

R1 Project Proposal

PSYC 6023 / Research Methods for HCI

Gabriel Britain

John Britti

Phoebe Tan

Wenrui Zhang

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01 The Problem

For many, the opportunity to dine out presents an opportunity to set aside the worries of food preparation and socialize with friends and family. However, for those with dietary restrictions, specifically vegetarians and vegans, dining out is a process that involves prior planning, research, and a significantly limited pool of options. In the worst-case scenario, vegetarians and vegans might end up eating a meal they are disappointed with or be unable to eat at all. This can make the process of dining out with friends an awkward or uncomfortable experience. In addition, given that 5% of Americans identify as vegetarian and 3% as vegan¹, there is a non-trivial number of individuals who encounter these situations. We intend to improve the experience of being a vegetarian or vegan dining out.

1.1 Current State and History

While veganism is clearly defined as an individual who refrains completely from consuming animal products (as food or otherwise), vegetarianism varies wildly in terms of strictness. There are pescatarians, ovo-vegetarians, lacto-vegetarians, ovo-lacto-vegetarians, fruitarians, etc. For the sake of clarity, we will define vegetarians as people who do not eat animal flesh (but do consume dairy and eggs).

As mentioned above, the number of individuals matching our definitions of vegan and vegetarian constitute approximately 3% and 5% of the population of the United States, respectively. While this proportion has remained relatively stagnant since 2012, interest in consuming plant-based diets has grown significantly in recent years. Plant-based food sales grew approximately 8.1% in 2017 alone and exceeded \$3.1 billion last year. Plant-based alternatives to dairy products are soon expected to account for 40% of dairy beverage sales¹. As sales of plant-based foods have increased without a similar increase in self-identifying vegans or vegetarians, it can be assumed that there is a greater overall interest in these kinds of products. This can be seen in nationwide chain restaurants' adoption of these foods such as Burger King's Impossible Whopper², Chipotle's recent addition of sofritas as a protein in their burritos and bowls³, Del Taco's plant-based tacos⁴, and Dunkin Donuts' plant-based breakfast sausage sandwich⁵, to name a few.

Despite increased interest in plant-based foods, anecdotal evidence⁶ and our initial research findings indicate that vegans and vegetarians encounter obstacles when dining out. These issues include increased and repeated prior research, a lack of confidence in menu descriptions, uncomfortable dining experiences, and difficulty finding new venues.

For vegans and vegetarians, it's often difficult to determine whether a restaurant offers viable meal options without physically visiting the venue. Oftentimes a prospective plant-based diner will undergo several touch points before even going to eat, combining internet searches, reviews, photographs, and menu descriptions online. While this is easier when visiting for larger chain

restaurants, small local restaurants can lack up-to-date, readily accessible menus online (due to financial or time constraints).

Our exploratory research indicated that vegans and vegetarians also feel a lack of confidence with restaurants without online menus, or menus that don't explicitly list preparation methods or ingredients involved in creating a dish. For example, a vegan could order vegetable fajitas, but the dish could arrive at the table topped with sour cream, which would consequently make the dish not vegan. This can lead to situations where the diner does not want to embarrass the group by sending the dish back, and so will compromise their own dietary restrictions to keep the social atmosphere, leading to an uncomfortable dining experience.

In places where veganism and vegetarianism are culturally rare, diners can find themselves in awkward situations when asking if any plant-based options are available. If no dedicated plant-based options exist, vegetarians and vegans might have to settle for ordering multiple side dishes or even just an order of fries, if possible. These meals can be unpleasant and nutritionally unbalanced. Even before arriving at the restaurant, vegans and vegetarians can feel self-conscious when dining out with a group, as the group will defer restaurant selection to the person with the most restricted options, even though vegetarian and vegan options can be created at non-plant-based restaurants. Lastly, in places where vegetarians and vegans are unfamiliar with dining options, it can be difficult to support local businesses when unsure of whether the restaurant can support diners with plant-based dietary restrictions.

1.2 The Users

Aside from vegetarians and vegans whose dining experiences could be simplified, individuals looking to transition into vegetarian or vegan diets can reduce the overwhelming number of new decisions they have to make for themselves when dining out.

As interest in plant-based food increases, individuals looking to transition into plant-based diets can be overwhelmed with the number of new decisions that they have to make. In America, most vegetarians were not raised vegetarian, but consciously made the decision to convert from an omnivorous diet for a variety of reasons, such as improving personal health, supporting animal welfare, and reducing environmental impact⁶. Lastly, individuals who have recently transitioned to vegetarianism and veganism and are looking for motivation to maintain their recent dietary change could benefit from a lower cognitive load in evaluating restaurants.

