IMPROVING THE VEGETARIAN DINING EXPERIENCE
Interview Report

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I. EXECUTIVE SUMMARY

There has been an increase in the number of applications created to help craft the dining experience. Yelp.com, for example, is a popular website that gives users extreme satisfaction when seeking information from the community about restaurants (Hicks et al., 2012). Yet, how do web based applications such as Yelp perform when trying to provide satisfaction to a subset of its users, such as in this case of vegetarians? In this project our goal is to find a better solution for vegetarians trying to find vegetarian-friendly restaurants in the U.S. Research on this project will improve the dining experience for vegetarians.

In order to obtain a proper perspective, we reviewed the current landscape on how the digital world was addressing vegetarians in general. We reviewed existing applications that target vegetarians and found two that do it well: Urbanspoon and Happy Cow. We then researched various comparable studies. After we obtained our initial findings about the current dining experience, our research question is how do users currently find vegetarian/vegan-friendly restaurants and what are their experiences dining out at these restaurants.

To answer this question, we observed five different people who are vegetarians. Through these conversations, we were able to analyze the results through the AEIOU method and make six key generalizations, such as the fact that all participants wanted to view some kind of “artifact” from the restaurant, such as photos of food or copies of the menu. We also identified one key variable among some of the observations: the website that each participant uses to filter down the results from their initial search query. From the observations that we made, we composed an interview script and conducted interviews on five different individuals to better understand their needs as a vegetarian. Four themes emerged from our findings: trust, visibility, flexibility, and inclusivity. At this point we crafted a detailed survey and invited 30 participants to help provide quantitative data to see if it verified those findings. We found that there was validation for each of these themes and with the collective research, we were able to more confidently identify design solutions for future work.

II. INTRODUCTION

A 2008 study conducted by Vegetarian Times found that 3.2% of Americans (7.3 million people) follow a vegetarian diet. An additional 10%, or 22.8 million people follow a mostly vegetarian diet (“Vegetarianism In America”). A person may choose to become a vegetarian for a variety of reasons, including the desire to be healthy, to lose weight, or to support animal rights. Many restaurants acknowledge this lifestyle choice by offering vegetarian-friendly menu options. It can be difficult, though, to uncover these menu options using current research methods such as Internet searches or restaurant finder apps. What seems to be missing in the marketplace is a way to easily locate restaurants that offer vegetarian food, either exclusively or as an option, in a single place with full details of their
location, hours, and menu. Yet, to understand the degree to which this is a concern, this study examines the vegetarian restaurant dining experience beginning from the process of finding a restaurant to decision making at the restaurant.

Existing tools that are dedicated to restaurant searches include Urbanspoon and Happy Cow. Urbanspoon is a mobile app that allows users to search by location, cuisine, and average meal price. It also includes options to search by restaurant name or proximity. The restaurant listings that get returned include average user rating, user reviews, and menus. Users can search by vegetarian cuisine, but the system only shows restaurants that cater exclusively to vegetarians. There is no ability to apply secondary filters for cuisine type, such as Italian and vegetarian. Happy Cow is also a mobile app but it only allows ability to search by proximity. The browse option includes filters for vegan, vegetarian, and vegetarian-friendly restaurants. The restaurant listings that get returned include user reviews, but no average user rating or menu is offered.

It is our desire to create a tool that allows vegetarians to find vegetarian-friendly restaurants easily. To understand more about how vegetarians currently research restaurants and how this can be improved upon, we have conducted observations, interviews and surveys of target users.

III. METHODS

In this section, we will discuss participants, recruitment tactics and analysis methods for our observations, interviews and surveys. We received informed consent from all of our observation and interview participants by presenting and requiring each of them to complete the Consent Form found in Appendix A.

Observation Methods

Participants

We observed vegetarians seeking restaurants that serve food consistent with their dietary preferences in a specific region. Each team member identified a friend, coworker, or significant other that classifies himself or herself as a vegetarian and we contacted them directly in an attempt to recruit for an observation. We established contact in person during a regular encounter or via phone or email. Our participants vary in age, gender, and dietary preference. This demographic data is included in Table 2.1. All five of our participants are currently vegetarian although some have lived as omnivores at some point in the past.
Table 2.1 Demographics of observation participants

<table>
<thead>
<tr>
<th>Participant</th>
<th>Observer</th>
<th>Gender</th>
<th>Age</th>
<th>Dietary Preference or Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant A</td>
<td>Kyle</td>
<td>F</td>
<td>27</td>
<td>Vegetarian</td>
</tr>
<tr>
<td>Participant B</td>
<td>Nithya</td>
<td>F</td>
<td>27</td>
<td>Vegetarian</td>
</tr>
<tr>
<td>Participant C</td>
<td>Parveen</td>
<td>F</td>
<td>30</td>
<td>Vegetarian</td>
</tr>
<tr>
<td>Participant D</td>
<td>Laura</td>
<td>F</td>
<td>32</td>
<td>Vegetarian</td>
</tr>
<tr>
<td>Participant E</td>
<td>Nicole</td>
<td>M</td>
<td>28</td>
<td>Vegetarian, Moderate Vegan</td>
</tr>
</tbody>
</table>

