

# HCI Project 2: Improving Dining Out for Individuals Living with Severe Allergies

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Video Walkthrough of the final prototype: <https://youtu.be/4rgvT2FVjPo>

## Problem Space

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Food allergies affect more than 32 million Americans each year [1]. Reactions to food allergies can range in severity, and the number of individuals with a severe food allergy is on the rise [1]. For those who have severe reactions to allergen exposure, eating out is not just a social experience, it's a serious medical risk. "Each year in the U.S., 200,000 people require emergency medical care for allergic reactions to food" [1]. Even with growing consideration in the food industry to consider dietary restrictions such as gluten-free and vegan options, there is still a significant hurdle for those with severe allergies to overcome when eating in an uncontrolled environment. Our project focuses on this community of individuals who suffer from severe food allergies and aims to find a solution that lowers the barrier preventing members of this group from feeling safe in daily interactions.

### Inclusive Design

In a recent talk, Kat Holmes discusses how it is the responsibility of designers to minimize mismatches between a person's body and the designed interface/technology [4]. The current restaurant search process creates a significant mismatch between the needs of individuals with allergies and the current available technologies. Our solution aims to use inclusive design principles; in particular, by collaborating at each iteration step with a **co-designer** who has a severe allergy to create a solution that addresses this mismatch.

## User Personas

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To be most effective in helping the community of people living with a severe food allergy, we first reached out to individuals in our circle who we knew had an allergy. Our participants were all allergic to some kind of nut and had medium to high severity, meaning that exposure would likely require them to administer epinephrine (EpiPen) and then seek immediate medical attention.

### Co-designer:

#### *Jane Doe 1*

Allergy: Tree nuts

Allergy Severity: High – Definite anaphylaxis

Allergy Sensitivity: Sensitive to ingestion

Current Occupation: PhD student

Use of Restaurant/Food Search Engines: Medium, frequently wants to eat at restaurants or order take out, but sometimes effort to find safe food hinders efforts

Goals: Order food quickly and safely

## Other Participants:

### *Jane Doe 2*

Allergy: Tree nuts

Allergy Severity: Medium – Potential anaphylaxis

Allergy Sensitivity: Sensitive to ingestion

Current Occupation: Student

Use of Restaurant/Food Search Engines: High, works long hours, so often orders take out

Goals: Order food quickly and safely

### *Jane Doe 3 \*Sibling of individual with severe allergy*

Allergy: Peanuts

Allergy Severity: High – Definite anaphylaxis

Allergy Sensitivity: Sensitive to ingestion and touch

Current Occupation: Data Scientist

Use of Restaurant/Food Search Engines: High, frequently eats at restaurants or orders take out in personal life with sibling. Also handles large lunch catering orders at work due to experience with handling allergies.

Goals: Have a system that improves awareness of allergy information

Notable Comments: Has seen individuals not take precautions against even the most common allergies such as peanuts

We worked with these three individuals to define our problem scope and focus our project into an area where they felt their daily lives would be most directly impacted. Across the board, our participants agreed that one of the biggest hurdles they face is lack of awareness of food allergies and lack of information available to judge how accommodating or safe a new place is to visit. To better understand how someone with a food allergy may choose to interact with the world and gain context for our design process we performed user research.

## Problem Understanding

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### Elicitation Diary

To get more information about our problem space we performed Elicitation Diary interviews with 3 participants who all suffer from severe allergies. The questions asked to prompt the participants for information are listed below:

1. What are difficulties when going out in public that you're concerned with (w/ a severe allergy)?
2. What is the biggest danger/concern of exposure to your allergen?
3. How do you determine if a place is “safe” for you? What is your criteria? How do you judge a place when you are there?
4. What is the process you use to choose a place to eat?
5. How do you select food choices or what to eat? How far removed does something have to be for you to consider it safe? (in a different area of the kitchen, cookware never used with allergen, etc.)
6. What would make you feel more confident about a restaurant?
7. Do you have any thoughts on how things can be improved for you? Are there things that would make your life easier/the experience of “eating out” more accessible and safe to you?

Our goal was to get an understanding of what type of precautions people who have severe allergies take when navigating the world. Because all 3 of our participants had severe food allergies, they naturally focused on the difficulty of eating out. The key struggle for all of them seemed to be lack of awareness and information to help people with severe allergies feel secure when eating a new dish or at a new place.

## **Interview summaries**

We performed explorative interviews with 3 participants. Two participants suffered themselves with severe nut allergies. The third participant is a sibling of an individual with extremely severe nut allergies. Below are the summaries from each interview. To protect the anonymity of the participants we will not provide their interview recordings.

### **Primary Co-designer: Jane Doe 1**

#### **What are difficulties when going out in public that you're concerned with (w/ a severe allergy)?**

- Traveling to other counties is particularly difficult, language barriers prevent communication of allergies, allergies are not accepted in all cultures
- When younger, awareness of allergies was more limited, generally this has gotten better
- There are generally food categories she learns to trust

#### **What is the biggest danger/concern of exposure to your allergen?**

- Allergen can be in the same room but cannot be touched/ingested
- Ingestion results in anaphylaxis
- Touch results in rash/itch/inflammation

#### **How do you determine if a place is “safe” for you? What is your criteria? How to you judge a place when you are there?**

- If at a party, will not eat if people are not being careful with serving utensils
- Avoids curries because they tend to have nuts mixed into spices

#### **What is the process you use to choose a place to eat?**

- Usually uses yelp because tends to have more reviews, looks at cleanliness
- Looks at menu to see how allergen heavy the menu is, do they highlight allergens etc.

#### **How do you select food choices or what to eat? How far removed does something have to be for you to consider it safe? (in a different area of the kitchen, cookware never used with allergen, etc.)**

- Have surfaces been wiped down between use?
- If menu does not have ingredients and/or allergens listed has to place a lot of trust into waiter/waitress – has led to bad experiences when they are not sure or do not think through all components that may have allergens (e.g. garnish)

#### **What would make you feel more confident about a restaurant?**

- Clear allergy indicators
- Level of knowledge of restaurant servers

**Do you have any thoughts on how things can be improved for you? Are there things that would make your life easier/the experience of “eating out” more accessible and safe to you?**

- Still difficult when waiters/waitresses do not know ingredients or allergy friendliness of dishes
- Communication across languages
- General awareness, make it more commonplace
- Someway to analyze food based on images?

### **Jane Doe 2**

**What are difficulties when going out in public that you're concerned with (w/ a severe allergy)?**

- Without ingredient list impossible to know if allergens will show up inside dishes or on garnish, even if main dish is allergen free

**What is the biggest danger/concern of exposure to your allergen?**

- Danger of ingestion

**How do you determine if a place is “safe” for you? What is your criteria? How to you judge a place when you are there?**

- It is ok for allergens to be in the same place, ingestion is primary concern

**What is the process you use to choose a place to eat?**

- Pick food/place already tested, or someone in group is familiar with
- If brand new place, double, triple check with staff

**How do you select food choices or what to eat? How far removed does something have to be for you to consider it safe? (in a different area of the kitchen, cookware never used with allergen, etc.)**

- Listing out ingredients, having symbols to not put all the trust in the wait staff – or make it clear if something has allergen to begin with – include allergens that are not thought of (gluten-free, vegetarian, peanut – what about milk, tree nuts, etc?)