1.3 Stakeholders

Potentially interested stakeholders include restaurant owners and/or restaurant managers looking to increase their pool of diners, as well as vegetarians or vegans, or their family and friends, interested in simplifying the process of dining out.

1.4 Significance

By increasing their visibility for vegetarian and vegan meal options, restaurant owners can add a previously unavailable demographic to their pool of potential diners, which in turn could increase revenue. This could be especially useful for smaller, local restaurants that lack an online presence or are limited by a language barrier. Additionally, vegetarians and vegans looking to broaden their pool of potential dining options would have an interest in supporting a solution.

Additionally, simplifying the dining out process for vegans and vegetarians could make resources more accessible not only for vegans and vegetarians, but also for people looking to transition into veganism or vegetarianism.

Aside from monetary and personal aspects, increasing the visibility of plant-based could have an ecological impact by reducing the amount of animal products consumed, as well as an impact on animal welfare by reducing support for markets that diners consider unethical or cruel.

1.5 Existing Systems and Related Work

1.5.1 HappyCow

HappyCow is a public website designed to help people find plant-based / vegan options. It is run by vegans and staffed by vegans and vegetarians. Users contribute listings for previously unlisted vegan restaurants (as well as vegan bed and breakfasts) as well as modifications for existing listings if necessary. All users looking to submit a listing or review are required to create an account with *HappyCow*. Restaurant owners can submit a verification request to the website, which will allow them to instantly update their hours, their vegan/vegetarian friendliness, and respond to user reviews. Restaurant menus are not accessible directly from a restaurant's listing, though links to the restaurant's online presence, directions, and a link to the restaurant on *Uber Eats* are provided.

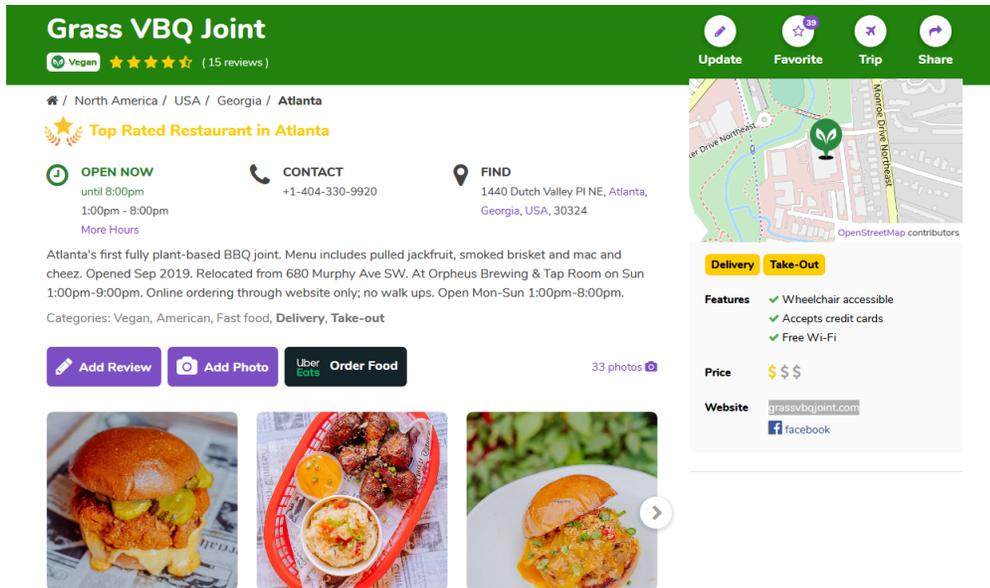


Figure 1 Screenshot of the HappyCow website

The website is mobile-friendly, but *HappyCow* also provides a mobile app (available on Android and iOS) that allows users to view listings without a *HappyCow* account.

