with cameras to monitor her stock, and stream the feed to the app.
2. Jamie installs her shelving system, and replaces her food back into its appropriate spot.
3. Jamie logs her food, and its expiration date into the app, so it is able to prompt her when food is about to expire.

4. Jamie opens the app and see onboarding page that prompts her to "start cooking"



5. After the onboarding page, Jamie is prompted to either log in or sign up for an account on the FreshPick app. Jamie already has an account, so she chooses the "login" button.



6. Jamie logs in with her username and password that she has already established within the FreshPick system.

9:41 ⚡

← **Login**

Email Address

Enter Email Address

Password

Enter Password

Login

[Forgot password?](#)

or continue with

G Login with Google

F Login with Facebook

7. After logging in, Jamie is directed to the main page of the app where she is able to explore recipes, and access the other tabs and features of the app.

19:27

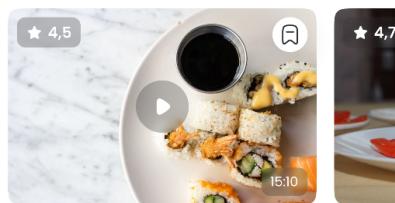


You have 13 ingredients in
fridge, find recipes:

Search recipes

Trending now 🔥

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How to make sushi at home ··· How to

By Niki Samantha

By

Popular category

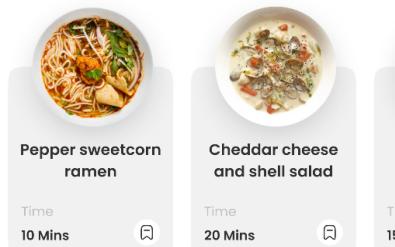
Salad

Breakfast

Appetizer

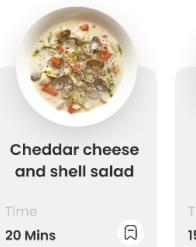
Noodle

Lui



Pepper sweetcorn
ramen

Time
10 Mins

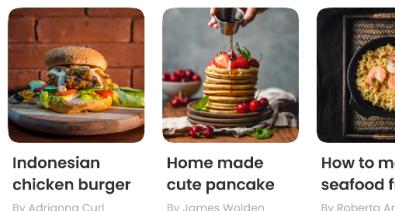


Cheddar cheese
and shell salad

Time
20 Mins

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By Adrianna Curl



Home made
cute pancake

By James Wolden

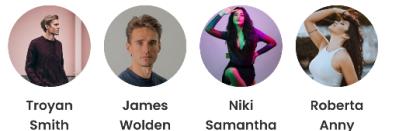


How to make
seafood fr

By Roberta An

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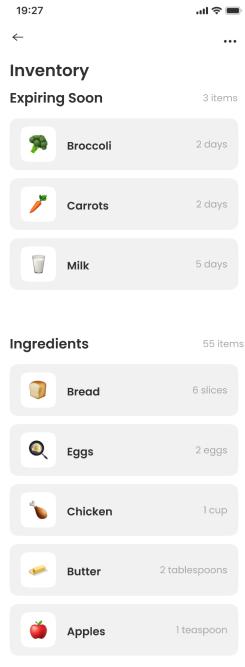
James
Wolden

Niki
Samantha

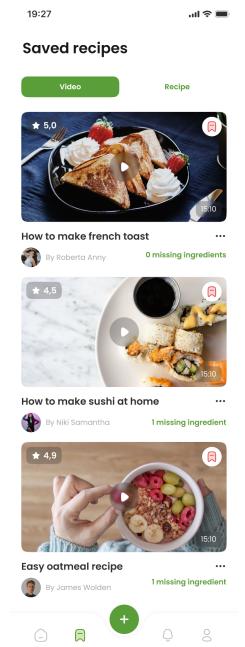
Roberta
Anny



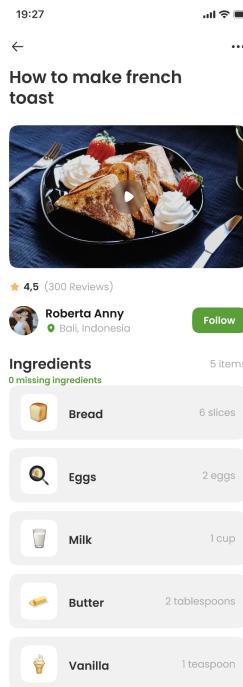
8. Jamie clicks the “+” button from the main page in order to access and upload new inventory, as well as to see what food is expiring soon, and a full inventory of all ingredients she has at home.



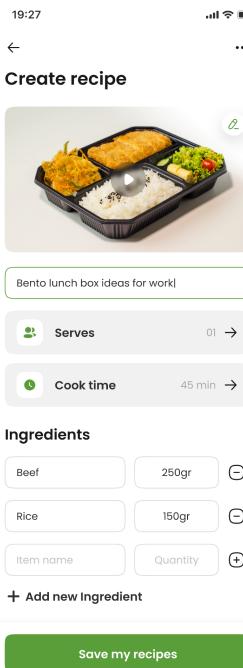
9. After updating her food inventory, Jamie goes to the second tab of the app to see her saved recipes.