**Procedures**

We observed our participants complete a task related to seeking vegetarian-friendly dining options. Our observations varied in terms of the location, use of media, and task type. These details as well as their relationship to the observer are displayed in the table below. Four of the five participants invited us to observe them in their home using a personal computer whereas the other allowed our team member to conduct the observation in their place of work at that person's desk. In all cases, we observed our participants using at least some form of technology including personal computers, tablets, or smartphones. In one case, a participant used multiple devices simultaneously. During our observations we monitored the participants' interactions with the operating systems on their respective devices.

Table 2.2 Observation task details

<table>
<thead>
<tr>
<th>Participant</th>
<th>Observer</th>
<th>Observation Location</th>
<th>Technology Medium</th>
<th>Relationship to Observer</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant A</td>
<td>Kyle</td>
<td>Home</td>
<td>Laptop PC &amp; iPhone</td>
<td>Significant Other</td>
<td>Find vegetarian-friendly dining options for an upcoming trip to Seattle, Washington</td>
</tr>
<tr>
<td>Participant B</td>
<td>Nithya</td>
<td>Home</td>
<td>iPad &amp; iPhone</td>
<td>Friend</td>
<td>Find new, local vegetarian restaurants in Chicago</td>
</tr>
<tr>
<td>Participant C</td>
<td>Parveen</td>
<td>Home</td>
<td>Laptop PC</td>
<td>Significant Other</td>
<td>Find interesting, vegetarian-friendly dining options in Wayne, Pennsylvania where she's travelling on an upcoming business trip</td>
</tr>
<tr>
<td>Participant D</td>
<td>Laura</td>
<td>Office</td>
<td>Desktop PC</td>
<td>Co-worker</td>
<td>Find a vegetarian restaurant suitable for a nice meal out with her fiancé on the Las Vegas strip during an upcoming vacation to Nevada</td>
</tr>
<tr>
<td>Participant E</td>
<td>Nicole</td>
<td>Home</td>
<td>Laptop PC</td>
<td>Friend</td>
<td>Find a vegetarian- and vegan-friendly restaurant in the Logan Square neighborhood of Chicago to where he would like to take his vegan girlfriend out to dinner</td>
</tr>
</tbody>
</table>

**Analysis Methods**

We collected notes during our observations that we compiled using a cloud-based document that could be shared by the whole team. To simplify and arrange our observation data, we leveraged an online application called Listhings that works as a virtual bulletin
board. Using Listnings we wrote each observation and activity on the virtual sticky notes and then organized them into groups on the virtual bulletin board.

We constructed an affinity diagram (Appendix C) based on our data. The AEIOU framework, which provides guidelines for categorizing observations of participants' activities and interactions with objects within their respective environments, influenced our analysis process and diagram creation efforts. It helped to define a protocol by which to characterize our observations. We each posted sticky notes containing pieces of observation data on a faux digital cork board before arranging them into a meaningful hierarchical structure to show the natural relationships between data. A hierarchy emerged during the collective note-posting effort. Team members rearranged the notes by grouping related data and appointed higher-level categorical descriptions based on the groupings. The final diagram allowed us to effectively review and analyze our collective data set to draw useful insights about our problem space.

**Interview Methods**

We generated a qualitative research interview that is designed to gather insights into our participants' points of view regarding their processes in seeking out vegetarian dining experiences and emphasizing generality in nature. The full interview script is included in Appendix D.

**Participants**

We interviewed vegetarians willing to share their thoughts and experiences about their pursuit of vegetarian and vegan-friendly restaurants, given their dietary preferences. We each selected an individual through our respective social networks that included friends and family, and recruited them by inquiring directly during face-to-face interviews. The specifications for interview candidates is consistent with those we defined in our selection process for observation candidates, so in some cases we interviewed the same individuals. Our interviewees' demographics varied, which is detailed below in Table 2.3.

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Observer</th>
<th>Gender</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant F</td>
<td>Kyle</td>
<td>F</td>
<td>27</td>
</tr>
<tr>
<td>Participant G</td>
<td>Nithya</td>
<td>F</td>
<td>27</td>
</tr>
<tr>
<td>Participant H</td>
<td>Parveen</td>
<td>F</td>
<td>36</td>
</tr>
<tr>
<td>Participant I</td>
<td>Laura</td>
<td>F</td>
<td>32</td>
</tr>
<tr>
<td>Participant J</td>
<td>Nicole</td>
<td>F</td>
<td>28</td>
</tr>
</tbody>
</table>

*Table 2.3* Demographics of the interview participants
Procedures

We each conducted an in-person interview, most often at the participant’s home. We presented participants with a series of questions from our scripted interview and requested that they answer honestly and to the best of their ability. We took notes to record participants’ insights during all interviews. Only one of our team members used an audio recording utility on her mobile device during the interview to assist in the transcription process. Information pertaining to the logistical aspects of our interviews is displayed in Table 2.4.