**What would make you feel more confident about a restaurant?**

- More information about things on the menu

**Do you have any thoughts on how things can be improved for you? Are there things that would make your life easier/the experience of “eating out” more accessible and safe to you?**

- a way to plan ahead when going to a new restaurant to make sure there is something that they can eat/ that the kitchen will be able to accommodate
- knows how difficult for the kitchen to deal with, don't want to burden and stress out staff so if this information is available through another platform that would be helpful
- whether restaurant is accommodating/ how they can accommodate, e.g. if parts of the dish are prepared ahead of time that can not be changed
- allow the user to decide what they want to get ahead of time and then be able to order that at the restaurant

### Jane Doe 3

*Jane Doe 3 is the sibling of an individual with a very severe allergy.*

#### **What are difficulties when going out in public that you're concerned with (w/ a severe allergy)?**

- Level of sanitation, possibilities for cross contamination – if there is any possibility they do not go to that restaurant
- In public places, e.g. office buildings, people do not have as much awareness - Has had experience where individuals do not label shared food with ingredients, peanut butter has been left out etc.

#### **What is the biggest danger/concern of exposure to your allergen?**

- Anaphylactic shock due to soy or peanuts

#### **How do you determine if a place is “safe” for you? What is your criteria? How do you judge a place when you are there?**

- Restaurant has to specifically state either on menu or via phone that they prevent cross contamination
- Trial by error has unfortunately been part of her sister’s life, she has been to the hospital a few times as a child

#### **What is the process you use to choose a place to eat?**

- They now generally have a list of cuisines that are more allergy friendly
- Use yelp or google maps to see what is within driving, walking, or delivery distance
- Will pick 2-3 restaurants that look promising from menu and call ahead

#### **How do you select food choices or what to eat? How far removed does something have to be for you to consider it safe? (in a different area of the kitchen, cookware never used with allergen, etc.)**

- Cookware should be separate
- Tables must be wiped down
- Have a script of all allergen questions they must get answers to before going to a restaurant

#### **What would make you feel more confident about a restaurant?**

- Allergy information clearly listed on menu
- Dedicated ratings for dietary restrictions

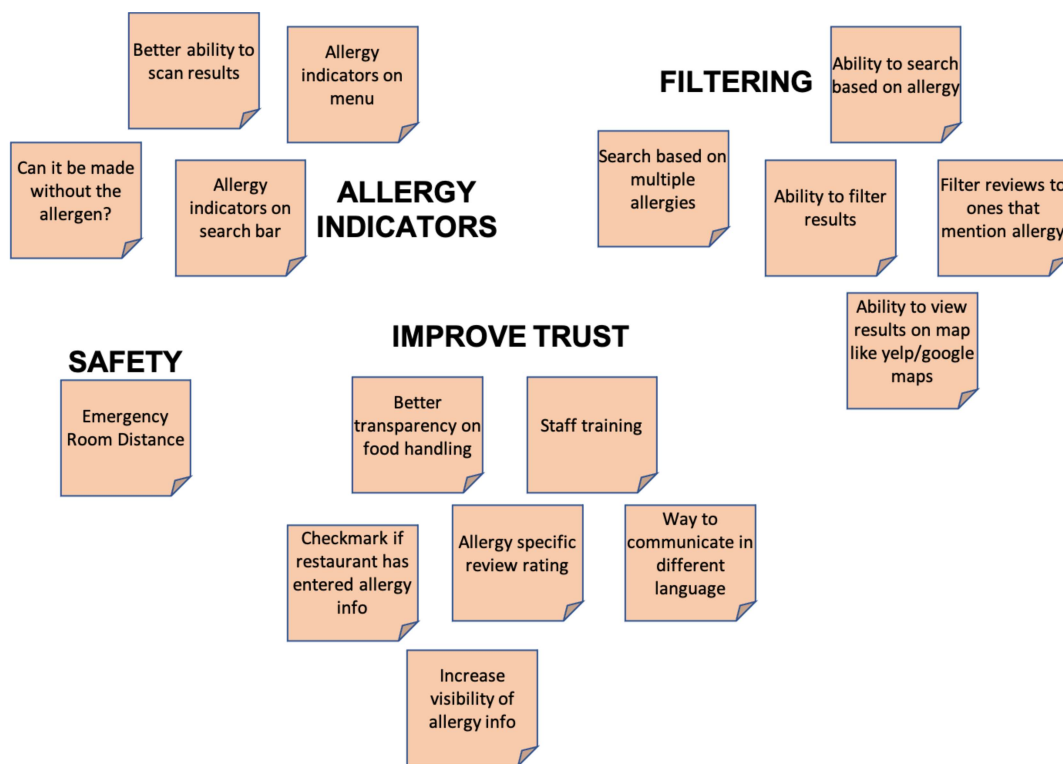
#### **Do you have any thoughts on how things can be improved for you? Are there things that would make your life easier/the experience of “eating out” more accessible and safe to you?**

- Businesses should take ownership and talk through how they handle kitchens, would make this more likely for them to choose these places, right now they end up for bigger chains because there is more awareness usually
- As someone who lived with someone with an allergy, she has a lot of awareness but sees that most people do not
- At work has had to manage ordering for many people with different dietary restrictions, it is very difficult to find places that have something for everyone

## Key Findings

Across the board, our participants said the biggest difficulty is the lack of information available so that they can be informed when trying a new dish or eating at a new place. A big factor of going out to eat with a severe allergy is having the security that the food you eat will not cause a reaction and that cross-contamination will not occur. On the other hand, individuals with severe allergies do not want to scare the staff and make their interaction of eating out a big deal every time. Our goal with this project was to find a solution that would put the information into the hands of those with severe allergies so that they can feel empowered and safe when they go out to eat without having to feel like they have to rely solely on the knowledgeable ability of the staff or worry about a trip to the hospital.