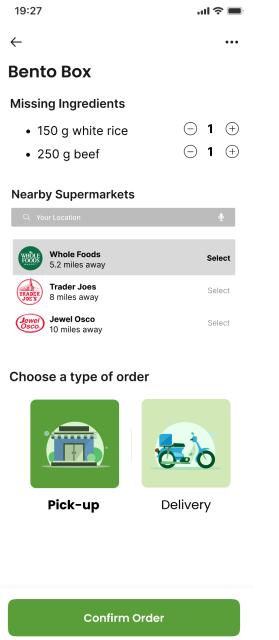
10. She clicks on the french toast recipe to determine if she has all the ingredients to make this recipe for an upcoming meal.



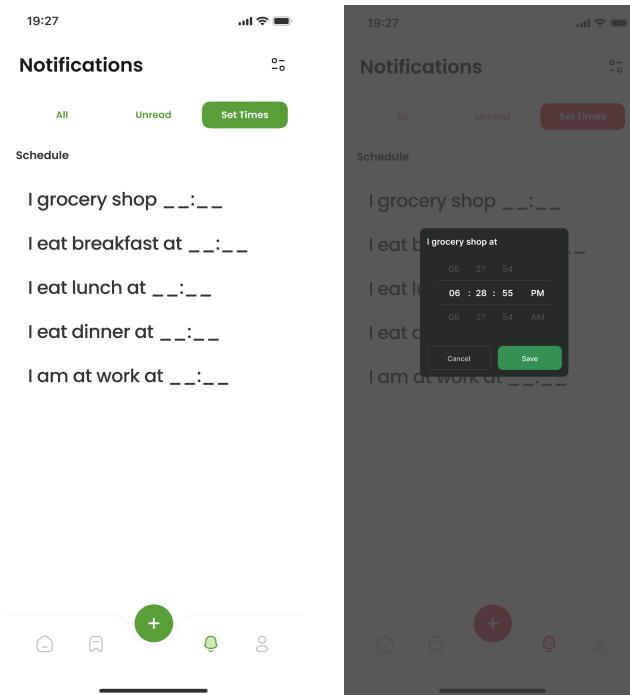
11. Next, Jamie wants to add a new recipe for a bento box, which she is able to do from the page illustrated in step 6, but clicking the "+" button on the bottom panel of that app page



12. In order to make this recipe, Jamie needs a few new ingredients, and she is able to order them through the app either for pickup or delivery to conveniently make this recipe before the other ingredients she has go bad, and to help eliminate over shopping.



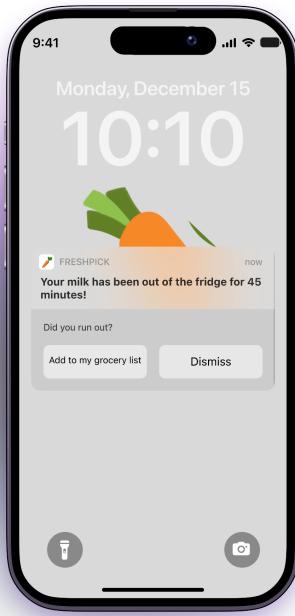
13. After adding her new recipe, Jamie going to her notifications tab to update her times that she typically shops and eats so that notifications going to her phone are arriving at appropriate times



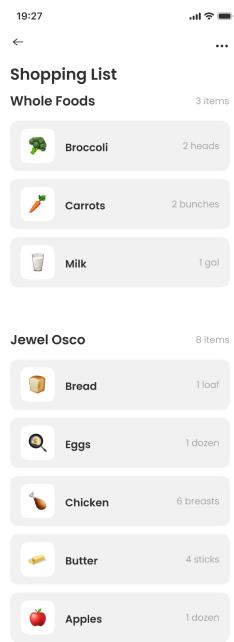
14. Jamie finally accesses her profile page in order to see her waste report and get insight into how her habits have changed since beginning her journey with FreshPick

The screenshot shows Jamie Blair's profile page. At the top, there is a header with the time 19:27 and signal strength indicators. Below the header, the title "My profile" is displayed next to a three-dot menu icon. A circular profile picture of Jamie Blair is shown, with an "Edit profile" button to its right. Her name, "Jamie Blair", is listed below the picture. A bio text states: "Hello world I'm Jamie Blair, I love cooking so much!". Below the bio, there are statistics for "Recipe" (3), "Videos" (13), "Followers" (14K), and "Following" (120). Two buttons are visible: "Favorite Recipes" and "Waste Report". The "Waste Report" button is highlighted in green. Three cards are displayed below: "Food Waste" (a bar chart showing waste levels for January, February, March, and April), "Money Lost" (an empty card), and "Money Spent on Groceries" (an empty card). At the bottom, there is a navigation bar with icons for Home, Bookmarks, a central plus sign, Notifications, and Profile.

15. After closing out of the app, Jamie begins to cook. While cooking, she runs out of milk and the FreshPick system notices she does not return the milk to the fridge and sends her a notification giving her the option to add it to her in-app grocery list.



16. Jamie chooses to add the milk to her shopping list, so the next time she goes to the store, or orders groceries directly from the app, she is prepared to get all the food she needs. She is even able to split her grocery list among different stores she likes to shop at.



17. When Jamie goes to the grocery store, she sometimes forgets what is in her fridge, and uses the feature on the app to access the installed hardware with cameras to visualize what is currently in her fridge. As and when she uses it, she upgrades the hardware and software to stay updated.