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Observer</th>
<th>Observation Location</th>
<th>Relationship to Observer</th>
<th>Duration (in minutes)</th>
<th>Recording Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant F</td>
<td>Kyle</td>
<td>Home</td>
<td>Significant Other</td>
<td>22</td>
<td>Notes</td>
</tr>
<tr>
<td>Participant G</td>
<td>Nithya</td>
<td>Home</td>
<td>Friend</td>
<td>30</td>
<td>Notes</td>
</tr>
<tr>
<td>Participant H</td>
<td>Parveen</td>
<td>Office</td>
<td>Co-worker</td>
<td>20</td>
<td>Notes</td>
</tr>
<tr>
<td>Participant I</td>
<td>Laura</td>
<td>Office</td>
<td>Co-worker</td>
<td>24</td>
<td>Notes</td>
</tr>
<tr>
<td>Participant J</td>
<td>Nicole</td>
<td>Home</td>
<td>Friend</td>
<td>38</td>
<td>Audio</td>
</tr>
</tbody>
</table>

Table 2.4 Interview participant procedures details

Our interviews began with a series of warm-up questions that allowed us to gather background information about our participants and their paths to becoming vegetarians. These questions also served to put participants at ease. We moved on to a series of questions that focused on interviewees’ restaurant seeking and dining experiences. This section contained questions of both a general and specific nature. We concluded our interviews by gathering demographic information, such as age and gender. A full transcript of the interview conducted by Nicole Sciackitano is included in Appendix D.

Analysis Methods

Each group member posted their respective interview notes to a shared online document; one group member also transcribed and uploaded her complete interview. Collectively, we reviewed our interview transcriptions in order to generate a qualitative analysis.

We used an inductive approach in our analysis of the qualitative data we collected in our interviews. We reviewed the raw interview data in our notes and transcriptions to generate codes that we based on salient words, phrases, attributes and concepts. Significant and recurrent themes emerged as we identified relationships between our codes. We assembled the thematically related codes based on our interpretation of their meaning into categories and subcategories, which are displayed in the Inductive Coding Matrix in Table 2.5. Our coding framework informed our findings, further detailed in the following section. The
themes are defined in more detail in the Findings section of this document.

**Inductive Coding Matrix:**
The diagram below illustrates the coding system we used to help us analyze our interview responses. Codes in quotations are of the InVivo classification that represent direct quotes from interview transcripts.

<table>
<thead>
<tr>
<th>Themes</th>
<th>Trust</th>
<th>Visibility</th>
<th>Flexibility</th>
<th>Inclusivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;I frequent&quot;</td>
<td>restaurant website</td>
<td>&quot;compromise&quot;</td>
<td>&quot;substantial vegetarian options&quot;</td>
<td></td>
</tr>
<tr>
<td>user-generated content</td>
<td>online menu</td>
<td>control over selection</td>
<td>&quot;cater to&quot;</td>
<td></td>
</tr>
<tr>
<td>&quot;reliable source&quot;</td>
<td>reviews</td>
<td>strictness of diet</td>
<td>&quot;minority&quot;</td>
<td></td>
</tr>
<tr>
<td>perceived quality</td>
<td>&quot;I see / I have seen&quot;</td>
<td>&quot;I cook&quot;</td>
<td>&quot;do my own thing&quot;</td>
<td></td>
</tr>
<tr>
<td>restaurant suggestions/ recommendations</td>
<td>foregoing opportunity</td>
<td>accommodation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;good results&quot;</td>
<td>religious restrictions</td>
<td></td>
<td>understanding</td>
<td></td>
</tr>
<tr>
<td>accuracy</td>
<td>substitutions</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 2.5 Inductive Code Matrix*

**Survey Methods**

**Participants**
We broadened our pool of vegetarians in order to compile a larger sample size. Each member of the team went out and recruited additional people who were active vegetarians and were willing to share their experience through an online survey. We set a quota of 30 participants and were able to collect enough responses through personal referrals and thus didn’t have to scavenge through larger and more obscure sources (such as through anonymous Facebook pages). We had some non-vegetarians also manage to take the survey but we filtered out their responses in order to make sure the data was pertinent. The following graphs highlight some key demographics of the participants.