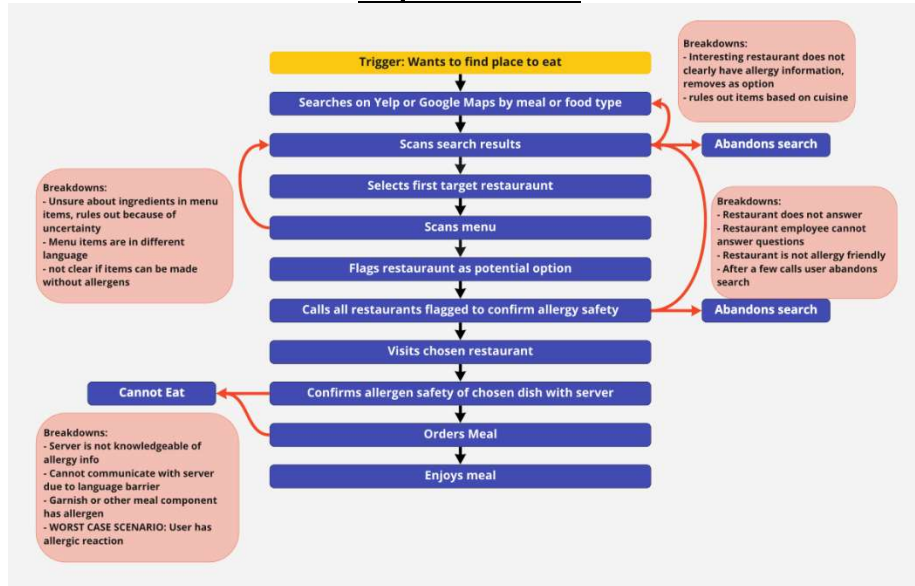
Initially, to narrow down the interview summary input, we performed affinity mapping with our primary co-designer. The results can be seen in the figure below:



## Work Models

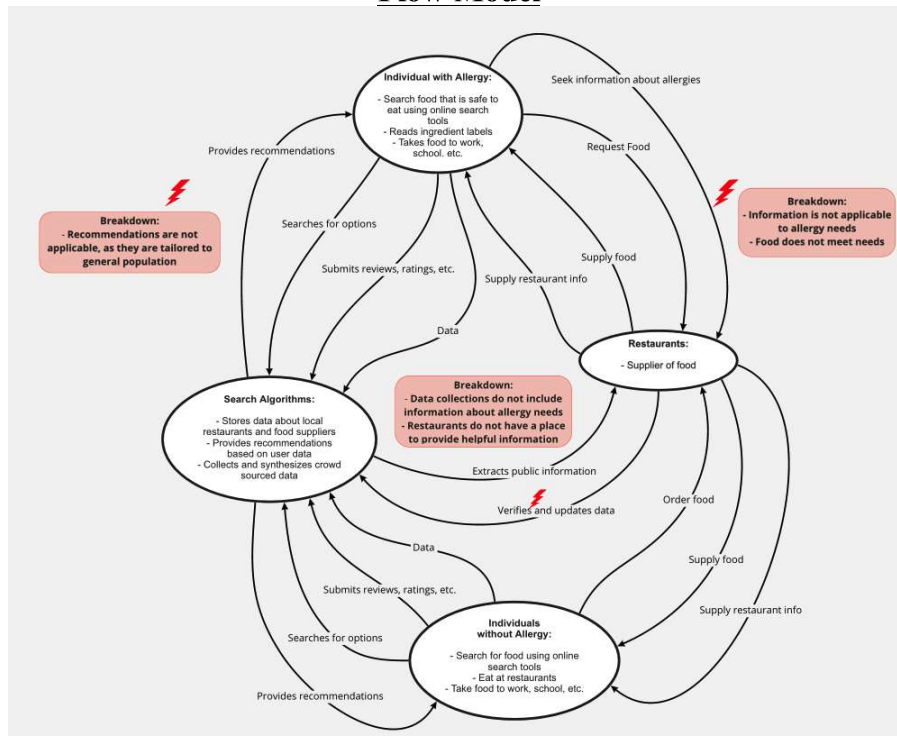
To understand the process users in our target group take when finding a place to eat and to identify breakdowns we built a sequence model with the information provided by our user research.

### Sequence Model



To understand the relationships between our target users and other entities in a scenario, we created a flow model. The flow model made the flow of information clear and helped us identify additional breakdowns during interactions.

### Flow Model



## Design Focuses

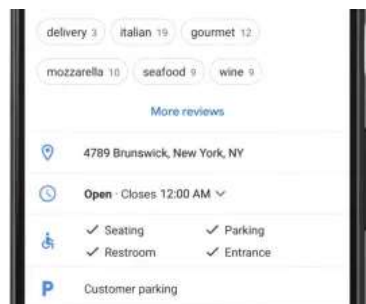
Based on the feedback from our interviews, we decided that we would focus our prototype into an application that is already frequently used – Google Maps. Google Maps has an existing platform to search and sort places and make information about different places visible to the user. Within the platform we wanted to add allergy accommodation information into multiple areas of the application. First, we want to make whether a place is allergy accommodating clear and visible at a high level. Second, we wanted to enhance the information available and add a layer of in-depth allergy information to a place's menu. Lastly, we wanted to make it easy for user to get a better understanding of a place's allergy accommodations through crowd-sourced information like reviews. Focusing around these three areas of interest we began co-designing our prototype.



## Prototype Iteration Process: Co-Design

### Prototype Inspiration

Because our prototype was focused on places to eat, we decided to integrate with Google Maps. Just this past Spring, Google Maps rolled out a feature to provide information about wheelchair accessible places in the community [2]. This feature would allow the community of wheelchair users and others who are mobility limited to be able to get information about the accessibility of a place before they go. Not only does this empower the user of the feature to feel secure in their ability to gain access to a place, but it can also take a lot of frustration and difficulty out of daily interactions for members of this community purely by giving them quick information about a place's accessibility.





We wanted to extend this “know before you go” ability to the food allergy community, as the lack of information and reliance on wait staff were the biggest issues our participants focused on. By designing something that would allow users to understand the allergy accommodation available at a restaurant and find options that would be safe for them to eat before arriving, members of this community said they would feel safer when going out in public and that their allergy would become less of a hurdle.

For our initial prototype we focused on making allergy information visible and showing useful information for users of this community.

### **Narrative Scenario: Target State**

The following scenarios were created with our co-designer as an every day scenario (Scenario 1) and an occasional but highly desired scenario (Scenario 2). These scenarios significantly informed the initial prototype development and refinement.

**Scenario 1:** Jane, who has severe allergies, loves trying new foods and loves to eat at restaurants (or in today’s current climate, order take out to support local businesses). Today she decides that she wants to have some take out Thai food. She pulls out her phone and opens up Google Maps. She enters in her allergies of tree nuts and peanuts and hits enter. Most Thai places are filtered out since many do not cater to nut allergies, but the allergy filter produces a recommendation of a new place not too far from her that allows for allergens to be removed and indicates that it maintains an allergy friendly kitchen, meaning that specific pots, pans, etc. are kept for allergy sensitive orders. She decides to order Thai food and 30 minutes later is eating a delicious meal.

**Scenario 2:** Jane is traveling abroad and decides to try some of the local food. However, she does not speak the language. She uses the allergy filter search feature to narrow down her choices, and selects a restaurant that is known to be allergy friendly. When she arrives at her table, her server does not speak English. She pulls out her phone and finds the allergy translation feature. She enters in the local language, and hits translate and speak so her allergies are spoken allowed in the local language.

