FridgeHack





Discover the recipes in your fridge whilst reducing your carbon footprint…

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Summary

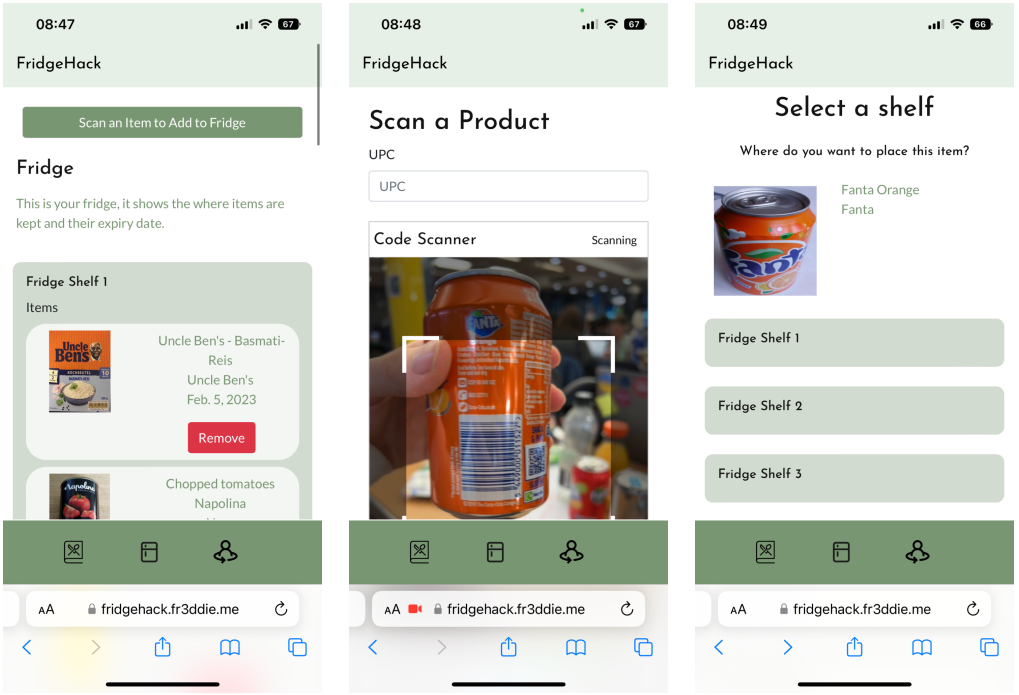
FridgeHack is your private chef, using intelligent algorithms to generate a whole new range of flavours. The system is sustainable in that expired products within your fridge are prioritised as needing to be used. The system then generates a bespoke meal recipe just for those ingredients selected.

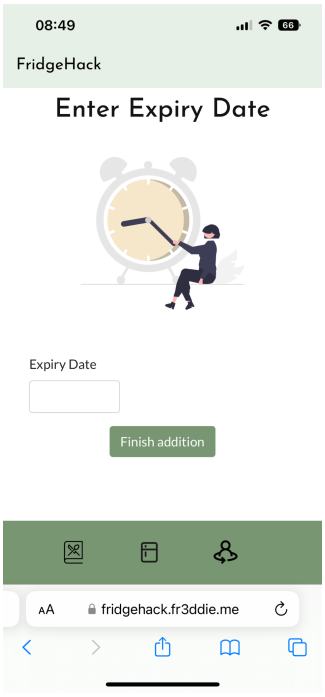
It generates a picture of the recipe to help illustrate the potential product and provides a written step-by-step recipe that can be saved to your curated cookbook within the app.

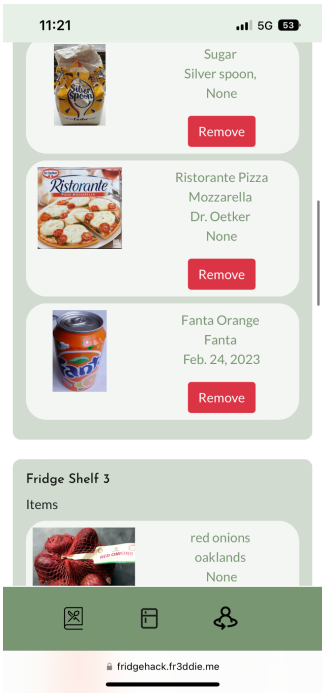
This could potentially save you hundreds of pounds a year and allows you to explore new recipes whilst lowering your carbon footprint by reducing food waste.