**Length of Being Vegetarian**
Figure 2.6 The amount of time for which survey participants have identified as a vegetarian

Gender Distribution

Figure 2.7 The gender distribution among survey participants

Age Distribution

Figure 2.8 The age distribution among survey participants
Racial Distribution

Figure 2.9 The racial distribution among survey participants

Procedures

The survey was conducted entirely online and at the participant’s discretion. Our team crafted a detailed survey script that started off with general basic questions and went into more specifics and then concluded with some basic demographic information. Most of the questions were set up as being optional but focused on making each multiple choice or multiple select. The survey link was then provided via email to participants (who was either known or a referral of someone we knew). All responses were kept confidential and were not shared with anyone outside this project.

Analysis Methods

The online survey tool that we used allowed us to create a quota of 30 respondents. Upon getting 30 vegetarian respondents, we utilized quantitative analysis and tabulated the results into a spreadsheet and shared the results with the group. For certain points of interest, we presented the quantitative data as graphical charts to help highlight key findings.

IV. FINDINGS

Observation Findings

Observations yielded three themes: consistent search methods, consistent research methods, and sharing search results. Each theme is founded on notable behaviors among
participants while they conducted online searches for vegetarian and/or vegetarian friendly restaurants located in a specified region. The first theme, consistent search methods, is comprised of six behaviors found among participants throughout our observations, including:

1) Most participants used the Google search engine to initiate their online search; 2) Subsequent to obtaining search results from Google, a majority of participants navigated to sites containing local restaurant reviews or “best of…” restaurant lists that were reviewed or curated by local experts. (e.g., a list of Chicago’s best vegetarian restaurants compiled by Chicagoist.com); 3) Some participants continually referred back to their initial Google search results; 4) Used restaurant-specific search engines such as Yelp, Urbanspoon, etc.; 5) Some participants simply refined the terms of their search in Google and in restaurant-specific search engines; 6) Each participant took no less than 10 minutes but no longer than 20 minutes to complete their restaurant search. The second theme, consistent research methods, is comprised of two behaviors found among participants: 1) All participants completed at least two of the five research tasks (defined later) per restaurant of interest; 2) All participants wanted to view some kind of “artifact” from the restaurant, such as photos of food or copies of the menu; 3) Every participant researched at least 3 different restaurants. Lastly, sharing search results refers to the common phenomena of participants forwarded the results of their search to dining partner(s). In the following sections, we described the three themes in detail.

**Consistent Search Methods**

Almost all participants shared common behaviors in all phases of their respective online searches (i.e., from initiating the search to targeting a restaurant of interest). First, almost all participants began the process of finding a vegetarian/vegetarian-friendly restaurant with a simple Google search. Subsequent to obtaining search results from Google, the next phase of the search for the majority of participants comprised of navigating to a site that presented a list of the best restaurants in a given area and/or reviews of local restaurants evaluated by experts (e.g., restaurant critics, chefs, etc.). For example, two participants navigated to local publications (i.e., Chicagoist.com and the Washington Post website, respectively) as a means to find local vegetarian and/or vegetarian-friendly restaurants with positive professional ratings. If the aforementioned site(s) did not yield a restaurant of interest, some participants continually referred back to their initial Google search results, working their way down the list of links until they found one that contained the desired information. Others changed their research methods significantly, moving on from their initial Google search to other, more restaurant-specific search engines such as Yelp, Urbanspoon, etc. Furthermore, some participants simply refined the terms of their search in Google and in restaurant-specific search engines. Participants narrowed down the parameters of their search by including more detailed geographic information, selecting a price range, or searching for a particular cuisine. Note, the degree to which participants’ search methods evolved this way varied significantly. Also note, each participant took no less than 10 minutes but no longer than 20 minutes to complete their restaurant search.

**Consistent Research Methods**
Once participants targeted a restaurant of interest, research about the restaurant of interest commenced. Based on our observations, we define the research phase of participants' searches by the completion of at least two of the following tasks per restaurant of interest: (1) read a restaurant description, (2) scanned restaurant summary (such summaries typically include information like price range, level of formality, hours, and location), (3) viewed photos, (4) scanned the menu, and (5) read a customer review. The most notable aspect of research methods among participants was that all participants wanted to view some kind of “artifact” from the restaurant, such as photos of food or copies of the menu. Moreover, every participant researched at least three different restaurants.

**Sharing Search Results**

At the conclusion of the search, we observed multiple participants forward information about the chosen vegetarian/vegetarian-friendly restaurant to dining partner(s). Methods of sharing restaurant information were consistent among participants. Multiple participants sent their search result to dining partner(s) via e-mail.

**Sequence Model Diagram:**
This diagram illustrates one possible task sequence according to our observation findings.
Interview Report - Improving the Vegetarian Dining Experience

Figure 3.1 Sequence Model Diagram

Interview Findings

Four themes emerged from the five interviews with vegetarians: Visibility, Flexibility, Trust and Inclusivity. The following sections describe each in detail.