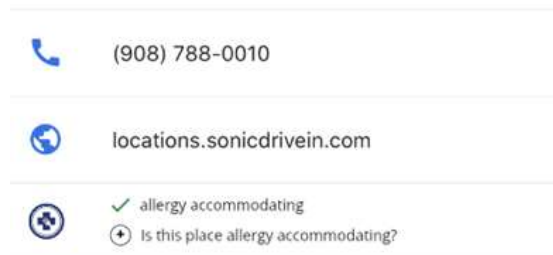
### **FEATURE 1: Visible Allergy Accommodation Indicators and Information**

#### **Iteration 0**

The first layer of information we wanted to make available for users was whether or not a specific place was identified as allergy accommodating. We assumed users would want to know right off the bat whether a place could be considered allergy accommodating, and so the most visible place this could be marked was in the initial results. Google Maps already shows information on whether a place offers take-out, is child-friendly, etc. with a simple checkmark system. Adding the option “allergy accommodating” to these list of options seemed to be the best thing to make this point visible at a high-level for the user.



In addition to adding a top-level allergy accommodating label to a place, we also added an allergy specific section to the overall place information. This was meant to be similar to the accessibility panel in design, but instead of indicating whether or not a place had accessible seating, bathroom, parking, and entrance, it would provide information on the allergy accessibility of a place. We started by including the label of whether or not the place was allergy accommodating at large. In addition, we also liked the idea of being able to crowd-source the information if it is not provided for a place, and so we also included the feature in Google Maps places that would allow people to add information about the allergy accessibility if it did not appear in the menu.



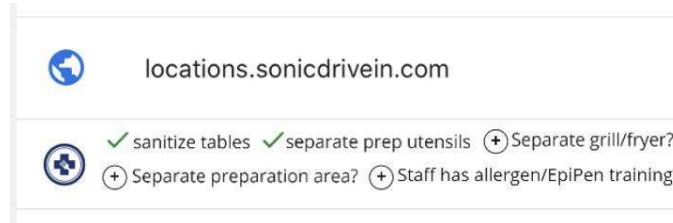
### **Co-designer Feedback Session 1**

Initial feedback on these features was largely positive. Our co-designer liked that it was clearly visible and could be one of the first things that could be seen about a place helping users decide quickly whether or not they should further invest time into looking into a place. Our co-designer thought that integrating it into the already existing Google Maps interface would be super intuitive for the user. Our co-designer did mention that we could probably put different allergy information in the allergy panel. She felt the point of whether or not a place was allergy accommodating was clear in the initial label, and that it would be better to put other information in that panel that would allow users to know stuff like if the staff is trained on how to administer an EpiPen or whether or not tables are sanitized.

### **Iteration 1: Prototype Refinement**

In response to our co-designers feedback we went ahead and changed the information contained in the allergy panel on the restaurants overview page. We decided to add information that was more specific about how the place was allergy accommodating and what type of measures they take. Using guidance from the Food Allergy Research & Education Organization's guide on what kind of questions people with allergies should be asking at restaurants, we added five allergy markers that could indicate the level of precaution taken at the restaurant. These precautions included: if tables were sanitized before use, if separate preparation cookware could be used, if a separate grill or fryer could be used, if a separate preparation area could be used, and if staff had training on how to use an EpiPen and what to do in the case of an allergic reaction. As in the previous iteration, if the information was not available about a

place, we made it possible to crowd-source to provide other members of the allergen community with some useful information someone might acquire by visiting a place.

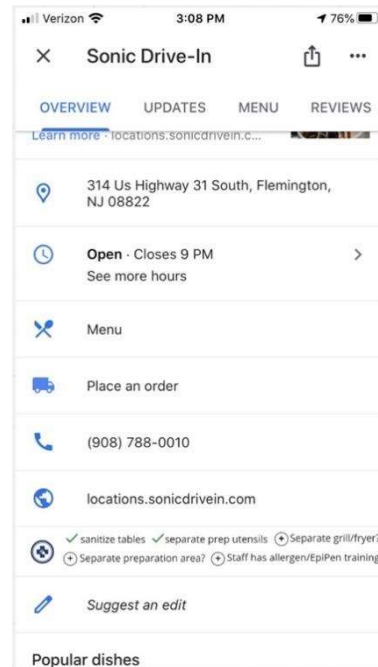
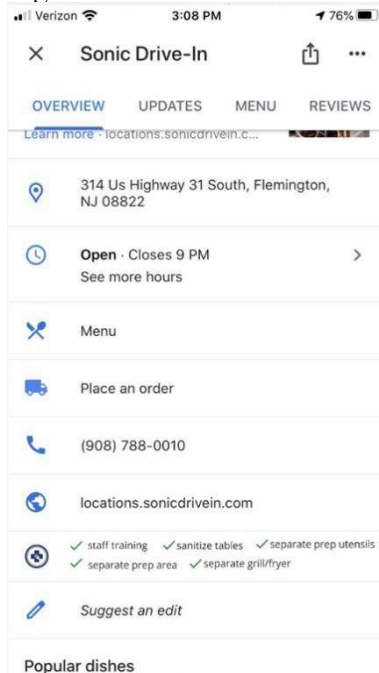


## Co-designer Feedback Session 2

Our co-designer liked the changed contents of the allergen panel on the place's overview page. They felt that the information provided significantly enhanced what level of comfort they might feel eating at a place, and might sway their decision to select that place to eat. In addition, they brought up the point that people who may have high sensitivity and whose reaction can be triggered just by touch or smell could benefit a lot from the information in this allergen panel.

## Final Prototype

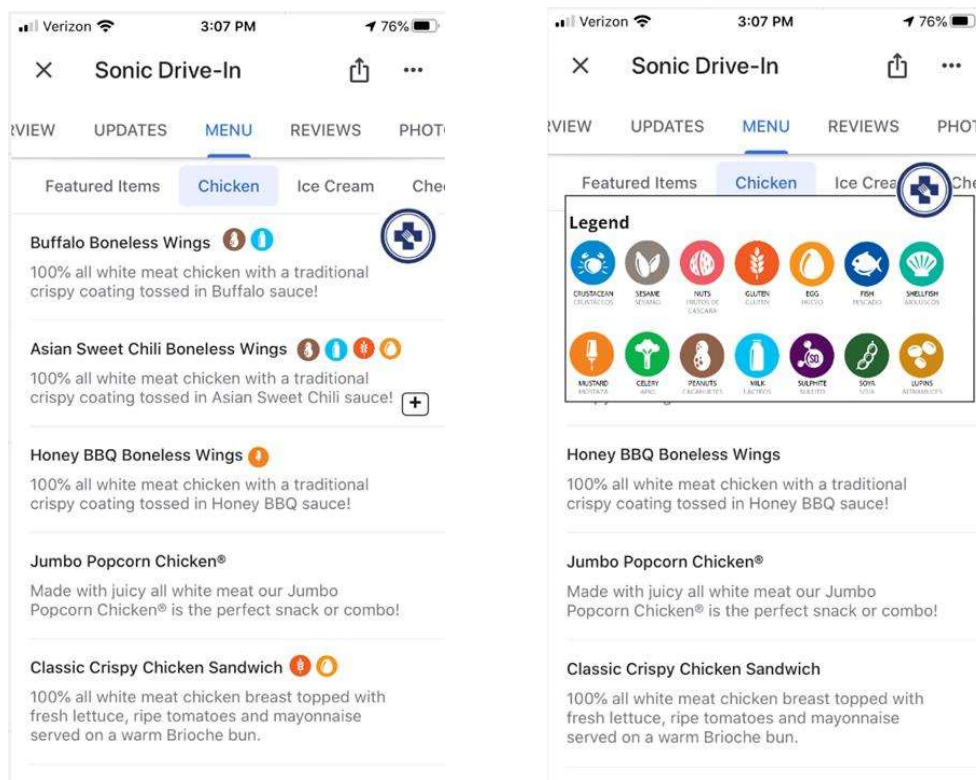
No additional changes needed.