App Workflows

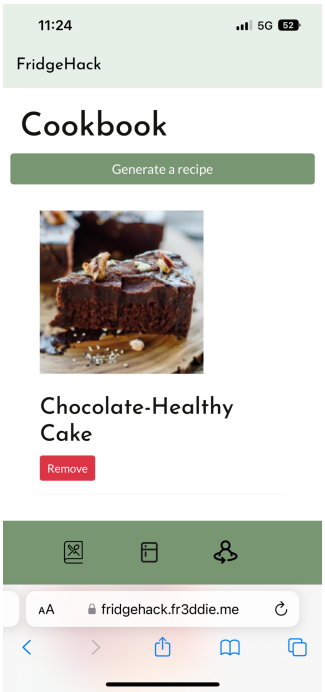
Scanning an item to input to your virtual fridge

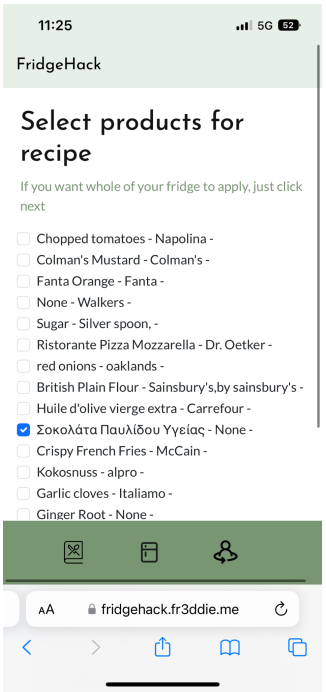


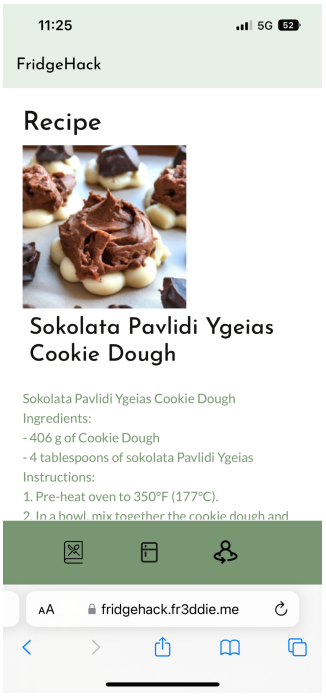


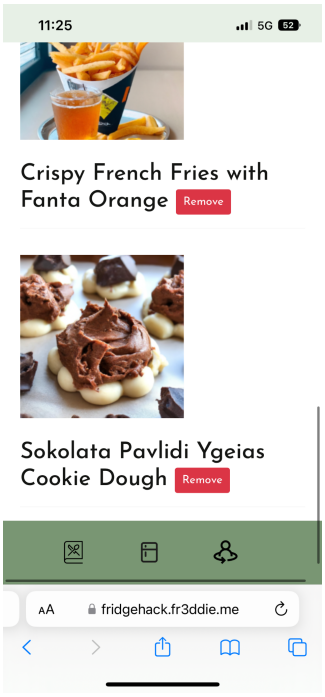


Generating a recipe based on close to expiry items (or items of choosing)