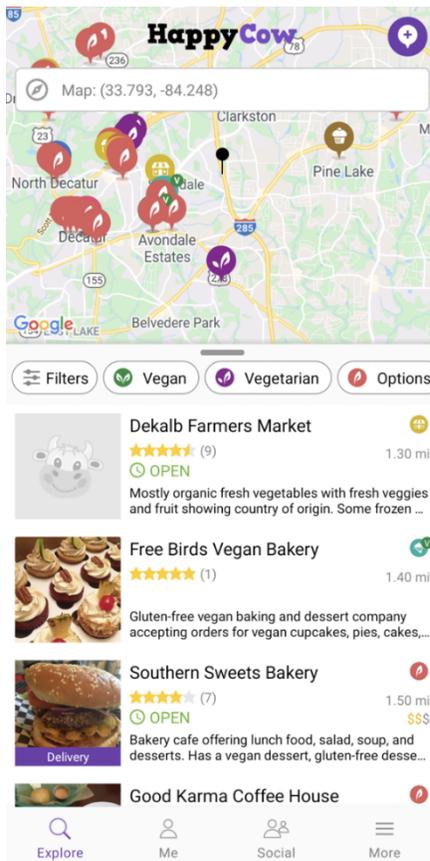


Figure 2 Screenshot of HappyCow mobile application

Both the *HappyCow* mobile app as well as the *HappyCow* website have a few contexts of use: First and foremost, diners can filter and sort restaurants according to their dietary preference before visiting a physical location using reviews and listings left behind by other diners. Post-meal, users can leave reviews or feedback about the restaurant on *HappyCow*, giving further information to future diners. The post-meal review process is likely conducted via mobile device, whereas the pre-meal search process could be performed via mobile device or on a desktop computer. Additionally, restaurant owners can use *HappyCow* to interact with their pleased and disgruntled customers, as well as update restaurant information to increase their online presence. As this is a more time-intensive task, it most likely is performed in a desktop environment. Lastly, the context of being a moderator approving restaurant owners' requests as well as moderating reviews on *HappyCow* should be considered. Depending on how intensive the review process is, this could occur on a desktop or on a mobile device.

1.5.2 Yelp

While Yelp is not a dedicated solution to finding vegetarian/vegan dining options, it does support filtering venues by category, and has both "vegetarian" and "vegan" categories that are selectable.

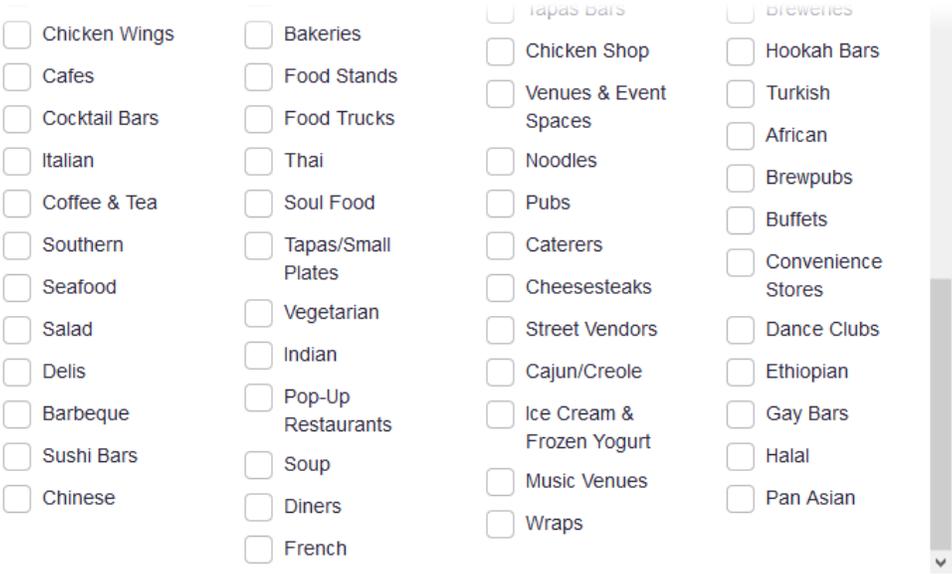


Figure 3 Only the desktop web site for Yelp supports category-based filtering

However, only the desktop web site for *Yelp* supports category-based filtering. When viewed from a mobile device, *Yelp's* web interface initially redirects the user to their platform-specific app store, and when the user attempts to circumvent that, it presents only basic filtering and sorting settings. Their mobile application works similarly. This means that it is not possible to search for vegetarian/vegan restaurants through *Yelp* when using a mobile device. However, unlike *HappyCow*, menus to the restaurants are directly accessible from *Yelp* restaurant listings (though these links may be broken).