Detailed Design & Features Description

Design Principles

Hardware (Shelving and Camera System):

- Customizable to all refrigerators
- Easy to pair to a smartphone
- Sleek and simple appearance
- Maintains full storage space in kitchen
- Monitors only food and cooking activities
- Energy Efficient: Prioritizes energy efficiency to minimize power consumption with intelligent sensors
- Easy Maintenance: Design the hardware component for easy maintenance and upkeep (self-diagnosis to troubleshoot and repair)
- Scalable and Modular: Allows for future upgrades (potentially integrating with other smart home devices)

Software (Freshpick App):

- User-friendly interface: Easy to navigate and understand

- Seamless integration: Between app and hardware component
- Simple images depicting food
- Consistent: Maintain consistent design language and user interface throughout the app (visual elements, terminology, etc.)
- Easy and intuitive to use: Design the app with intuitive interaction patterns and gestures.
- Personalization and Customization: Adjust/set preferences, setting and tailor the app to the specific needs and preferences of users.
- Accessible
- Shareable
- Real-time Monitoring and Notification: Enables real-time monitoring of food-related activity and provides timely notifications or alerts to users. Keeps users informed about inventory level, expiration date, or any relevant updates to make informed decision-making.

Back End:

- Closed circuit TV: the cameras that have access to the fridge and cabinets in a kitchen are on a closed circuit and only accessible by the devices linked specifically to that hardware
- Agile: Easy to implement and remove both physical and digital elements of Freshpick
- Low maintenance: Once the system is implemented, there is no adjustment or update needed for the physical aspect of this product
- Easy to fix: There is extensive online help and step-by-step help to fix any issues with either the physical or digital elements of Freshpick
- Data Privacy and Security: Prioritize privacy and security of user data within the app with data encryption and adheres to privacy regulations.
- Seamless integration: Both the hardware and software (app) pair together with ease and communicate with each other regularly.
- Some tech principles: Based on supply needs, our ethos on our hardware could be outsourced oversee.

Features

Hardware

Feature Name	Description	Dependencies	Priority
Camera system	A gimbal-mounted camera module that can be placed in the fridge or in a pantry and can be accessed	<ul style="list-style-type: none"> - App control - Mounting system - Whole kitchen monitoring - expanded camera 	Version 1

	and controlled remotely through the app	<p>system (version longterm)</p> <ul style="list-style-type: none"> - Engineering, quality assurance, and manufacturing 	
Camera mount	Camera mounts that fit different kitchen geometries (shelf, fridge door, ceiling mount) along with non-invasive mounting hardware	<ul style="list-style-type: none"> - Camera system - Engineering, quality assurance, and manufacturing 	Version 1
Scale mat	A flexible mat that has built-in pressure sensors that can detect the location and weight of an object. This will be able to translate into quantity based on the type of food (by weight or by unit)	<ul style="list-style-type: none"> - Fridge/pantry size and shape - App inventory tracker - Scale shelf (if they have it) - Engineering, quality assurance, and manufacturing 	Version Next
Scale shelf	An expandable shelf that has built-in pressure sensors that can detect the location and weight of an object. This will be able to translate into quantity based on the type of food (by weight or by unit)	<ul style="list-style-type: none"> - App inventory tracker - Scale mat (if they have it) - Engineering, quality assurance, and manufacturing 	Version Next
Whole kitchen monitoring	Camera(s) mounted to view the entire cooking area (counters, cooking surface - does not show a full view of the kitchen or the people in it)	<ul style="list-style-type: none"> - Camera control system (app) - Mounting system - Legal, engineering, quality assurance 	Version Longterm
Cutting board scale	Cutting board with scale built in to	<ul style="list-style-type: none"> - Recipe guide - Engineering, quality 	Version Next

	detect weight of ingredients on chopping block to match with recipe requirements	assurance, manufacturing	
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Software

Feature Name	Description	Dependencies	Priority
Inventory Tracker	List of all current items in inventory as detected by the camera system image recognition and in Version Next, the weight of each item	- Camera system - Scale shelf - Engineering, software developers	Version 1 and Version Next
Fridge view	Live footage of the contents of the refrigerator with controls of the gimbal mounting system to change angle of view	- Camera system - Camera mount - Engineering, software developers, quality assurance	Version 1
Grocery List	Editable grocery list that automatically adds "favorited" items that are no longer in stock as detected by camera system and confirmed by reminder alerts	- Camera system - Reminder alerts - Software developers	Version 1
Expiration Date Tracking	Countdown until expiration for each item in inventory. Users can manually enter expiration dates printed on packaging or the camera system can determine expiration based on date of appearance in the	- Camera system - Software developers, food science subject matter experts	Version 1

	refrigerator		
Reminder Alerts	Push notifications to the user when an item has been out of the refrigerator for over 1 hour. Asks user if they have run out of ingredient and want to add it to grocery list	- Camera system - Grocery list - Software developers	Version 1
Recipe suggestion	Recommends recipes based on ingredients available or that are expiring soon	- Camera system - Expiration Date Tracking - Recipe database - Software developers, food science subject matter experts, dieticians	Version Next
Meal planning	Builds grocery list and recipe plan based on user preferences	- User inputs (dietary requirements, budget, taste preferences) - Recipe database - Software developers, food science subject matter experts, dieticians	Version Next
Grocery list suggestions	Suggestions to grocery list based on items that have a low weight remaining and chosen recipes or meal plans	- Scale shelf - Recipe and meal planning database - Software developers, food science subject matter experts, dieticians	Version Next
Virtual cooking assistant	Audio guide through recipe instructions. Provides feedback on performance during preparation and	- Cooking board scale - Kitchen camera - Software developers, chefs or	Version Longterm

	reminders to tend to stove, oven, etc.	professional cooks, audio experts	
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Suggested Information Architecture