## Feature 2: Allergy Symbols and Legend

### Iteration 0

Another desire from our participants was access to more specific information about menu items. It was important to them to be able to get information on how many and what kind of options would be available to them before they went somewhere. Being able to access this information beforehand would allow people with severe allergies to make a plan before they went somewhere. One common theme amongst our user research was the trend to stick to places and dishes that the user is familiar with because of how difficult it can be to get information on different restaurants or dishes. We embedded allergen information into the menu so that people who suffer from allergies could access this information easily. Our co-designer suggested symbols as they are universal and are easier to identify quickly for a user than text. Also, symbols are often how things are currently indicated for dietary restrictions or spiciness. We added an allergen legend pop-up so that users could quickly check what the symbols represented if they were not familiar with them and also for simplified viewing when looking through the menu.

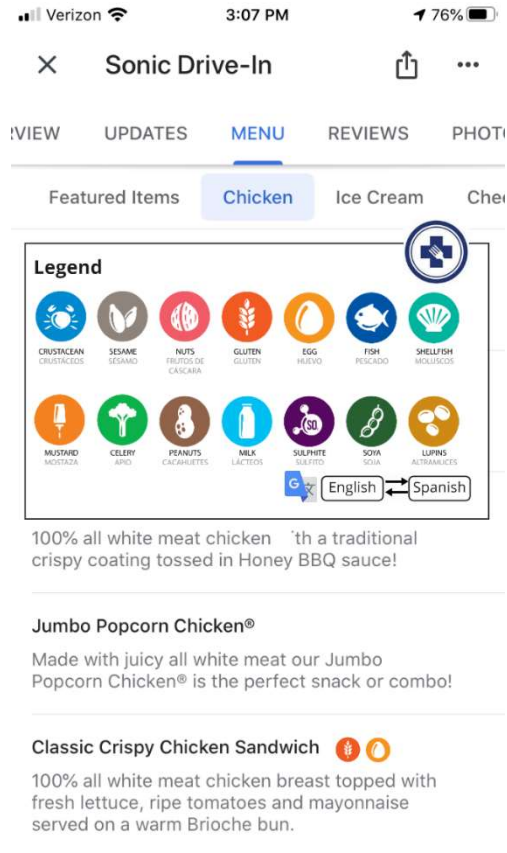


### Co-designer Feedback Session 1

Our co-designer liked the added information into the menu as well as the use of the icons. She mentioned that it would be useful for when people travel if there was a way to translate allergies so that it could be understood by someone who didn't speak the user's native language. She mentioned that this is actually where she has the most trouble because when she is traveling she eats out the most, and depending where she is, language can pose a significant barrier in determining if something is safe to eat. She thinks adding the symbols are a great start to reducing this barrier, but the symbols may not be known by the community at large and so being able to communicate the allergens in a different language could be a significant addition.

## Iteration 1: Prototype Refinement

To address the issue of finding food in a foreign country or when the restaurant staff might not speak your native language that was presented by our co-designer, we implemented a Google translation feature into the allergy legend. This way users could easily translate their allergen into a different language and be able to communicate by picture and with words what kind of allergen they have. Because Google Translate is a Google feature that is super built-up and easy to integrate, we added an additional translation selection into the allergy legend to be able to quickly display the allergen name in a different language right there in the panel.

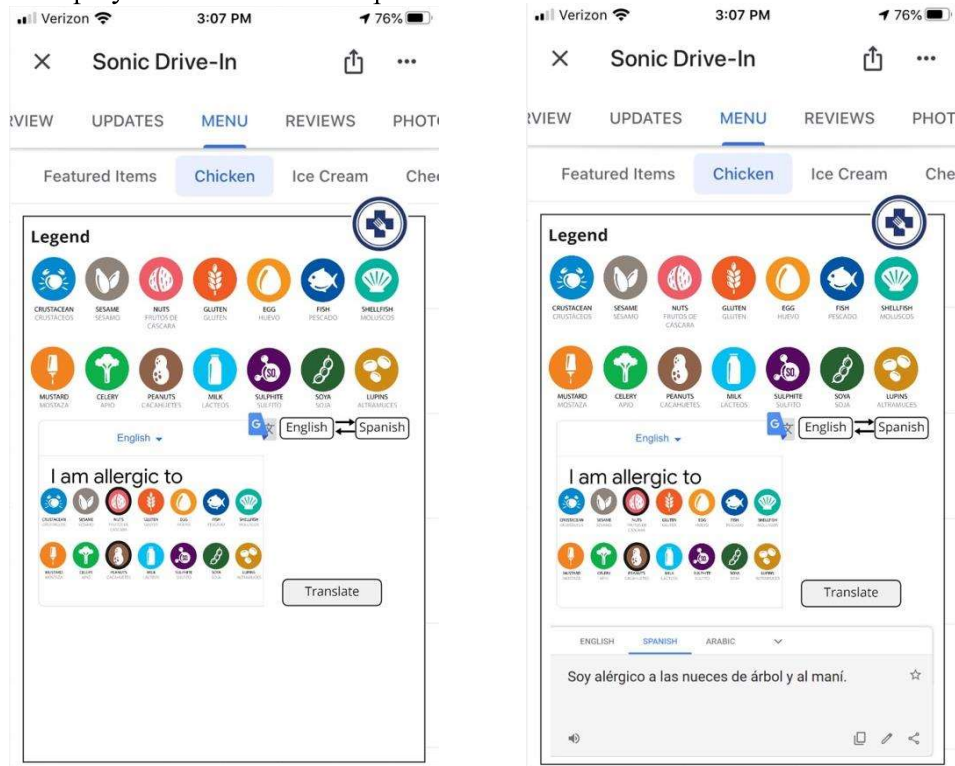


## Co-designer Feedback Session 2

On top of being able to translate the words of the allergens into a different language, our co-designer mentioned that it would be super useful if the interface actually translated the phrase “I am allergic to xyz..” into another language. Additionally, she mentioned it would be nice if you could play the translation out to understand how to pronounce the phrase or to play it to someone else like you can already do in Google Translate.

## Final Prototype

The translation feature of the legend was expanded upon. We added a way to translate “I am allergic to xyz..” so that our user could just reference the symbols above and select their own allergens. Once the user hits translate, the allergens translated in the language selected and the translated sentence appeared at the bottom of the page. In addition to the full sentence translation being available, the embedding of Google Translate into the page also allowed us to incorporate a way to play the translated audio from the user’s phone so that they could play it for a potential staff member. The user can hit the audio button on the bottom left to play the audio from their phone once it has been translated.