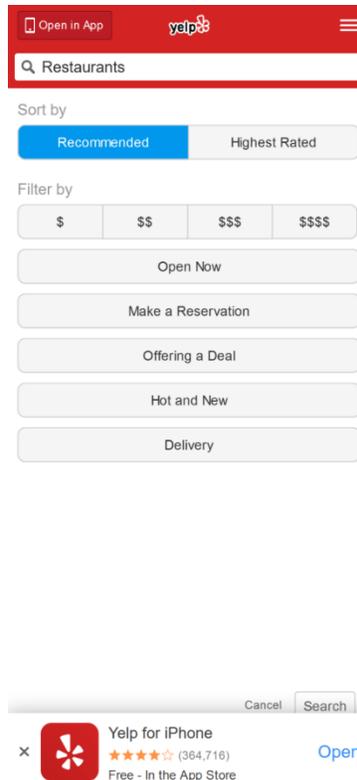


Figure 4 Basic filtering and sorting settings only in a mobile browser

The main context of use for *Yelp* is for potential diners to determine restaurant quality through reviews left by other diners, as well as leave reviews and ratings. While users can search for “vegetarian restaurant” or “vegan restaurant” using the *Yelp* search bar, results are not guaranteed to be vegetarian- or vegan-friendly unless filtered for explicitly on desktop web. Restaurant owners can also “claim” their business, allowing them to update restaurant information as well as respond to customer reviews.

1.5.3 Google

Multiple exploratory interviews conducted by our team indicated that users would simply search *Google* for the name of a restaurant they were interested in and fall back to other methods if the restaurant did not have an online presence. If the restaurant did have an online presence and was accessible through *Google*, users would view the restaurant’s menu and determine (based on presented ingredients) if the menu met their dietary restrictions.

In addition, *Google Maps* has features dedicated to helping users find places to eat. While these features do not explicitly allow users to filter venues by dietary restrictions, *Google’s* search capabilities can allow rough approximations of filtering by searching for “[vegan/vegetarian] restaurant”. From there, users can filter based on geographic location, price, or rating, like other resources.

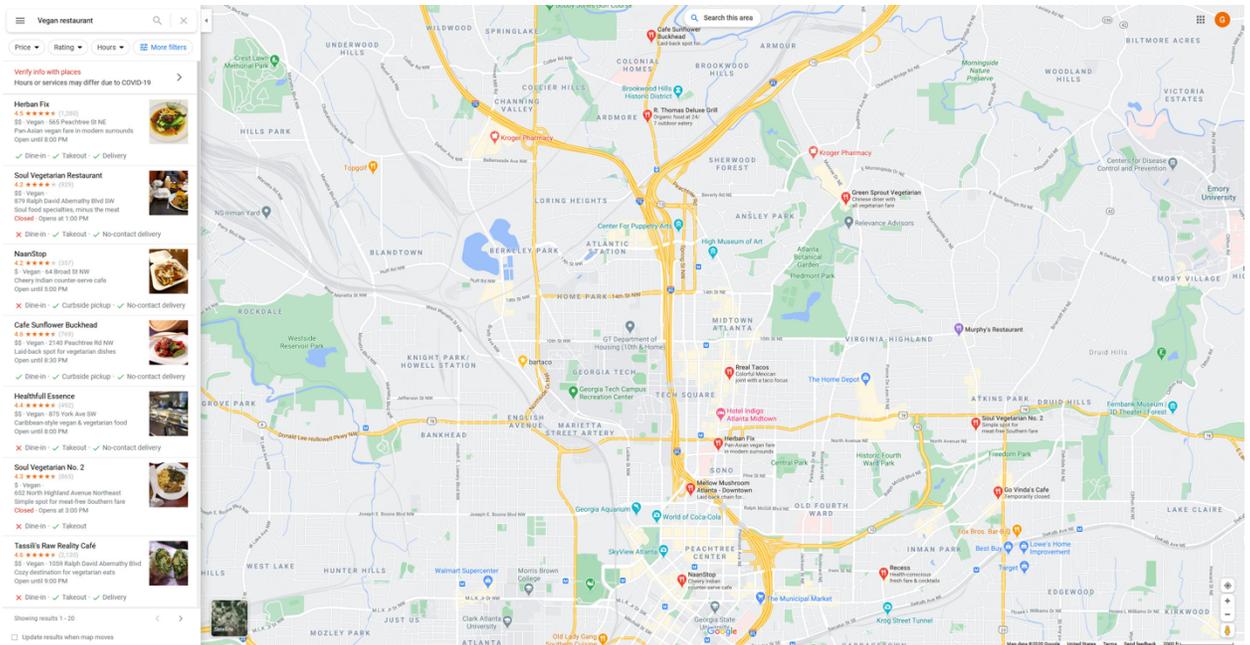


Figure 5 Google Maps on desktop browser

Google Maps and Google Search are designed to be used on mobile and desktop interfaces equally. According to the interviews conducted by our team, diners mostly interacted with Google pre-meal.