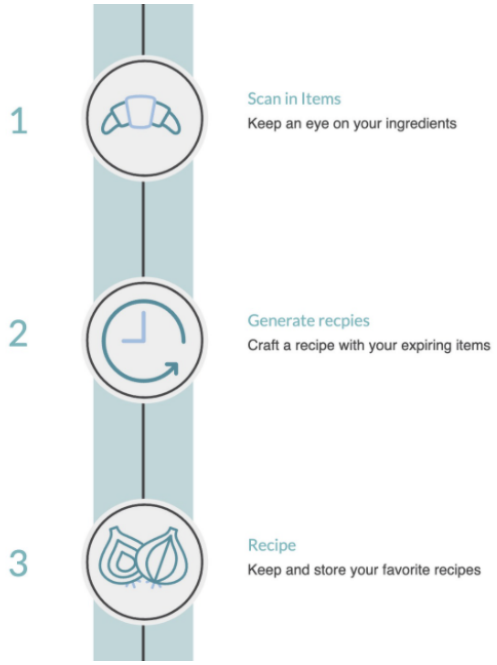


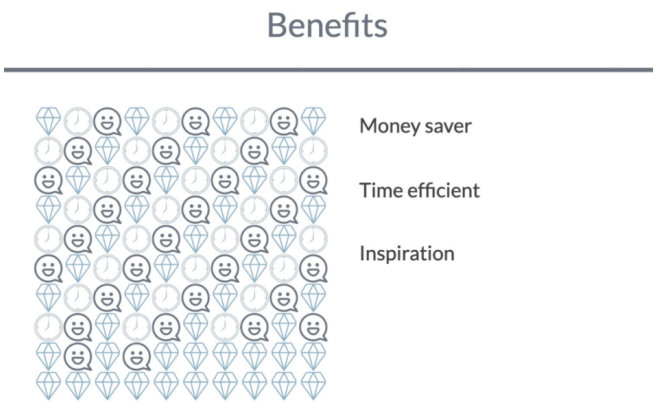


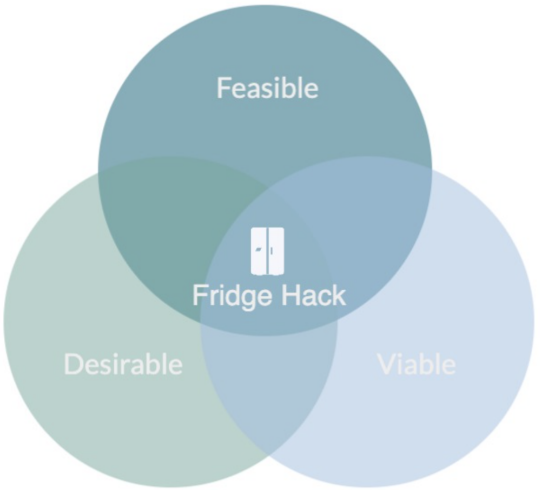

11:25
5G
52
FridgeHack
Recipe
Sokolata Pavlidi Ygeias Cookie Dough
Sokolata Pavlidi Ygeias Cookie Dough
Ingredients:
- 406 g of Cookie Dough
- 4 tablespoons of sokolata Pavlidi Ygeias
Instructions:
1. Pre-heat oven to 350°F (177°C).
2. In a bowl, mix together the cookie dough and
AA
fridgehack.fr3ddie.me


11:25
5G
52
Crispy French Fries with Fanta Orange
Remove
Sokolata Pavlidi Ygeias Cookie Dough
Remove
AA
fridgehack.fr3ddie.me

Value proposition



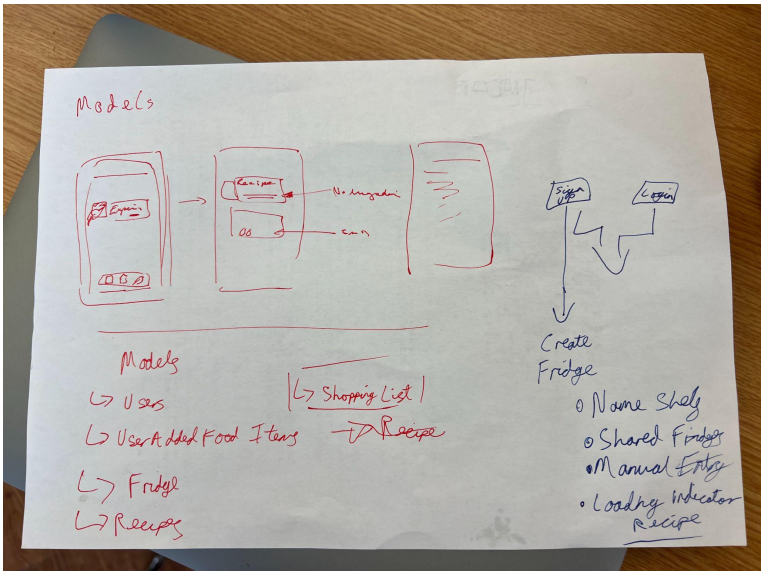




Setting out the models for the project

As the project was designed in Django, it made sense to first discuss the models (OOP) that would be used within the project.