Visibility

All participants (N=5) discussed the notion of visibility, or the extent to which an online source provided visible restaurant artifacts such as photos of food and/or a copy of the menu. All participants relied on the visibility of the menu and/or photos of food in order to determine whether or not the restaurant under consideration was a viable dining option. For instance, when participants were asked what level of importance he or she placed on having access to a given restaurant’s full menu during an online search, one participant responded “Very Important. I want to see my choices before I go [to the restaurant].” Regardless of the online source, whether it be a mobile application, Urbanspoon, Yelp, or restaurant website, all participants considered it to be important that they be able to visualize the options beforehand. These options could be presented through photographs of the food or by examining a copy of the menu.

Flexibility

The vegetarians we interviewed were differed in how flexible they could be when dining with non-vegetarians. When participants were asked about how they deal with dining with non-vegetarians, several participants (N=3) emphasized that when decisions about dining locations happen, they try to be flexible and that they are often willing to go to restaurants that present few “viable” or “substantial” vegetarian options. The participants indicated a tendency to be more flexible or make concessions (i.e. “compromise”, “come to a consensus”) when deciding where to dine with non-vegetarian companions. On the other hand, two participants expressed their distaste for compromise, both insisting that if their needs as vegetarians were not given primacy in the decision making process, then they would opt-out of dining-out entirely. For example, participants were asked whether or not they had experienced difficulty selecting a restaurant because of conflicting dietary needs or preferences among his or her dining companions, one participant responded, “Yes, all the time. Friends often want to go to places that don’t cater to vegetarians’ needs. When that happens I often forego dining with them and if I’m still looking to hang out then we’ll meet up after.”

Trust

Most participants (N=4) mentioned the idea of trust, or the extent to which a source of restaurant information provided “helpful”, “accurate”, and/or reliable information about a restaurant, when searching for new restaurants. When searching for new places to eat, most
participants trusted recommendations from close acquaintances, professional write-ups, and mobile applications as well as websites specific to restaurant discovery. We asked the participants to indicate which discovery method yields the best results. One participant indicated “I can usually depend on recommendations from friends...Talking with friends, whose tastes are similar to my own, I trust the most.” Conversely, some participants found customer reviews and ratings featured on websites such as Urbanspoon and Yelp “scattered,” “distracting,” “unreliable,” “annoying,” and “not very accurate.”

**Inclusivity**

All participants (N=5) placed value in the degree to which restaurants seemed to display an inclusive mindset toward their vegetarian customers, that is, the extent to which a restaurant’s menu not only serves “good” and “substantial” vegetarian options, but the degree to which meat-free dishes seem to be integrated into the overall menu. The participants expressed appreciation for restaurants that served more than just a couple of standard vegetarian dishes, preferring restaurants that include vegetarian dishes throughout all parts of the menu and at multiple price-points. To give an instructive example, participants were asked to describe what they thought constitutes a vegetarian-friendly restaurant, one participant responded, “It’s about incorporating vegetarian options within a cuisine, with as much thought and effort given to vegetarian options as is given to non-vegetarian options.”

**Survey Findings**

We surveyed 30 online participants who considered themselves to be somewhere on the vegetarian scale and collected and quantitatively analyzed their responses. The purpose of this step was to validate the findings found in the qualitative measures done through observation and interviews and the results are as follows:

**Visibility**

The survey corroborated the feedback from interviews in that actually viewing the menu was the most important function of identifying vegetarian options. Of the respondents, 76% (N=23) of which rated the menu itself the most important factor when researching restaurants. And the results added some additional detail not found in the interview in that a simple menu is not sufficient enough. The results showed that an overwhelming 90% (N=27) of respondents check to make sure all ingredients in a dish are vegetarian before they order. Many menus do not list out their ingredients and thus diners have to ask a waiter to verify.

**Flexibility**

Survey data also confirmed the findings from interviews in that most people are fairly open minded when dining with others. They may have adapted this mentality due to circumstances as 73% of respondents (N=22) noted that they end up eating at restaurants
that cater more to non-vegetarians. There were no responses that stated that they “never have any issues” when finding dining options when out with others. The correlation in these two responses would imply that flexibility is a result of surviving tactics when dining out and not a natural innate trait of this sample.

\textit{Trust}

Trust was for the most part a cornerstone for how participants found new restaurants. The most popular choice for how they found restaurant options were through personal recommendations (N=25). Getting recommendations from personal referral will be key as it allows vegetarians to make sure there overall experience will fit with their beliefs. This can be seen through the responses on a very similar question. When asked how easy it was to find restaurants that cater to vegetarians, majority of responses said that it was either a neutral experience (N=9) or somewhat difficult (N=9). This is in opposition to those who said it was easy (N=1) or somewhat easy (N=6). Given these findings, it seems to add extra weight to the opinion that diners can get from people they know.