1.5.4 Find Me Gluten Free

Find Me Gluten Free (FMGF) is a public website dedicated to helping those with gluten intolerances and allergies find places that are safe to eat at. While not specifically vegetarian- or vegan-focused, *FMGF* offers functionality akin to *HappyCow* and *Yelp*. Users submit listings and ratings for restaurants, and restauranteurs can request control of their restaurant's listing to update information. *FMGF* offers both a desktop and mobile web site, as well as a dedicated mobile app that users can download. In addition, they offer a premium subscription that removes advertisements, adds a "Most Celiac Friendly" filter, as well as a filter for what restaurants are currently open, and that lie along the user's current direction. *FMGF* also allows users to view local restaurants only.

Like *HappyCow* and *Yelp*, the anticipated use contexts of *Find Me Gluten Free* exist before determining a restaurant to eat at. The existence of both mobile and desktop interfaces allows users to have freedom in how they interact with the system.

Local Gluten Free Places

Sort By Best Match

Ecco
 ★★★★★ 14 ratings \$55
 40 7th St NE, Atlanta, GA 30306 0.7 mi
 Celiac Friendly, Gluten Free Menu, Appetizers + 4 more
100% of 12 votes say it's Celiac friendly

Bantam & Bidly
 ★★★★★ 89 ratings \$\$
 1544 Piedmont Ave NE, Atlanta, GA 30324 1.8 mi
 Celiac Friendly, Gluten Free Menu, Dedicated Fryer + 9 more
100% of 32 votes say it's Celiac friendly

South City Kitchen Midtown
 ★★★★★ 18 ratings \$\$\$
 1144 Crescent Ave NE, Atlanta, GA 30309 0.7 mi
 Gluten Free Menu, Brunch, Late Night + 2 more
70% of 10 votes say it's Celiac friendly

Egg Harbor Cafe
 ★★★★★ 35 ratings \$
 1820 Peachtree St NW, Atlanta, GA 30309 1.8 mi
 Celiac Friendly, Gluten Free Menu, Burgers + 9 more
100% of 12 votes say it's Celiac friendly

Chick-a-Bidly
 ★★★★★ 28 ratings \$
 2154 19th St NW, Atlanta, GA 30363 0.7 mi
 Celiac Friendly, Gluten Free Menu, Chicken Fingers/Nuggets + 5 more
85% of 21 votes say it's Celiac friendly

Metrofresh
 ★★★★★ 10 ratings \$
 931 Monroe Dr NE, Atlanta, GA 30308 1.6 mi
 Celiac Friendly, Gluten Free Menu, Cider + 4 more
100% of 8 votes say it's Celiac friendly

Full Screen Map



Discounts, Giveaways & More!
 Chat with brands, watch cooking demos, join educational presentations. **Sep 24-26**

KEEP ME UPDATED

- Gluten Free Features
- Appetizers
 - Arrosas
 - Bagels
 - Beer
 - Bread/Flans
 - Breakfast Sandwiches
 - Brownies
 - Burgers
 - Cake Pops
 - Cakes
 - Catamar
 - Calzones
 - Celiac Friendly

Figure 6 FMGF allows users to view local restaurants only

02 Potential Solution

Through our initial user interviews and market analysis, we have identified a few areas in our problems space which are ripe for an intervention:

2.1 Menu Legibility and Consistency

Nearly all our user interviews suggested that menus at restaurants have inconsistent methods of identifying plant-based options. There is likely a way to expedite the ordering process for our users by designing a more readable menu.

2.2 Confidence in Menu

More than just enhancing the quickness of ordering, we hope to improve user confidence in the menu. Several users suggested that even if they could easily identify foods within their dietary restrictions, they sometimes couldn't be sure that item was still being sold or if a particular ingredient was safe for their diet. Our solution will attempt to address these anxieties.

2.3 Facilitating Social Interaction

While we expect to develop a solution that addresses users individually, users also noted that their social interactions with restaurant staff could be improved. Servers sometimes couldn't answer questions relevant to the users' dietary restrictions. Given the nearly inextricable relationship between servers and menus, our solution could also facilitate a better relationship between servers and users.

2.4 Spontaneity

Overall, our users consistently noted that they had to plan their meal outings unless they were going out to one of their regular haunts. That might be manageable when our users are at home, but if they're on vacation or pass by something more ephemeral like a food truck, that process can be much more cumbersome. Our solution will endeavor to streamline the food selection process for vegans and vegetarians so that our users can more readily make spontaneous choices with their eating habits.