Model	View	Controller
Food Ingredient ➢ Name, brand, quantity/weight, location, time of purchase/addition, date unsealed, freshness period Food Meal ➢ Name, ingredients used, amount, location, date cooked, freshness period	Inventory screen ➢ Fridge/Pantry/Freezer ○ Shelf/drawer, container ➢ Name, quantity/weight, date added, good for ➢ Buttons: ➢ Add, edit, delete	Inventory controller - manages communication between inventory screen and inventory manager. ➢ Display inventory ➢ Handle inventory action
Recipe manager ➢ Name, personal or public, ingredients, (in stock, to buy) time to cook, serving size, cooking instructions, status of recipe (favorited, in a meal plan, etc.)	Recipe screen ➢ My recipes, favorite recipes, recommended recipes (web), curated recipes , sort by cook time, sort by time of day/meal type, shows how many ingredients need to be purchased Buttons: ➢ Add new, delete, favorite, search bar, ingredient filters	Recipe controller - manages communication between recipe screen and recipe manager ➢ Display recipes ➢ Handle recipe action
Expiration Tracker ➢ Date opened ➢ How long foods last before they expire ➢ Days left until foods in inventory are "expired"	Eat Soon screen ➢ List of food items about to go bad ➢ List of meals about to go bad ➢ Prompt to fit into recipes ➢ Option to extend food life (subjective analysis)	Expiration controller- manages communication between eat soon screen and expiration ➢ Display expirations ➢ Handle expiration actions
Inventory manager - manages the collection of <i>food items</i> ➢ Foods in stock, quantity of each food item, location of item in fridge/freezer/pantry/etc.	Recipe detail screen ➢ Ingredients, shopping list, cook time, cook tools, instructions ➢ option to add to favorites, rate after eating	Recipe Detail Controller- manages the communication between the Recipe detail screen and Recipe manager. ➢ Display recipe details ➢ Handle add recipe action
Groceries	Meal Plan Screen	Add Food Controller- manages

<ul style="list-style-type: none"> ➤ Name ➤ Unique ID ➤ Location in fridge ➤ Expiration Date 	<ul style="list-style-type: none"> ➤ Days of week ○ 3 Meals per day ➤ Recipes ➤ Ingredients ➤ Grocery list per time period 	<p>the communication between the AddFoodScreen and InventoryManager.</p> <ul style="list-style-type: none"> ➤ Add food item ➤ Handle food action
<p>Meal Plan</p> <ul style="list-style-type: none"> ➤ Time period (week/month/day), list of breakfasts/lunches/dinners, grocery list, add/see/remove 	<p>Add food screen</p> <ul style="list-style-type: none"> ➤ Image, name, brand, notes, expiration date, barcode scan, optional price tracking 	<p>Search Controller- manages the search functionality in the RecipeScreen.</p> <ul style="list-style-type: none"> ➤ Search recipes ➤ Handle search actions
	<p>Grocery Screen</p> <ul style="list-style-type: none"> ➤ Shopping list (sections for produce, meats, grains, dairy, sauces and season, other category), name, quantity needed, date of meal planned if relevant ➤ Buttons ➤ Add, delete,edit 	<p>Notification Controller- manages the expiration date notifications for food items.</p> <ul style="list-style-type: none"> ➤ Set alert ➤ Handle alert action
	<ul style="list-style-type: none"> ➤ Meal plan detail screen, meal (breakfast/lunch/dinner), day, recipe, ingredients, snooze meal for an amount of time 	<p>Groceries</p> <ul style="list-style-type: none"> ➤ Add item ➤ Remove item ➤ Recommend items ➤ Prices at nearby stores
	<ul style="list-style-type: none"> ➤ Edit meal plan screen (add/remove recipes, edit days meals are planned for) 	

FreshPick will be a mobile app based on the following insights:

1. Accessibility: A mobile app can be accessed from anywhere on a smartphone, making it more convenient for users to manage their food inventory, recipes, and meal plans on-the-go
2. Camera Integration: Many smartphones have built-in cameras that can be used to scan barcodes and quickly add items to your inventory. This functionality would not be possible on a web app
3. Push Notifications: A mobile app can send push notifications to remind users when food items are about to expire or when it's time to use a certain ingredient in a recipe. This type of real-time notification would not be possible on a web app
4. Touch Interface: A mobile app can take advantage of a smartphone's touch interface, making it more intuitive and user-friendly. For example, users could easily swipe to delete items from their inventory or scroll through recipes with a flick of their finger.

Roadmap

v1 - Inventory Manager

Version 1 will be an inventory manager for the user's fridge and pantry. Using an optical tracking system, it will allow the user to see everything and keep track of everything in their fridge and pantry

Main features (physical)

- Smart camera that detects what foods are present
- Gimbal mount to move the view to see all corners of the space

Main features (app)

- Inventory list
- Grocery list
- Date tracking (date of purchase, expiration if entered)
- Shelf-by shelf live view with motion control
- Reminders to put things back in the fridge or add to shopping list

vNext - Meal Planner

The next version will integrate a re-sizeable scale into the shelves of the refrigerator, freezer, and pantry, so that the weight of each food item can be measured. This will improve inventory tracking and allow users to see if they have enough of or need to buy more of an ingredient they plan to use in a recipe.