## **FEATURE 3: Menu Item Content and Accommodation Specifics**

### Iteration 0

Some of the criteria that our users wanted to be able to access along with information about dishes was the ingredients in a dish and whether or not the dish could be altered. To facilitate this, we made an addition so that when a user clicks for more information about an item they are redirected to a page that contains the initial information about the item including the allergen symbols, as well as a full ingredients list and if the dish can be altered when ordered.

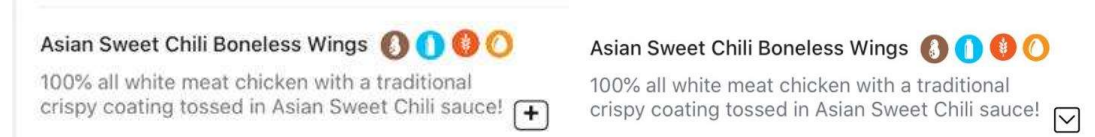


## Co-designer Feedback Session 1

Our co-designer liked the use of symbols in the menu section. She felt it made the section easy to read, but there was some concern whether or not it would be easier and more intuitive if the symbols were next to items that contained the allergen or did not contain the allergen. Ultimately, our co-designer informed us that the standard currently is to point out the allergens in the item (ex. Contains: milk, peanuts). Based on that point, she said it made most sense to place the icons next to items that contained an allergen so those could be avoided. It was also brought to our attention that the button to expand menu information may be confusing as the plus sign usually refers to adding an item to a cart, and so the button design should be chosen so that it is clear that it can be pressed to gain more information on the item.

## Iteration 1: Prototype Refinement

The button for more information about an item was changed to more clearly mark it as a way to expand on a specific menu item. The symbols remained as is, next to an item if it contained that allergen.

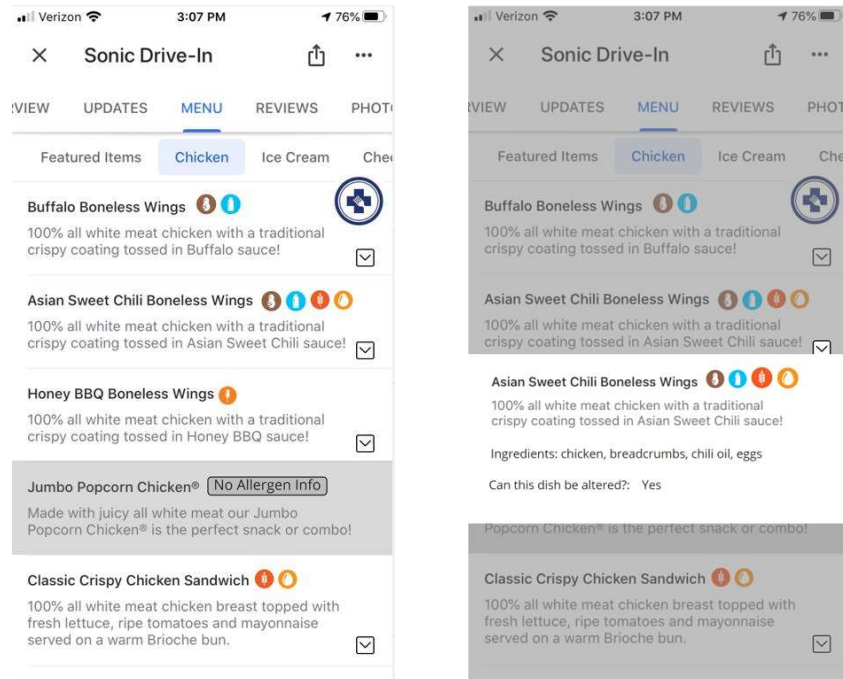


## Co-designer Feedback Session 2

Our co-designer liked the change made to the button and felt it was far more indicative of an option for more information on a specific menu item. Our co-designer did bring up a good point that it may not be clear just by not showing an option to expand on an item that the item does not have allergen information available. She mentioned the importance of clearly differentiation between an item that has no allergens in it and an item that has no additional information entered. She said that our current prototype did not make this distinction clear and that we should find a way to signal this distinction in an obvious manner to a user.

## Final Prototype

Taking the input from our co-designer, we went ahead and decided the best way to indicate that a menu item simply did not have information entered for it was to darken the item and label it as “No Allergen Info”. We added this change into our menu screen so that it was clear which items users should not even bother to look at when searching for items that fit their allergen restrictions.

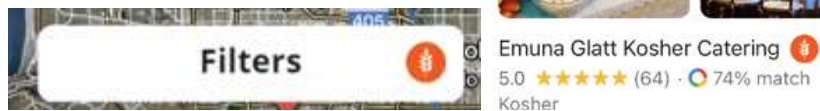
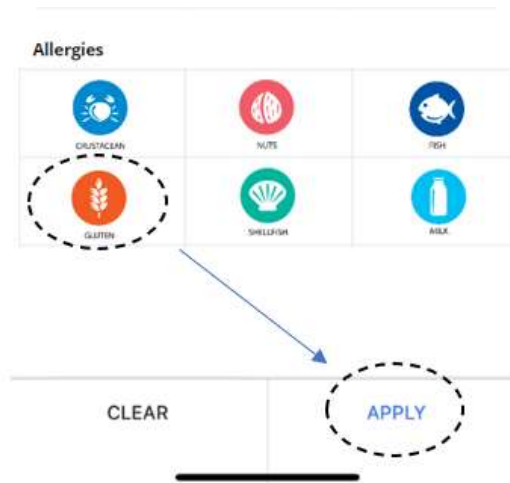
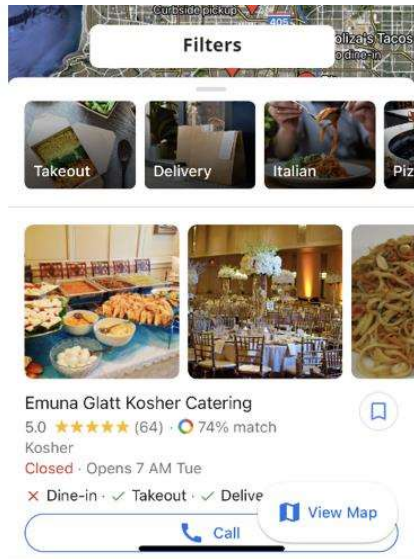


## **Feature 4: Search Filtering by Allergy**

### Iteration 0

Since individuals with allergies are going to be looking for restaurants that best accommodate their specific allergy, instead of simply the best reviewed location or the closest, we decided to add search filtering as a feature to our prototype. Given that we want the filtering aspect to be more prominent, we moved the filter button right above the search results and made it larger. Within the filters menu we added a section that lets users select what type(s) of allergy they may have. Once they have applied the filter, both filter button and the search results will have a symbol representing the allergy, to show that this was being factored into the weighting of what results were shown to the user.