03 Expected Methods

We will utilize the Design Council’s⁹ **Double Diamond** process model in this project due to its comprehensive framework that allows for divergent thinking (wide, deep, exploratory), then convergent thinking (focused action, defined problem scope) on the problem area.

The double diamond consists of **Discovery (research phase)** and **Define (synthesis phase)**, **Develop (ideation phase)**, and **Deliver (build phase)**, whereby each phase will involve various expected methods that fit the project goals at each stage.

This model allows us to first, understand, rather than assume what the problem is, define the challenge in a focused way, ideate solutions from multiple perspectives (e.g. users, stakeholders, designers), and finally, iteratively design and test - through multiple sprints - to refine our solution.

Also, this process is not linear and allows us to return to earlier stages if needed and as time permits. For example, user tests done on early prototype versions may lead back to the Discover or Define stage where we further explore new or deeper problem areas. Our intention is to constantly get feedback throughout the process, and work iteratively to ensure that our design and solutions ultimately meet our user needs.

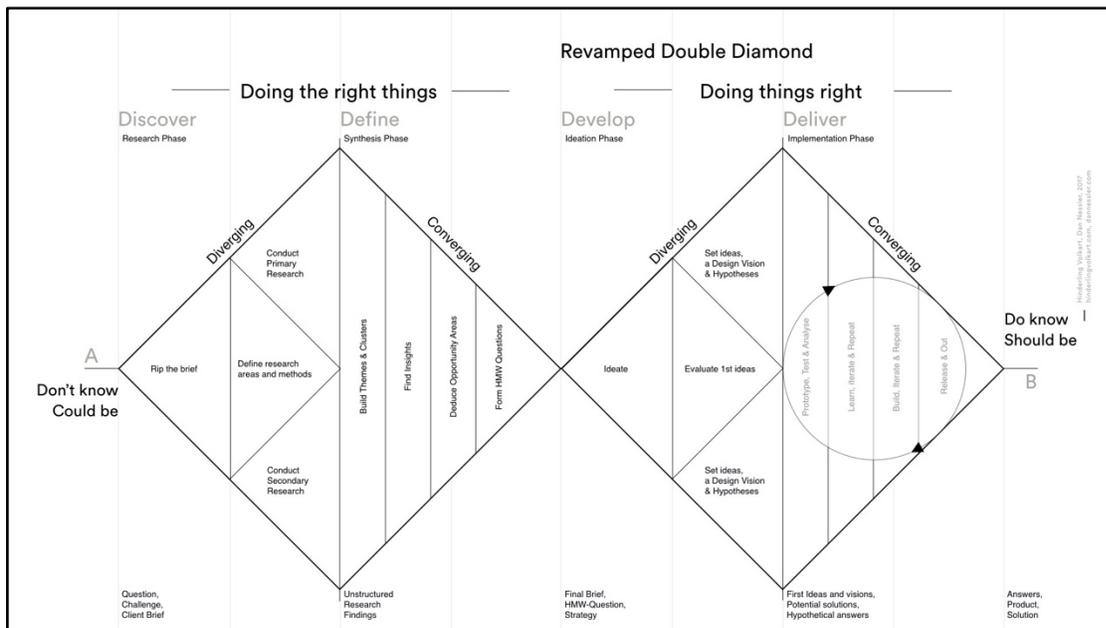


Figure 7 Design Council’s Double Diamond process model

3.1 Identifying the Problem Space

Our key focus is to develop an intuitive and reliable system that improves dining-out experiences for vegans and vegetarians who often face many barriers⁶, whether psychological, social, and/or technical. Initial findings revealed user feelings of anxiousness related to accuracy of menu, food

descriptions, and food served; we also found social anxiousness related to interacting with servers to frequently and thoroughly check if dishes and prep methods adhere to user dietary needs.

We aim for a solution that will not only alleviate the stress involved in filtering and identifying vegan and vegetarian food options, but also will build trust and transparency between restaurants and their vegan/vegetarian customers (our user group).

3.2 Discover (Research Phase)

At this stage, we seek to have a broad view and understanding of the problem landscape before identifying a focus area. Here, we will examine relevant existing systems including, but not limited to:

- literature reviews
- mobile applications
- current menu designs

In order to identify UX barriers in the general market landscape.