Added Main Features (physical)

- Scale that detects the quantity of food

Added Main Features (app)

- Recipe suggestions based on expiring ingredients
- Weekly auto meal planning with customization
- Grocery list creation based on what is missing or has low quantity in inventory

vLongterm - Tiny Chef

The long term goal is to offer a grocery store to plate service. This version will use our smart food measurement technology to help make cooking easier for people with low culinary expertise. The addition of a camera in the kitchen space will allow a virtual assistant to guide home cooks through a recipe and provide feedback and reminders throughout the process.

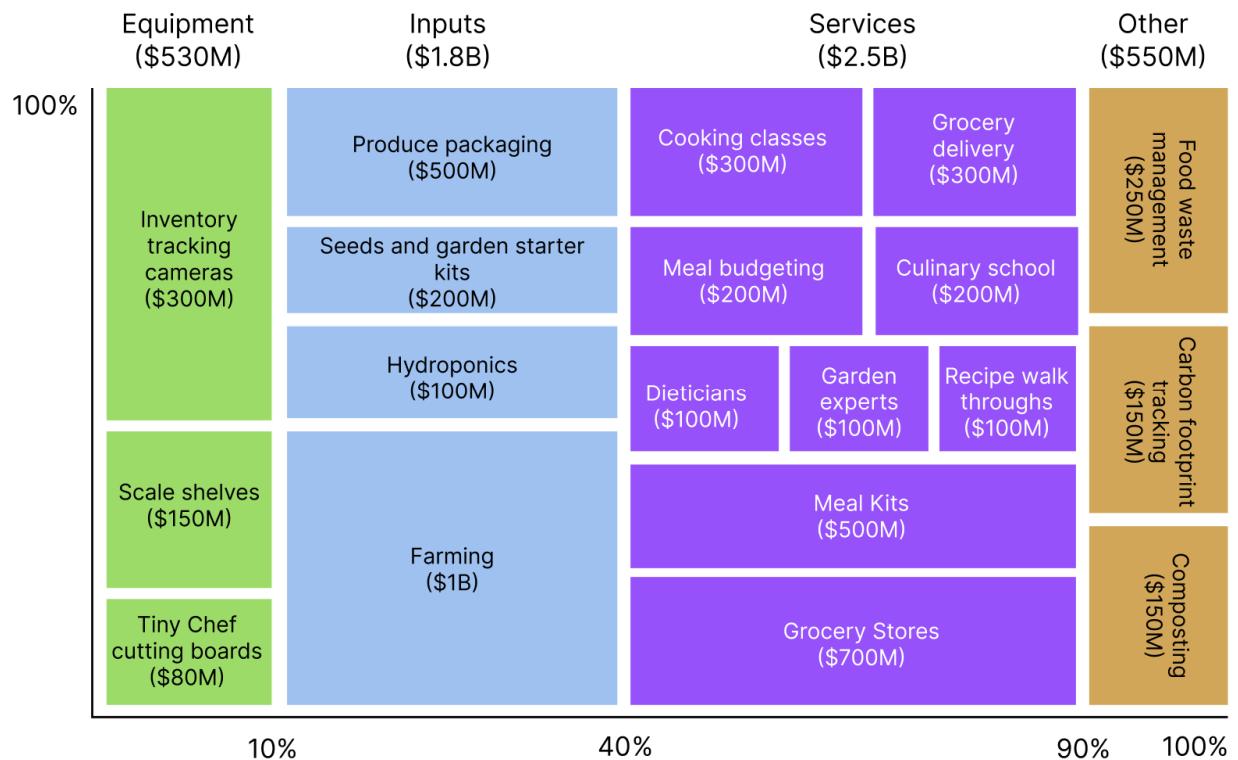
Added Main Features (physical)

- Smart cutting boards and cooking mats with weight sensor
- Kitchen camera for cooking assist

Added Main Features (app)

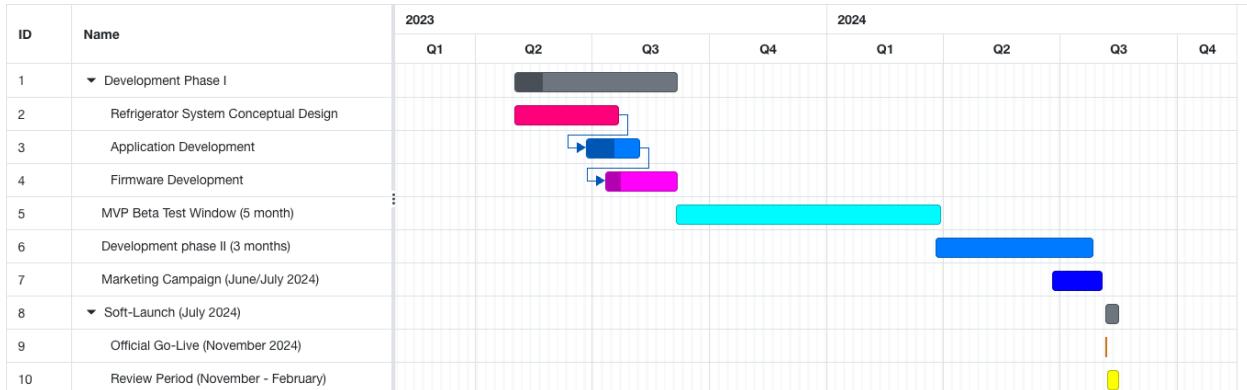
- Virtual sous chef Remy (alexa-style voice assistant)
- Cooking tips and tricks as you go
- Rate your recipes over time

Portfolio Growth Opportunities



Milestones / Timing

- Project Timeline Dates
 - Development Phase I (1 year)
 - Beta Test Window (3 month)
 - Development phase II (6 months)
 - Soft-Launch (September 2024)
 - Marketing Campaign (August 2024)
 - Official Go-Live (November 2024)
 - Review Period (November - February)



Go-to-Market Plan:

Year 1:

In the first year, the focus is on building awareness and driving initial sales.