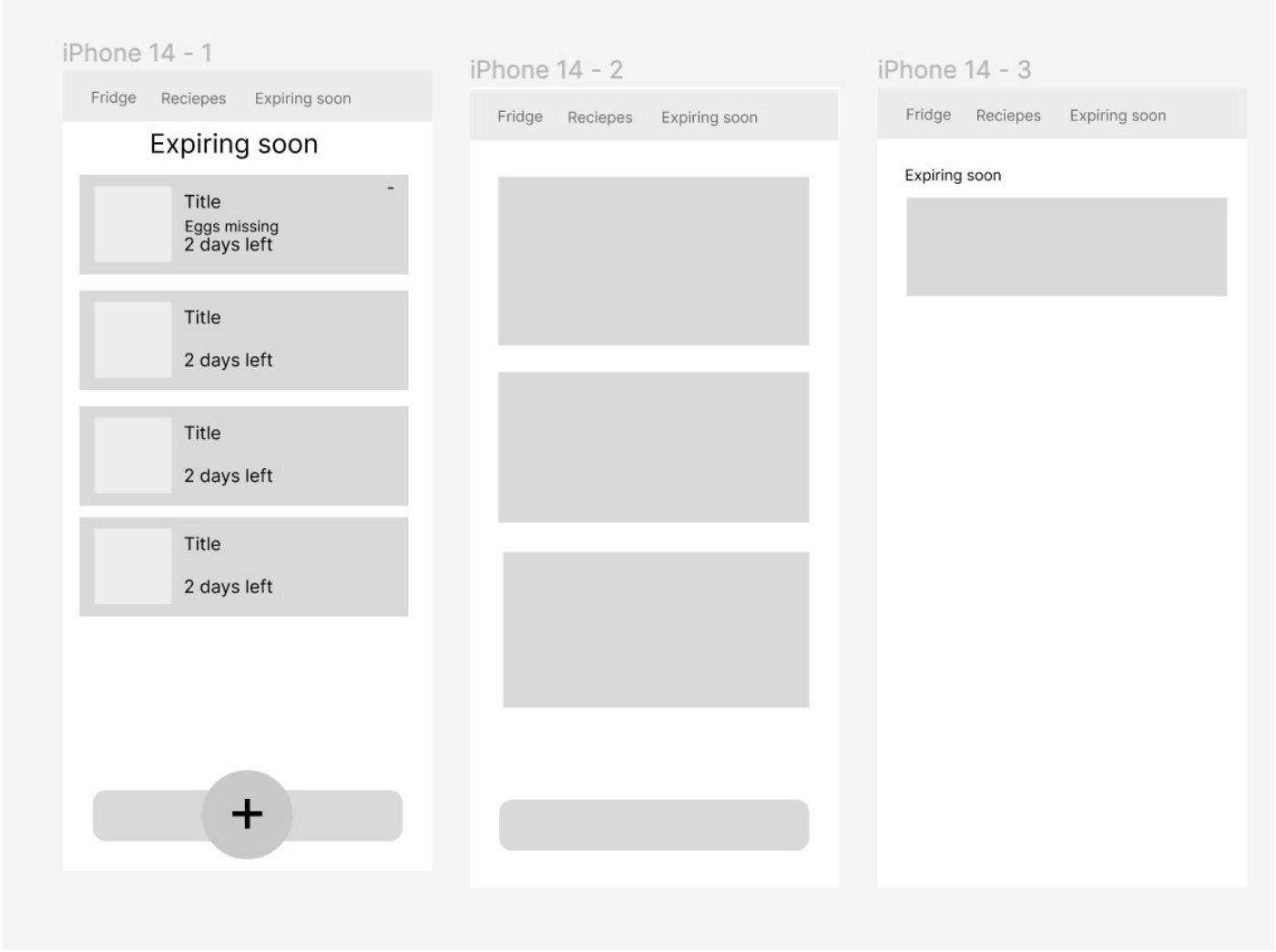
We drew out a brief diagram and model list to illustrate our thoughts:



- Fridge — The fridge is the users individual container for all their food items, consisting of individual shelves
  - owner — User that owns the fridge
  - __str__ — A method for the admin interface to debug
- Shelf — The shelf sits within the fridge to help organise the app for the user
  - fridge — The parent fridge object
  - freezer — Whether the shelf is a fridge or freezer, True if freezer
  - number — The shelf number within the fridge for easier readability
  - __str__ — A representation of the shelf for debugging
  - frozen
- UserAddedFoodItems — Each individual item that a user has scanned, data is collected from open food facts via UPC
  - owner — User that owns the item
  - on_shelf — The specific shelf object
  - brand — The specific product brand from open food facts
  - productName — The specific product name from open food facts
  - weight — The specific product weight from open food facts
  - servingWeight — The specific serving product weight from open food facts
  - labels — Labels from open food facts
  - imageURL — Image url to open food facts with an image of the photo
  - expiry_date — Expiry date entered by the user
- Recipe — Recipe data generated by GPT3
  - title — Recipe title extracted using specific prompting
  - imageURL — DALL-E image generated URL
  - recipe — Actual GPT3 detail
  - image_field — Image (stored on server) from DALL-E using title
- UserProfile — Unused
  - author
- FavouriteRecipes — Linking table for the users favourite recipes
  - author — User that likes the recipe
  - recipe — The favourited recipe

The above shows the final structure.

Wireframes


iPhone 14 - 1
Fridge
Reciepes
Expiring soon
Expiring soon
Title
Eggs missing
2 days left
Title
2 days left
Title
2 days left
Title
2 days left
iPhone 14 - 2
Fridge
Reciepes
Expiring soon
iPhone 14 - 3
Fridge
Reciepes
Expiring soon
Expiring soon

Impact of the project

Every week, food wasted from a single UK family contributes an estimated 23.3 kg of carbon emissions. [1 & 2] Food waste amounts for nearly 15% of UK families' carbon footprints, costs the average UK household £14 per week. [3] Reducing food waste could have a dramatic impact on both the planet and your wallet.

Using food that is about to expire

When food gets near its expiration date the program will automatically send you an email. The email will include some recipe ideas to use the expiring ingredients. Hence, allowing the user to drastically minimise their food waste, saving more and in turn, reducing their carbon footprint.

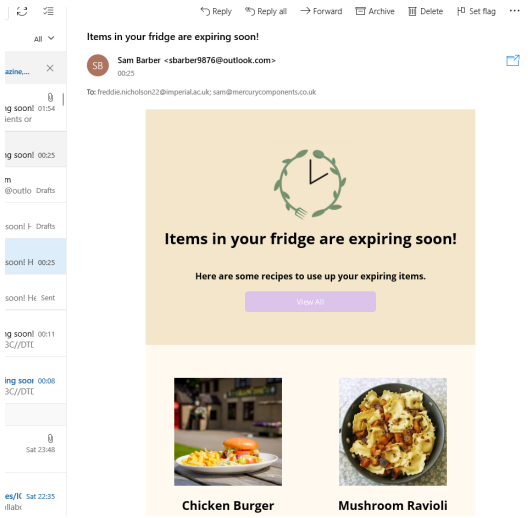


Figure 1 [An example of an email sent to a user]