Additionally, we will use the 4Ws technique from Dr. Walker's slides and question:

- 'Who is experiencing the problem' (user group)
- 'What is the problem' (define scope)
- 'Where does the problem present itself'
- 'Why does solving this problem matter' (significance of problem)

This technique is intended to reveal key elements for our initial, landscape research which are the general user population, major pain points, contexts of their struggles, and the potential impact of overcoming these pain points.

We will also leverage real use experiences through 3-6 individual, semi-structured user interviews to have a broad and deeper understanding of their experiences, pain points, needs, and goals, as well as identify recurring themes or issues.

3.3 Define (Synthesis Phase)

Here, we will narrow the problem scope and dive deeper into it. We will start by synthesizing findings from the former stage and use those findings to narrow our problem scope. We will code data sets (e.g. from interview transcripts, market audit) to identify recurring and/or vital pain points or themes. Next, we will use octopus clustering and card sorting to identify clusters and priorities respectively. These methods will help us identify opportunity areas and consequently, define our problem statement.

Upon identifying our problem space, we will dive deeper into understanding our user groups. Here, we plan to leverage these methods to help us empathize with our users:

Data Gathering

- Semi-structured user and stakeholder interviews
- Digital Surveys
- 3-6 Contextual Interviews

Data Visualization, Synthesis, and Analysis

- Affinity diagram (build a research wall) and key insights
- Create user journey maps
- Build personas or archetypes
- Create user stories and scenarios

3.4 Develop (Ideation Phase)

At this stage, we will build upon findings from previous phases to generate diverse ideas to solve the problem. Our goal is to empathize with target users, understand the design implications, and refine our solutions through an iterative process.

The ideation process⁸ will consist of five phases: preliminary ideation, idea generation, enrich and deepen ideas, grouping and ranking options, and narrowing down ideas. We plan to utilize a few tools from service design methods, including, but not limited to:

- Asking “How might we...” questions based on insights, personas, and user stories
- Brainstorming and brainwriting
- Card sorting
- Affinity diagrams
- Quick voting methods such as assigning scores or priority matrices

3.5 Deliver (Build Phase)

In this phase, we will leverage all our findings from previous phases, narrow down solution ideas, and proceed to iteratively design, build, and evaluate the prototypes for 3 sprints.

3.5.1 Design + Build

Here, we will translate our ideas into concrete design solutions. In addition to expressing our ideas in words, we will visualize potential solutions via storyboarding and sketching. Then, we will develop the information architecture and map out the expected user flow.

Once we have a good sense of our design structure, we will move on to building prototypes, including low, middle, and high-fidelity. We will start with paper prototypes, wireframes in a visual software, and gradually develop an interactive prototype using digital interface design tools.

3.5.2 Evaluation of Prototypes

With low-fidelity prototypes, we will test the functionality of the system, using paper prototypes to evaluate user task success rate and user interaction. With mid-fidelity prototypes, we will test that the system clearly communicates all essential information and get user feedback on visual design; here, we plan to use A/B testing, Wizard of Oz (user interaction flow), and moderated user testing (scenario-based). With high-fidelity interactive prototype, we aim to refine issues uncovered in previous testing to get as close as possible to the final system; we plan to use moderated user testing (scenario-based), A/B testing, and interface heuristic evaluations.

We will synthesize our findings qualitatively and quantitatively according to each method and research goal; these findings will be the bases for our design decisions.

04 Expected Resources

4.1 People

Vegans and Vegetarians

We will need access to vegans and vegetarians as our user group. Thus far, we have only reached out to vegan & vegetarian Tech students via the MSHCI Slack, but to expand our sample of users.

Restaurants

We may also need to reach out to restaurants to research how they serve vegans and vegetarians. Serving staff, in particular, may be needed, as we identified them as a potential vector of improvement. We expect to reach out to these places via phone, but in-person research may be necessary.

4.2 Expertise

Georgia Tech Faculty and Staff

Georgia Tech faculty and staff, including our instructor, Professor Bruce Walker, our TAs, the professors in our other classes will be lending us their expertise.

Restaurant Employees

As we mentioned before, the specific expertise of restaurant employees may be necessary for our research.

4.3 Datasets

Online information pertaining to restaurants such as location, operating hours, and menu may be necessary for a prototype. A service like Google Maps may house this kind of information, though we expect that getting individual menus may be difficult.

4.4 Software

Microsoft Teams

We will be using Microsoft Teams to meet virtually, collaborate on submission documents, maintain our schedule, and store all records (within reasonable and ethical boundaries) pertaining to the project. Other video conferencing apps may be necessary to conduct user interviews, depending on user preferences.