Marketing and Promotion: Conduct thorough market research to identify the most effective digital marketing channels and understand the preferences of the target audience. Develop a comprehensive content marketing strategy that includes blog posts, videos, and engaging social media content. Implement social media advertising campaigns to raise awareness and drive traffic to the FreshPick website. Collaborate with relevant influencers and food bloggers to promote FreshPick through sponsored content and reviews, leveraging their existing audience and credibility.

Distribution Channels: Establish partnerships with online retailers, sustainable living marketplaces, and kitchenware stores to stock and sell FreshPick. Launch an e-commerce platform to enable direct-to-consumer sales, providing convenience and accessibility to customers. Implement a robust inventory management system to ensure efficient order fulfillment and timely deliveries.

Product Launch: Plan and execute an impactful product launch event or campaign, incorporating both online and offline elements. Leverage press releases and media outreach to secure coverage in relevant publications and online platforms. Offer limited-time promotions or discounts for early adopters to generate excitement and encourage initial sales. Collect customer feedback during the launch phase to identify any potential product improvements or enhancements.

Year 2:

In the second year, the focus is on expanding customer base, fostering loyalty, and continuous improvement.

Partnerships and Collaborations: Identify potential partnerships with recipe apps, meal kit services, or sustainable food organizations that align with FreshPick's target market. Collaborate with these partners to cross-promote FreshPick and offer exclusive deals or promotions to their respective user bases. Engage with influential food bloggers and content creators to feature FreshPick in their recipes, videos, or sponsored content, leveraging their reach and influence.

Customer Engagement and Loyalty: Establish a dedicated customer support team to handle inquiries, troubleshooting, and provide personalized assistance to customers. Develop a customer loyalty program that rewards repeat purchases and referrals, fostering long-term customer relationships. Implement regular communication with customers through email newsletters or a mobile app, sharing cooking tips, recipes, and updates on new features or enhancements. Encourage user-generated content on social media platforms, featuring customer success stories and creative recipe ideas, to build a community around FreshPick.

Continuous Improvement: Continuously gather and analyze customer feedback through surveys, reviews, and support interactions. Use this feedback to drive product improvements and enhancements. Regularly release software updates to enhance functionality, address bugs, and introduce new features based on customer needs and market trends. Stay informed about emerging technologies in the food and sustainability sectors to remain competitive and identify opportunities for growth and expansion.

By following this timeline and focusing on key areas such as marketing, distribution, partnerships, customer engagement, and continuous improvement, FreshPick can successfully execute its go-to-market strategy, acquire a loyal customer base, and establish a strong foundation for future growth and success.

Metrics

- Monthly Recurring Revenue (MRR): increase total MMR by X% annually (FreshPick's North Star)

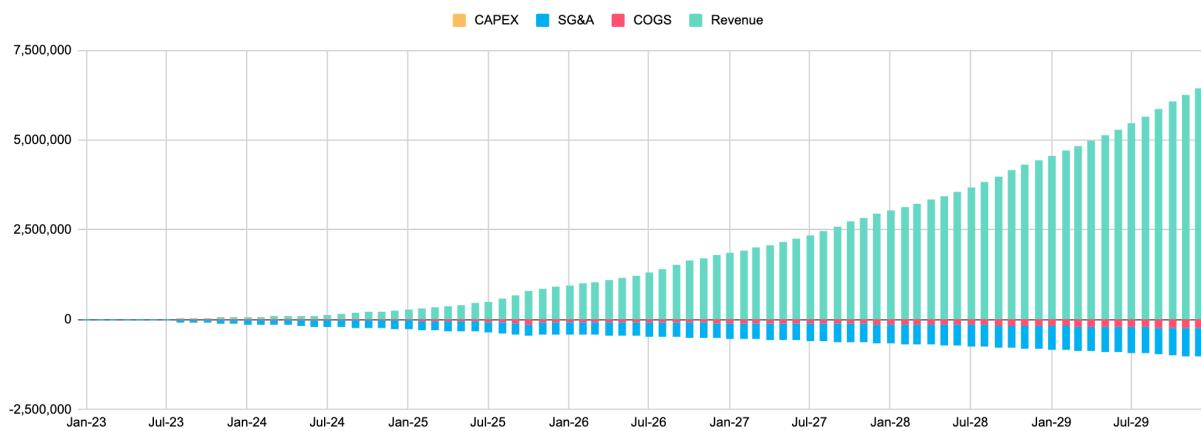
- Churn Rate/Customer Retention: understand churn for paid subscribers. Are they downgrading to a free plan or deleting account (and why?)
- CAC: determine initial CAC to launch, and run experiments to lower CAC.
- NPS: Net Promoter Score: important to Freshpick. Use NPS to find more information about target audiences, and target high-performing audiences with additional marketing efforts.
- Active Users: understand usage and consistency of active users → daily, weekly or bi-weekly?
- Funnel Conversion Rate: who is converting from freemium to paid?