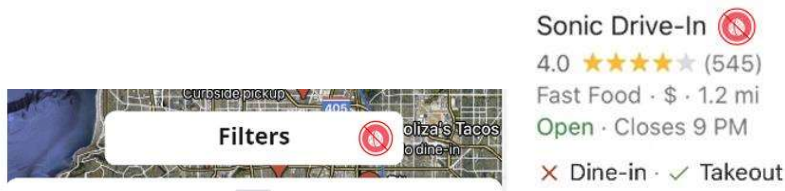


### Co-designer Feedback Session 1

Our co-designer liked the filtering feature for searching restaurants. She thought it was useful for looking up places that are both highly rated but also meeting the needs not having of specific allergens being an issue with the presented options. However, she noted that the use of the various symbols seemed to visually indicate that the allergens were *present* at the restaurant, as opposed to being *allergy accommodating*.

### Iteration 1: Prototype Refinement

The icons next to the filters button and search results were altered so that they clearly show that the places *do not* have those specific allergens when appear. With the stop symbol making it visually consistent with the use of the symbol in menus, etc.



### Co-designer Feedback Session 2

Our co-designer thought the new changes now made it in-line with her expectations of how such a feature would function.

### Final Prototype

No changes were made compared to the previous iteration.

## **FEATURE 5: Allergen Rating**

### **Iteration 0**

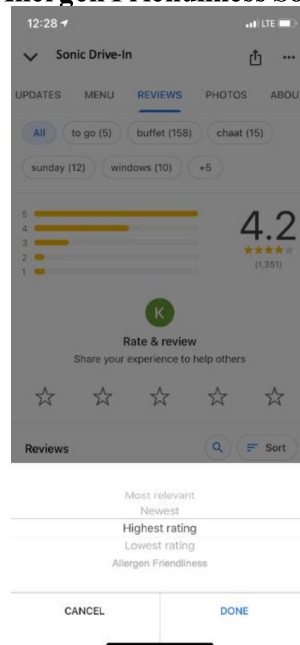
For the first iteration, we focused on adding functionality for an allergen rating scheme. The images below show the updates that were added. While previously only able to add images to their review, reviewers can now add allergen information as well. Their review will then be converted to the color purple and will be noted as a review by someone who has an allergy. Viewers filtering for allergen reviews will see these reviews and be able to filter to improve their search experience. Questions asked will also impact the checkboxes displayed next to restaurant such as allergen safety level, staff knowledge, etc.

## Allergen Rating



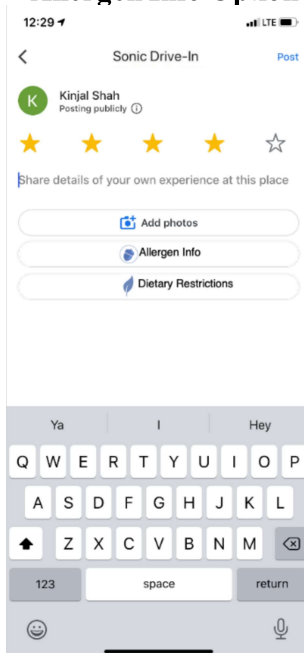
By clicking on the *Allergen* button, only allergen ratings are seen in the reviews section.

## Allergen Friendliness Sort



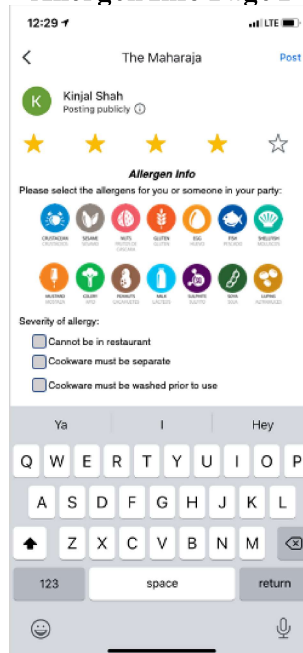
Reviews can be sorted by allergen friendliness.

## Allergen Info Option



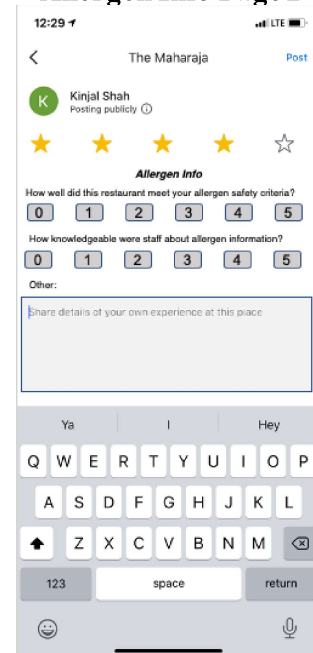
Reviewers are able to select allergen info. If they select allergen info, their review will be identified as an allergen review.

## Allergen Info Page 1



Reviewers are able to specify their allergy information.

## Allergen Info Page 2



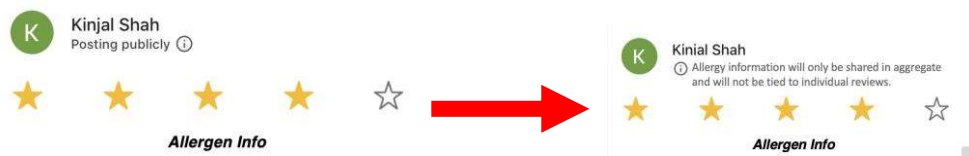
Reviewers are able to specify their experience.

## Co-designer Feedback Session 1

The co-designer loved this feature and felt that it would be very helpful to be able to view allergy experience ratings. Restaurants that may get an overall lower rating, may in fact be very high on allergy friendliness. The major feedback from the co-designer was that currently, every review is tied to a user. Individuals may not want to have such information publicly available.

## Iteration 1: Prototype Refinement

Based on the co-designer's feedback, we updated the text to clearly indicate that the provided information would not be available publicly. Only the rating and any review text would be public, similar to the current state. Allergy information would only be used to provide the aggregate allergy rating and help influence recommendations/review sorting.

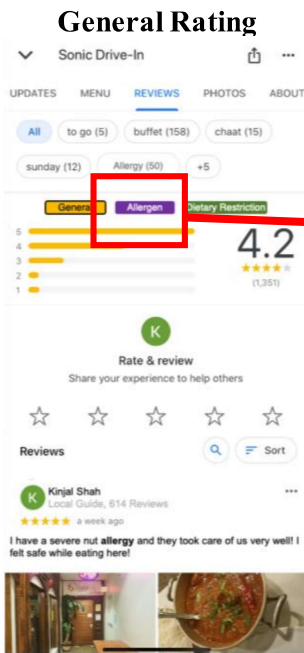


## Co-designer Feedback Session 2

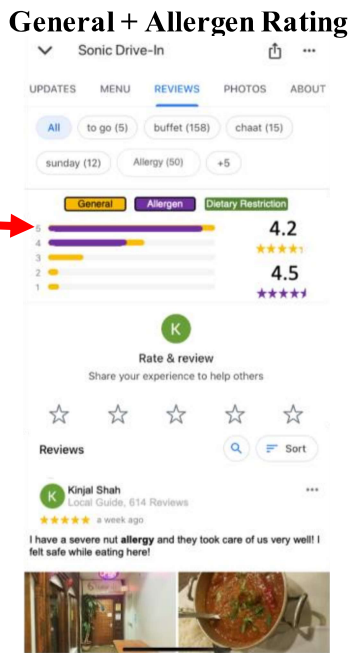
The update makes it more clear; however, co-designer is still concerned with home page. Since the purple stars are displayed by the user, the user is still specifically identified as having an allergy. If they choose to put it in their review it is okay, but it should not be default because they submit allergy info, this may deter people from filling out this information.