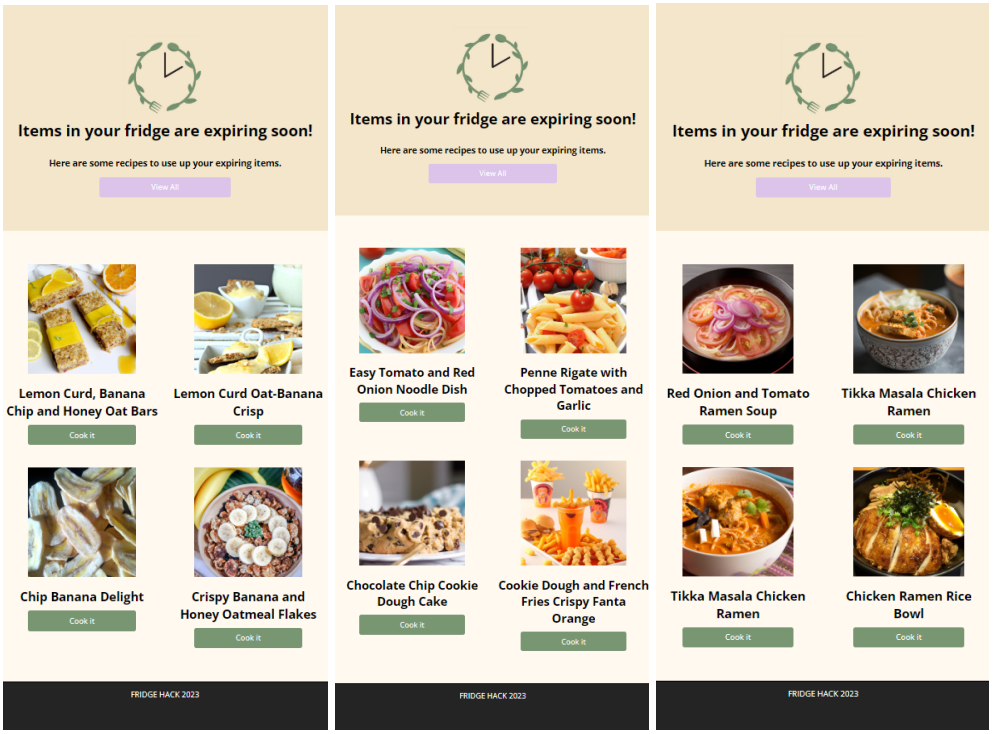
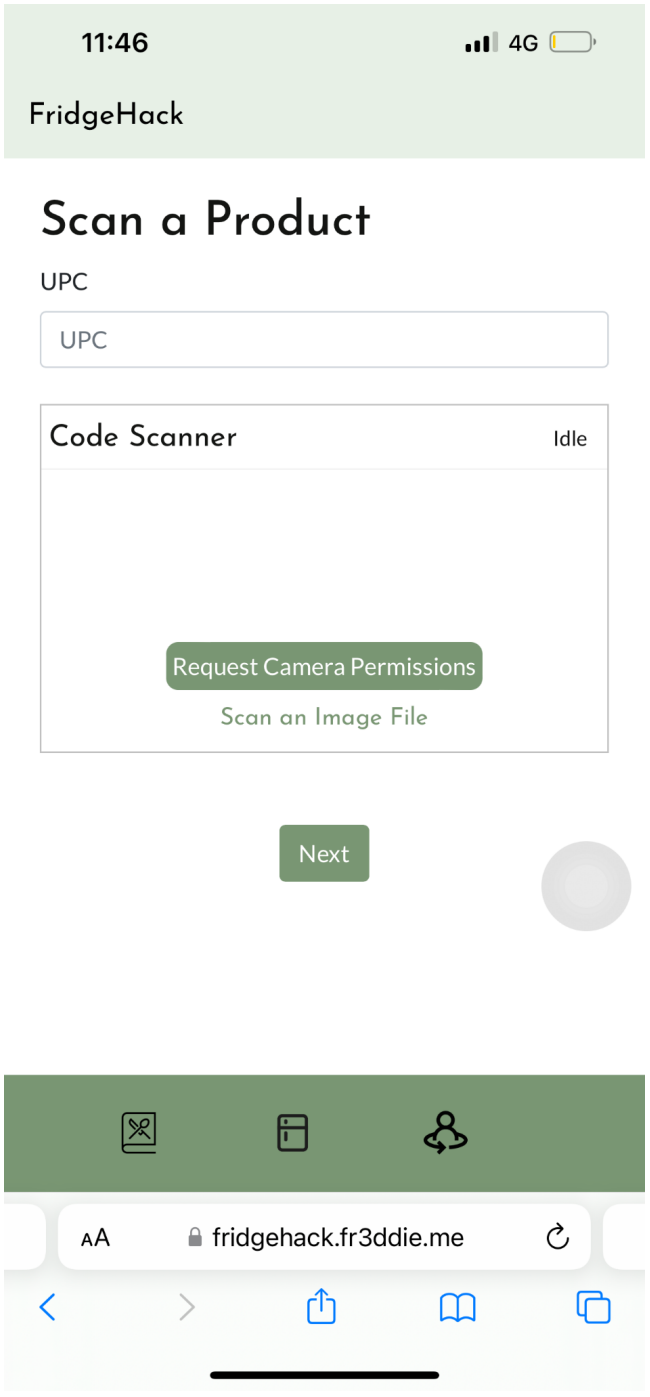