Projected Costs

Engineering Costs

We plan to develop FreshPick in two phases. Phase 1 will begin in Q2-2023 and be completed in Q3-2023. Phase 2 will begin in Q3-2023 and the FreshPick MVP will be completed by Q1-2024. The greatest expenses are expected to occur when manufacturing the hardware to support our application, developing the application, and developing the technology to connect the two.

Monthly Revenue vs Expenses | 5-Year Projection



- https://docs.google.com/spreadsheets/d/13DjvyZIFD5LBmDLaB_0bF0LBGMgclTfMwKAWxYGqL0/edit#gid=128996941

Our development team is composed of skilled professionals who will bring the FreshPick mobile app to life. With expertise in mobile app development, user interface (UI) and user experience (UX) design, backend infrastructure, quality assurance (QA), and project management, our team is dedicated to creating a top-notch app that meets the needs of our users.

Based on these roles, a small development team for FreshPick would consist of:

- 1 Project Manager
- 1 UI/UX Designer
- 2 Mobile App Developers (1 iOS and 1 Android)
- 1 Backend Developer
- 1 QA/Tester

Engineer Weeks: Estimate between 35 engineer weeks for the FreshPick project, considering all development stages, such as planning, design, development, testing, deployment and initial maintenance. This estimate is based on the project's specific requirements and timeline.

Cost of Storage and Compute Resources: Approximate storage costs range from \$50 to \$500+ per month, depending on the volume of user data and images. Compute resources are expected to cost \$350 per month to withstand an onboarding of about 10,000 users in the first year, depending on expected usage and computational requirements. Final costs will be determined by the chosen cloud service provider and actual usage.

Marketing / other Costs

Marketing Costs Statement for 6-Month Launch Campaign:

Our marketing strategy for the FreshPick launch campaign aims to allocate a budget of \$1500 per month beginning in phase II development and increase our marketing budget to \$5,000 per month post our official launch to various marketing outlets. The goal is to create awareness, drive user acquisition, and promote engagement with our product. Additionally, we plan to incrementally increase the marketing budget by 10% every three months to optimize campaign performance and capitalize on momentum.

Estimated Marketing Budget Allocation:

- Month 1: \$5,000
- Month 2: \$5,000
- Month 3: \$5,000

Month 4: \$5,500 (10% increase from previous month)

Month 5: \$5,500

Month 6: \$6,050 (10% increase from previous month)

Marketing Channels and Activities:

To maximize reach and engagement, we will utilize a combination of digital marketing channels, social media platforms, content marketing, and targeted advertising. The specific breakdown of the budget across these channels may vary based on campaign performance and audience response. Our marketing efforts will include:

Digital Advertising: Allocating funds for targeted online ads through platforms like Google Ads, social media advertising (Facebook, Instagram, Twitter), and display networks to generate visibility and drive user acquisition.

Social Media Marketing: Investing in organic and paid social media campaigns to build brand awareness, engage with the target audience, and promote app downloads. This includes creating engaging content, influencer collaborations, and community management.

Content Marketing: Developing high-quality blog posts, articles, and video content to showcase the value proposition of FreshPick, provide useful cooking tips, and attract organic traffic through search engine optimization (SEO).

App Store Optimization (ASO): Implementing ASO strategies to optimize the app's visibility and increase organic downloads in relevant app stores, such as the Apple App Store and Google Play Store.

Email Marketing: Building and nurturing a subscriber base to engage with users through personalized email campaigns, newsletters, and promotions to encourage app usage and retention.

Public Relations: Collaborating with relevant media outlets, bloggers, and influencers to generate press coverage, product reviews, and endorsements, increasing brand credibility and reaching a wider audience.

Operational Needs

Direct Customer Support: Establish a customer support team or utilize a chatbot system to assist customers with inquiries, troubleshooting, and technical support. Provide multiple communication channels such as phone, email, and live chat for

customers to reach out easily.

User Documentation: Create comprehensive user manuals and guides that explain the installation, setup, and operation of the FreshPick refrigerator attachment. Include troubleshooting steps and frequently asked questions to address common issues.

Software Updates: Regularly release software updates to improve functionality, address bugs, and introduce new features. Implement an automated update system or provide clear instructions for customers to update their device and keep it running smoothly.

Training and Education: Offer educational resources, such as video tutorials and blog posts, to help users optimize their experience with FreshPick. Provide tips on meal planning, utilizing leftovers, and reducing food waste to empower customers in their cooking endeavors.

Feedback Collection: Establish channels for customers to provide feedback and suggestions. Encourage customers to share their experiences, report any issues, and offer ideas for improvement. Use this feedback to enhance the product and address customer needs.

Warranty and Repairs: Develop a warranty policy that covers manufacturing defects and malfunctions. Provide clear instructions for customers to request repairs or replacements, either through authorized service centers or by shipping the device for servicing.

By implementing these measures, FreshPick can provide ongoing customer service and operational support, ensuring customer satisfaction, and fostering a loyal user base.