Adobe Suite

We expect to employ the Adobe Suite in the process of designing these submissions any material necessary.

Miro

For ideation, journey mapping, and basic wireframing we expect to use the free online app, Miro.

4.5 Hardware

We also expect to meet in person very occasionally to better facilitate collaboration, so we anticipate using whiteboards, sticky notes, markers, and other physical effects in our ideation. If we determined that in-person testing was required, then proper protective equipment, like masks and hand sanitizer, would be essential.

05 Schedule

Project Timeline

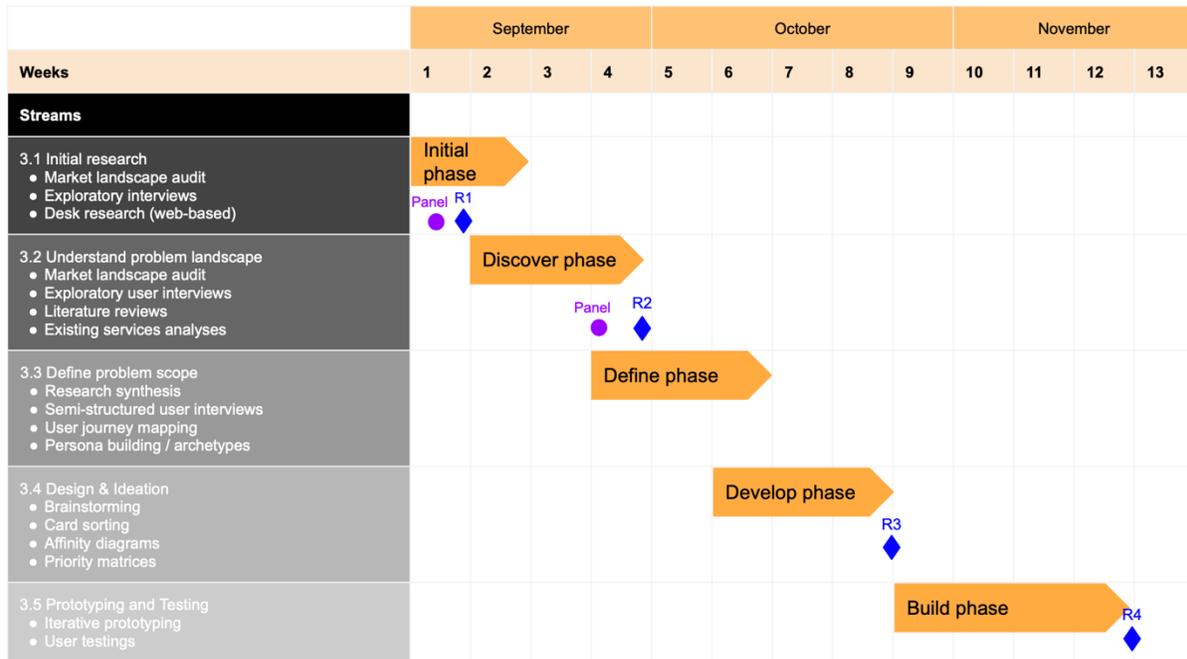


Figure 8 Team Apex Project Timeline

06 Lessons Learned

6.1 The Solution Comes Later

Our group was almost uniformly of the mindset that we ought to start thinking of a solution immediately, yet that isn't what this class called for, nor is it the quickest route to what the users need. Our job is to discover what the users need emergently by interacting with and researching them, not by throwing prototypes at the wall and seeing what sticks. Prototyping will come later, but until then, we'll need to be mindful of how quickly we jump to solutions so we can remain immersed in the exploration of our users.

6.2 Users are Where It's At

Despite the fact that we signed up for a masters program called "Human Computer Interaction" specifically for its unique focus on people, it was nonetheless surprising just how instrumental our user interviews were to the trajectory of this project. They might have been the single most informative research we conducted for this milestone. It was shrewd of us to decide on, schedule, and perform these interviews so quickly.

6.3 Division of Labor Ought to be Swift

Creating this document required a variety of actions and an abundance of interaction, and while we may have decided to conduct interviews quickly, our division of labor on the rest of the project could have been tighter. For instance, we assigned parts of this document somewhat arbitrarily. Going forward, once we decide upon our research methods, we need to rapidly assign ourselves to tasks so that the pipeline of research data to synthesis can be obvious as soon as possible and we aren't stepping on each other's toes.

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