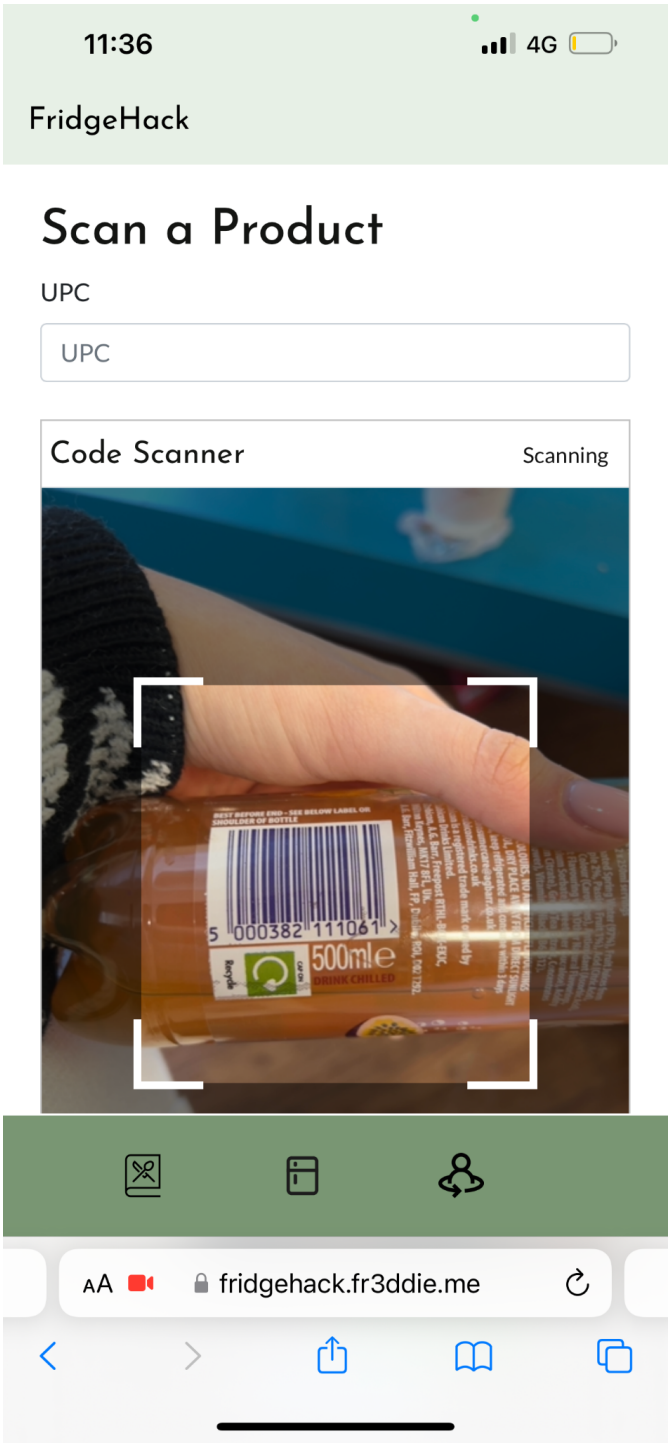