## Final Prototype

For the final prototype, we removed any direct default relationship between the allergy form and the user review. If the user chooses to reveal their allergy information in their public text, that is allowed as in the present state; however, their review will not be by default marked as a review by an individual with an allergy as in the first iteration. The purple stars are only available in aggregate, and each reviewer response will just be displayed as a general review as in the current state to protect confidentiality of their information.

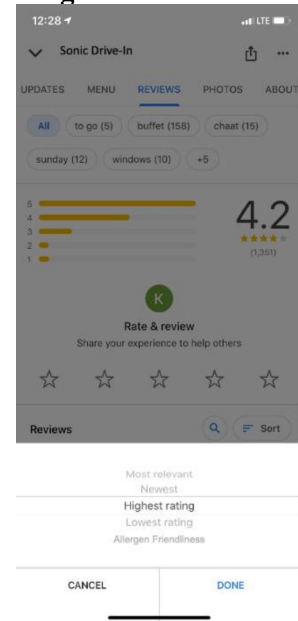


General view similar to current state. General, allergen, and dietary restriction review options added.

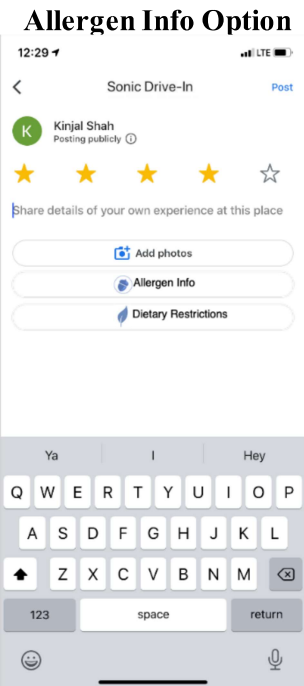


By clicking on the *Allergen* button, an allergen rating is overlay on top of the general rating information.

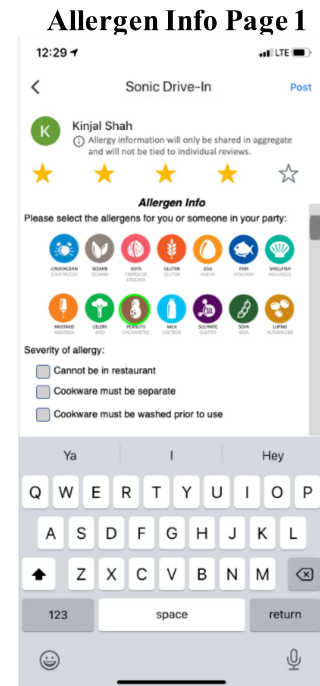
### Allergen Friendliness Sort



Reviews can be sorted by allergen friendliness.



Reviewers are able to select allergen info. If they select allergen info, their review will be counted towards the “allergen rating.”



Reviewers are able to specify their allergy information.



Reviewers are able to specify their experience.

# Prototype Evaluation

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**\*\* Please note: To protect the anonymity of the users, we did not publish their recordings. However, we have provided a walk through video to display the tasks they were asked to perform.**  
Video walkthrough of the final prototype: <https://youtu.be/4rgvT2FVjPo>

We had the co-designer and additional user run through a script scenario based on the user stories initially developed. This script allowed for the user to view and experience each new added feature integrated into the application. To get an understanding of how intuitive the interface was to use, we got feedback from other members of this community outside of our co-designer. We asked our additional users to perform a set of tasks given a setting that they were planning to go out to eat and wanted to find a place for food nearby.

## **Co-Designer: Jane Doe 1**

*Positive Feedback:* “If actually implemented, this would make everyone with allergies lives a whole lot easier.” Our co-designer was very happy with the final result. She felt that the interface not only made it easier to search for results that would lead to positive experiences, but it also allowed for increased awareness for allergies overall. Similar to how vegetarian, vegan, gluten free has gotten increased awareness, she feels that the presence of the icons will increase awareness for allergy accommodations.

*Constructive Feedback:* She is concerned is whether restaurants will provide the information necessary to make this a reality. She also suggested changing the icon for allergies as the current one is not very intuitive; however, she admits one does not exist, so perhaps after some time it will become more intuitive. With regards to the review filtering, our co-designer feels that a nice to have would be to not only be able to view the “most helpful” positive allergy review, but also the “most helpful” negative allergy review, as it is often important to see the critical cases, especially if one has a severe allergy.

*Experience with Co-Design:* Our co-designer felt that the experience was very pleasant. She enjoyed taking part in the process and felt that we were very respectful of her wishes.

## **User: Jane Doe 2**

*Positive Feedback:* Jane Doe 2 enjoyed the interface and felt that it addressed an important gap that exists for people with severe allergies compared to those who don’t. Overall, she felt that the interface brought awareness to her medical condition, and would make other people more thoughtful towards people with severe allergies when choosing places to go out to eat and interacting in those public spaces. One of the features she really like was the usability of the icons to indicate the allergens. She felt they were super intuitive to see and were similar to indicating vegan options or other dietary restrictions seen on menus currently. She felt this would help her in finding options that were friendly to her allergen and increase her comfort level when ordering and eating at new places.

*Negative Feedback:* Although Jane Doe 2 liked the translation feature of the interface, she found its integration into the allergy menu confusing. Her suggestions were to either create a button for the translation feature in the allergen menu that would expand to another menu or to just separate it from or integrate it better into the legend portion of the menu for less confusion to the user.

## Conclusion and Next Steps

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Based on the reviews above and the usability assessment below, we believe we were able to achieve a solid initial prototype that is well received by the users. Overall, errors were low and any errors came from unfamiliarity with icons, which is a byproduct of lack of awareness and standardization for this domain.

To address the concerns of the co-designer, we would initially populate all information based on crowd sourced data. Should restaurants choose to confirm the information, an additional notifier would be placed that the restaurant page owner acknowledges and maintains allergy information. There are lists of questions that individuals with allergies are told to ask at restaurants, we hope in further iterations to build out a restaurant facing interface that will allow restaurants to easily supply this commonly requested information.

	Feature 1	Feature 2	Feature 3	Feature 4	Feature 5
Learnability	High	High	High	High	High
Efficiency	High	High	High	High	High
Memorability	<i>Not Applicable Given Project Timeline</i>				
Errors	Medium	Low	Low	Low	Medium
Satisfaction	High	High	High	High	High

## References:

- [1] <https://www.foodallergy.org/resources/facts-and-statistics>
- [2] <https://blog.google/products/maps/wheelchair-accessible-places-google-maps/>
- [3] <https://www.foodallergy.org/resources/avoiding-cross-contact>
- [4] <https://www.youtube.com/watch?v=-iccWRhKZa8>