Risks

Risk	Description	Mitigation strategies
Privacy	Data privacy is a big concern, particularly as it relates to the camera and to the tracking of food usage and consumption	<ul style="list-style-type: none">• Storing data locally - would not be able to be backed up or shared amongst devices but would not be accessible by any nefarious

	<p>patterns. The user should feel confident knowing that their data is theirs only and does not get shared with anyone else. They should trust in the security of the system and the system should not be easily breached.</p>	<ul style="list-style-type: none"> party • Separating user identification data from food data (or simply not collecting user information -do we need this?) • Partnering with trusted companies (ring, blynk, etc) to create a robust secure interface • Specifically promising to not partner with companies (i.e. amazon) that will use the data to provide ads or curated content based on consumption habits
Legal concerns around food safety	<p>Any claims or advice given to consumers in the safety of storing or consuming their food is subject to legal scrutiny.</p>	<p>No absolute claims can be made that say that a food is safe to eat. While guidelines can be provided, it must be made explicitly clear to the user that these are subjective and it is their responsibility to make the final decision</p>
Patent concerns	<p>Due to the fact that the system features both a physical product as well as a software component, it will be difficult to patent the entire system. Software in general is extremely difficult to patent and is often still easy to recreate retroactively.</p>	<p>An extremely thorough patent covering the hardware portion of the device will need to stand alone while also incorporating the software elements. Algorithms created to determine recognition or recommendations should be kept as trade secrets.</p>
Food safety standards	<p>Since the hardware portion of the product is going to come into direct contact with food, it will need to be placed under a higher standard of materials and manufacturing methods</p>	<p>All materials used should be made of food-grade materials. They should be easily disinfected and wherever possible dishwasher safe. They should all be clearly labeled on how to use and store (microwave safe as well) and there should be a way to let the user know when it is time for a</p>

		replacement part (chips, cracks, etc)
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International

Cultural and Culinary Differences: Food habits, cooking styles, and ingredient availability vary across cultures and countries. FreshPick's effectiveness relies on monitoring and managing food items that are typically found in Western-style kitchens. It may not seamlessly adapt to international cuisines or accommodate the diverse range of ingredients and cooking practices worldwide.

Infrastructure and Market Readiness: The success of a product like FreshPick heavily relies on the availability and affordability of modern refrigeration systems in households. In some regions, especially in developing countries, access to reliable electricity or widespread adoption of refrigerators might be limited. This could hinder the widespread adoption and market readiness for a product like FreshPick.

Localization and Language Barriers: To successfully penetrate international markets, localization is crucial. Adapting the device's software, user interface, and notifications to different languages, units of measurement, and regional food labeling systems can be a complex and costly process. Language barriers and cultural nuances may pose challenges in effectively communicating the value proposition of FreshPick and building customer trust and adoption.

Team Members

We are collectively working on this project and decided on delegating tasks based on the need.

- Corinne Brady, corinnebrady2024@u.northwestern.edu, Role: Project Manager
- Jordyn Brown, jordynbrown2023@u.northwestern.edu, Role: Subject Matter Expert
- Christie Bok, christinebok2023@u.northwestern.edu, Role: Quality Assurance Specialist
- Ana Carvallo, anacarvallo2024@u.northwestern.edu, Role: Team Lead
- Lindsay Lipschultz, lindsaylipschultz2022@u.northwestern.edu, Role: Product

Design Specialist

- Ritika Ramesh, ritikaramesh2024@u.northwestern.edu, Role: Technical Specialist

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- Teacher's Assistant: Reza Kumara for his feedback and guidance throughout the project.

THANK YOU!

Customer Research Data Appendices

Appendix 1: Context:

Households are the largest contributors to food waste, with US households wasting an estimated 76 billion pounds of food annually. Approximately 40-50% of all food waste, including 51 to 63% of seafood waste, happens at a consumer level. Fresh fruits and vegetables accounts for the largest losses at a consumer level, followed by dairy, meat, and seafood. Food spoilage at home is due to improper storage, lack of visibility in refrigerators, partially used ingredients, and misjudged food needs. The remaining third of household food waste is due to people cooking or serving too much food. Date label confusion is also a major contributor, with an estimated 80% of Americans prematurely discarding food due to confusion over the meaning of date labels. Overbuying and poor planning, including unplanned restaurant meals or food delivery, can also lead to food at home going bad before it can be used.

Appendix 2: Interview:

It might be helpful to conduct research and answer some of these questions:

-How do you decide what groceries to buy?

- How do you store your produce?
- What produce do you have right now, and what are you planning to do about it?
- Walk me through your current shopping, storing, and meal-prepping experience. What does your ideal experience look like?
- What are some of the reasons why you think food waste is a problem, and why do you think it's important to address this issue?
- What are some of the challenges you face in reducing food waste daily, and how do you try to overcome them?
- How do you think your lifestyle and habits contribute to food waste, and what changes could you make to reduce your impact on the environment/footprint?
- When was the last time you had to throw away food waste? Could you walk us through it?
- How do you feel about your own efforts to reduce food waste, and what motivates you to continue working on this issue?
- Can you describe a specific scenario where you struggled with food purchasing, portioning, or waste management?

Additionally, it might also be useful to collect quantitative data and conduct a survey to understand consumer habits and behavior, particularly in relation to food waste:

- How often do you go grocery shopping?
- How often do you check the expiration dates on a food product in your fridge?
- How often do you throw away food that has gone bad?
- How often do you plan meals in advance?
- How often do you use recipes to guide your meal prep?
- How important is it to you to reduce food waste in your household?
- How likely are you to use a product that helps you track and utilize the food in your fridge?

Note: An important factor that plays into conducting research is to make sure you have a diverse representation. This includes single people in their 20s and 30s struggling to use their food before expiration. They do not necessarily need to be conscious individuals who have already adapted workarounds into their daily life. We hope to select individuals through in-person recruitment at grocery stores or apartment buildings with a high density of single young adults.