\textit{Inclusivity}

Inclusivity is important in that most respondents (N=20) desired vegetarian options in all parts of the menu. Usually this would probably only be present if the restaurant itself had a focus on appealing to vegetarians. Some of the comments that were included with questions relating to inclusivity expressed frustrations found at dining at mainstream establishments. These comments consisted of statements like “I have to tell to get something without meat and egg” or “salad or pasta are my only options”. This can also be correlated with the finding presented earlier where majority of respondents found it neutral or difficult to find restaurants that catered to vegetarianism. After reviewing the results, inclusivity could be delved into more detail with additional research as the survey did not include a sufficient number of questions specifically tied to this theme.

\textit{Personas}

Based on aggregate findings and encounters with various user types through our observations, interviews, and surveys, we defined a series of persona spectrums to inform our three personas, or potential user types for the product for which our research aims to inform. The spectrums are Technical Proficiency, Attitude Toward Technology, Adaptability or Flexibility, which can be related to willingness to experience the unknown, Mobility or Frequency of Travel, Dietary Strictness in terms of vegetarianism, and Frequency of Dining-Out. We applied our fictional characters along each spectrum in such a way that we generated the necessary diversity representative of different segments of our expected user population. By adopting this process we ensured that all user groups and behaviors were considered in the persona creation process. The persona spectrum can be found in Appendix E.
Our personas are briefly described below and in greater detail in the persona diagrams that follow in Figures 3.2 - 3.4.

“The Health-Conscious Teacher”
Nina Jansen (Figure 3.2) is a teacher living in the Chicago suburbs who is new to the area and is married to a non-vegetarian. They typically cook at home, which gives them the flexibility to design meals that will please them both, however they do enjoy dining out at least once per week. She identifies as a strict vegan in the sense that she stands against consuming animal products, however every once and a while she’ll indulge in a clothing item or accessory created from an animal by-product.

“The Travelin’ Man”
Hank Fredrichs (Figure 3.4) is a talented barber and musician who spends a lot of time on the road performing and ends up eating out exclusively when doing so. Henry is a “middle-of-the-road” vegetarian but finds that with regard to his diet, he must be flexible at times due to the common constraints of traveling. As such, most of his meals end up at restaurants chosen by others and he isn’t always able to find the desired substantial vegetarian options he’d like. Hank does have a sincere yet infrequent desire for bacon but he rarely allows himself to indulge, however from time to time this will impact his decision making when dining, whether it is on the road or at home. He still considers himself vegetarian since majority of his meals are in fact without meat.

“The Tech-Savvy Career Woman”
Meera Narayan (Figure 3.3) is a software engineer in Silicon Valley who uses dining as a social and networking experience with her boyfriend and co-workers. She is a more lenient vegetarian but does her best to adhere to the constraints imposed by her culture. Dining out for her is a key outlet of her social life and thus ends up sharing company with many non-vegetarians in more meat-friendly environments. She is interested in staying close to her cultural roots and does not have an interest in animal-based foods but occasionally will go against her ways in order to go with the flow.
**Personas**

**Persona 1: “The Health-Conscious Teacher”**

**Name:** Nina Jansen  
**Age:** 31  
**Location:** Chicago, IL  
**Occupation:** Teacher

**Goals**
- Spread knowledge and positivity through education  
- Avoid animal by-products as best as possible  
- Explore her relatively new city and region

**Background**

Nina Jansen is a teacher for a third grade class at a private school in the north suburbs of Chicago. She’s 31 and recently married to a Dutch expat. They live together in a 2 bedroom apartment in the Lincoln Park neighborhood from which she commutes by car every day. They don’t have a great deal of family members or friends beyond their work circles because they’ve only lived in the area for a few years. They relocated from the Netherlands, where they spent three years together, for her husband’s job in supply logistics for an international construction company.

She uses a desktop with Windows 7 sparingly throughout the day. It’s mainly used for daily class management activities and for generating class materials but she also uses it for recreational activities like email on occasion. At home she often uses her iPad to access recreational content and her Kindle for reading, which she keeps with her at all times. Her husband has a Macbook Air, which she uses infrequently.

Nina is a strict vegetarian and a vegan, although she considers herself a “freegan” because she will consume the occasional milk chocolate bar, eat ice cream, and still wears a few leather and wool garments. For the most part, however, she does her best to avoid products of animal origin. Nina’s husband will eat anything but has adopted a generally vegetarian diet as a result of their shared pantry and what he’s picked up from her eating habits. He’s not afraid to dig into a hearty steak every once and a while. Together they cook nearly every day of the week and do a good job keeping their refrigerator stocked. When they do dine out, they frequent their few favorite restaurants, where they both know they’ll eat well. Occasionally, they’ll venture out for date night at a new place.