Figure 2 [Additional generated email recipes]

Barcode scanning





Example generated recipes and images

Tikka Masala Chicken Ramen

Tikka Masala Chicken Ramen
Ingredients:
- 350g Soupe Ramen
- 750g Red onions
- 400g Chopped tomatoes
- 165g Tikka Masala Curry Paste
- 330g Filet de poulet x 2
- 1000g Basmati Reis
- Pak Choi

Instructions:
1. Preheat oven to 220°C.
2. Slice red onions into thin strips and spread out on baking tray. Place in oven and roast for 15 minutes, stirring occasionally.
3. Meanwhile, heat a large saucepan over medium heat and add tikka masala curry paste. Cook for 1 minute, stirring often.
4. Add chopped tomatoes, stir and cook for another 2 minutes.
5. Add chicken fillets and cook for 5 minutes or until cooked through.
6. Add roasted onions, soupe ramen, and 500ml water and bring to a simmer.
7. Simmer for 10 minutes.
8. Add basmati rice and stir to combine.
9. Simmer for a further 10 minutes or until the rice is cooked through.
10. Add pak choi and cook for a further 2 minutes.

Penne Rigate with Chopped Tomatoes and Garlic

Penne Rigate with Chopped Tomatoes and Garlic
Ingredients:
- 400 g of chopped tomatoes
- 6-7 garlic cloves, minced
- 750 g of red onions, diced
- 500 g of penne rigate n.73
- Salt and pepper to taste
- Extra virgin olive oil for sautéing

Instructions:
1. Heat a large skillet over medium-high heat and add a few tablespoons of olive oil.
2. Add the diced red onions and sauté until they begin to soften, about 5 minutes.
3. Add the minced garlic and sauté for another minute or two.
4. Add the chopped tomatoes and season with salt and pepper.
5. Reduce the heat to low and simmer for 10 minutes.
6. Meanwhile, cook the penne rigate n.73 according to package instructions.
7. Drain the cooked pasta and add it to the tomato sauce.
8. Stir to combine and cook until the sauce is bubbly and the pasta is cooked through, about 5 minutes.
9. Serve hot. Enjoy!

Chicken Ramen Rice Bowl

Chicken Ramen Rice Bowl
Ingredients:
- 350 g of Soupe Ramen
- 750 g of red onions (sliced)
- 400 g of Chopped tomatoes
- 330 g of Filet de poulet x 2 (cut into cubes)
- 1000 g of Basmati Reis
- Pak choi (sliced)

Instructions:
1. Heat a large pot over medium heat.
2. Add the red onions and sauté until they are soft and lightly browned.
3. Add the chopped tomatoes and stir to combine.
4. Add the chicken cubes and cook until they are lightly browned and cooked through.
5. Add the soupe ramen and stir to combine.
6. Add the basmati rice and stir to combine.
7. Add the pak choi and stir to combine.
8. Bring the mixture to a boil, reduce the heat to low and simmer for 15-20 minutes or until the rice is cooked through.
9. Serve in bowls and enjoy!

AI and API Implementation

Open Food Facts API provided us with access to a vast variety of information about a product by executing a UPC (barcode) search. By making use of this and a camera barcode scanner, we are able to offer our users the opportunity to add products to their “virtual fridge” within a few seconds. Open Food Facts API not only returns the ‘product name’, but also returns the ‘brand name’, and even provides a photo of the product (when available), allowing our users to remind themselves of the state of their fridge from anywhere.

In order to help our users make the most of what’s already in their fridge, we decided to implement OpenAI’s GPT-3 ‘Davinci’ model to generate recipes using existing items. The model takes as input a simple prompt, such as: “Come up with a recipe including tomatoes, cucumbers and feta cheese.”, and come up with a concise recipe for a greek salad. But to further tempt our users to try these recipes, we had OpenAI’s Image Generation model generate an image with the prompt being the title of the recipe it just suggested. The recipe and the image preview of it both show up for the user on a single page, at which point the user can favourite it and save it for later.

Appendix:

[1] 23.3 kg of carbon per family per week from food waste
https://www.bbc.com/future/article/20200224-how-cutting-your-food-waste-can-help-the-climate#:~:text=They%20discovered%20that%20each%20family,23.3kg%20of%20carbon%20emissions.

[2] 8.1 tons of carbon emissions per household per year
https://heatable.co.uk/boiler-advice/average-carbon-footprint#:~:text=In%20short%20the%20report%20makes,current%20average%20of%208.1%20tonnes.

[3] Food waste costs the average UK family £728 per year
https://www.theecoexperts.co.uk/home-hub/food-waste-facts-and-statistics#:~:text=Average%20food%20waste%20per%20household%20per%20day%20in%20the%20UK&text=This%20adds%20up%20to%20eight,adds%20up%20to%20%C2%A3728.