**Key Characteristics**
- Strict vegetarian and “freegan” vegan  
- Reads 1 book for recreation a month  
- Dines out about 2-3 times per week, usually twice for lunch and once with her husband  
- Considers herself middle of the road in terms of tech savviness because she’s often on her two different tablets  
- Uses a few select go-to apps to seek out dining options

**Quote**

“I couldn’t live without my tablets (iPad and Kindle). They carry me through the day, into the depths of a good book, and to restaurants that will understand when I specify what I will and won’t eat.”

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**Figure 3.2** Persona 1: “The Health-Conscious Teacher”
“A TECH-SAVVY CAREER WOMAN”

Name: Meera Narayan  
Age: 40  
Location: Palo Alto, CA  
Occupation: Software Engineer

Goals

- Utilize the latest technology to easily spot places with desirable vegetarian options in locations close to where she works and lives
- Share dining experiences with fellow co-workers and friends so they can try all the latest cutting-edge restaurant experiences

Background

Meera is a software engineer for a major bank situated in the financial district in San Francisco. She is not married and doesn’t have any children but does have a boyfriend, whom she has been dating for 3 years now after meeting at a previous job. She lives in a small condo near downtown Palo Alto where she can walk and enjoy the small town nightlife. She immigrated to the San Francisco Bay Area with her parents from India when she was only 3 years old and has spent the rest of her life in this area. She considers it her true home and never desires to move elsewhere, yet she always makes sure to use some vacation time to travel as she loves exploring other cultures.

Like many technophiles, Meera has multiple devices constantly laying around. She has a Dell Windows 7 laptop that she travels with during her commute into San Francisco on the Caltrain. She prefers not to use Windows but is forced to due to security regulations at the bank. At home, she has the new MacBook Pro with a Retina display and loves hopping on there for surfing and watching movies when she is at home. In addition to these, she has the Samsung Galaxy S3 smartphone for making calls and using the Internet on the go. Her boyfriend has an iPad that she borrows on occasion.

Meera’s heritage is from South India and thus her family is pure vegetarian. Growing up in America, she has felt societal pressure to expand into animal products but at the same time values the religious belief that eating animals is bad for the soul. Yet because she has not grown up around so many non-vegetarians, she is much more accepting and tolerant of different cuisines. Her boyfriend, who is White, is not vegetarian and is free to eat and cook whatever he wants around her. Because of the residual impact of being around other meat eaters, Meera has taken bites of their dishes on occasion. She can see the appeal but also doesn’t want to disappoint her parents or her culture.

Nonetheless, she is not very picky about restaurants in general and is accepting of going to whatever works for her boyfriend or his friends. She finds that in the area where she lives and works, there are enough vegetarian options that she never feels unsatisfied. She normally eats out 4-5 times a week as she works long hours and never finds enough time to make a proper meal. But she enjoys the company of being with friends and co-workers and usually prefers to join in if they are going out to a restaurant. She uses standard applications such as Google, Yelp, and local blogs for finding interesting restaurants. She also is on the invite list to many new startups that are focused on food discovery but really doesn’t feel married to any one application, as nothing truly solves all her needs.

Key Characteristics

- Semi-strict vegetarian, although open to testing a dish with meat products in it
- Somewhat religious and it drives her desire to maintain being vegetarian
- Dines out 4-5 times a week, usually with friends and co-workers
- Extremely tech savvy and stays on top of the latest trends
- Uses standard apps for finding eating options but is left wanting more

Quote

“I live and breath tech through my job and my career and I love every second of it. I use technology as a part of everything I do and eating is no different. I have a lot of exciting co-workers and friends and the dining experience is a chance to really build your social circle.”

Figure 3.3 Persona 2: “The Tech-Savvy Career Woman”
THE TRAVELIN’ MAN

Name: Henry “Hank” Fredrichs
Age: 33
Location: Austin, TX
Occupation: Barber / Musician

Goals
- Keep fans and potential band connections up to date
- Indulge himself in his core interests as much and often as possible
- Maintain a responsible, healthy lifestyle despite the challenges of the road

Background
Hank Fredrichs works four days a week at a barbershop owned by a childhood friend in Austin, TX. Hank’s work schedule affords him a fair amount of flexibility so that he can focus on his music career. He spends most nights writing music, practicing, or playing gigs with his band, The Rats. Two years ago, The Rats released a full-length record as well as an E.P. Since the release of their record, Hank and his band have spent months at a time touring the US and Canada, spending almost as much time on the road as they have at home in Austin. The Rats have gone from being a stalwart of Austin’s burgeoning psych-garage scene to an up-and-coming nationally known act.

Hank uses his Windows Phone for every imaginable task – he’ll tell you that he’d be completely lost without a mobile device. Whether he is using his phone to call and text with friends, family, and booking agents, or to update his band’s social media profiles and browse the web, his phone is with him any time he’s not on stage. He has a Macbook Pro and he uses it recreationally to e-mail, check his social media accounts, and browse the internet while at home or on the road.

Hank was a vegan for 5 years, until the challenge of reconciling his dietary needs with the demands of life on the road made veganism untenable. Facing challenges in maintaining his vegan diet while touring the country with his band, Hank made the switch to an ovo-lacto vegetarian diet about two years ago. In addition to traditional vegetarian food he eats eggs and dairy products, and every now and again when nobody is looking, he indulges in his favorite food, bacon. These more permissive dietary rules have allowed him the freedom to more fully explore the food-scapes of the cities he visits while on tour. When he’s not touring, Hank prefers to prepare meals at home with his girlfriend and their roommate, both of whom are vegetarians.

Key Characteristics
- Ovo-lacto vegetarian with a penchant for bacon
- Can play five instruments: piano, bass guitar, drums, electric violin, and sitar
- Dines out about 2-3 times per week, when he’s in Austin. He dines out for nearly every meal when touring with his band
- Tech savvy, spends 3-4 hours online every day
- Uses a couple mobile phone applications to discover good vegetarian eats located when he’s on tour

Quote
“Anyone who knows me knows that I have three great passions: my food, my music, and my friends. Central to connecting to all three is my phone – no matter where I am or what I’m doing I know that my phone can act as an instant portal to the things I love.”

Figure 3.4 Persona 3: “The Travelin’ Man”
Scenarios

We established a series of scenarios, each featuring a user archetype defined in our personas, in order to frame a likely situation that a user might find him- or herself in and how that person would react. We hoped to effectively portray a certain level of interaction with a product similar to one that we anticipate designing as a result of our research. The first scenario features an archetypal user similar to our persona, Nina.

Scenario 1

In this scenario, Kate Lewis, a strict-vegetarian like our “Health-Conscious Teacher,” is trying to plan a birthday party for her husband who is a non-vegetarian. It describes how she uses the new vegetarian dining experience app after getting frustrated looking online to find a restaurant that caters to her family and friends who comprise of both vegetarians and non-vegetarians.

Kate Lewis and her husband, Martin Lewis, had just moved to one of the suburbs in Illinois for work. Kate was a strict vegetarian, while Martin did not have any dietary restrictions. They both loved cooking; therefore, they cooked at home almost every day. On occasion they would dine out. Soon after they moved, a friend who they had met and was a vegetarian told them about a restaurant that provided ample amount of food for both vegetarians and non-vegetarians. This place became their favorite spot to dine out.

However, one day when they were driving by, they noticed that their favorite restaurant had a sign in front that said the restaurant had been shut down. Kate had planned to throw Martin a surprise birthday party at this restaurant and now she had to find something new that would satisfy both their dietary needs.

She opened up a browser on her iPad to search online for restaurants. She found a list of multiple restaurants in her area and in the city, but most of them did not offer many vegetarian options and some were very hard to navigate and find the menu. There were so many that it was time consuming to go through each menu. She decided to download an app that a friend had told her about that found vegetarian and vegan friendly restaurants in any place you searched. She opened the app and searched in her area for restaurants. Multiple restaurants were listed just as it did on the online search engine; however, this time the list showed each restaurant’s ratings, reviews, menus and most importantly it highlighted the vegetarian options offered, which made it easy to read what the restaurants provided. She found one of the highest rated restaurants and looked through their menu. All parts of the menu had at least two vegetarian options. She was happy with what she found. She called the restaurant using the number she found on the app, and made a reservation. The day of the party finally came and her husband and her friends were all satisfied with the restaurant that Kate had selected for the event.
Scenario 2

This scenario describes how Uma Gupta, who has circumstances similar to our “Tech Savvy Career Woman,” uses the new vegetarian dining experience app on her mobile phone to convince the executive members of the company to go to a restaurant that offers multiple vegetarian choices without giving an impression that she was inflexible and not versatile in her dietary needs.

Uma Gupta had been working for a multinational consulting firm, for the past eight years in New York. After eight years of working long hours and putting strenuous effort into her work, she finally landed herself in a position where she can prove her mastered skills and get the senior position she had always dreamed of. During the summer, she was required to travel to San Francisco to present one of her projects at a conference where the executives of the company would be attending. Although she was very nervous, she powered through the presentation successfully and was congratulated by the VP of the company. She was invited to have dinner with the VP and a few of the executives that night. However, she had a dilemma. She was a vegetarian and they wanted to go to a five-star restaurant where she was afraid she would not have any vegetarian options other than salad.

She was a pure vegetarian like her parents due to religious beliefs. One of her biggest struggles working for the firm was when she had to travel and dine with clients. The client usually took her out to eat to the best restaurant in town, and she was obliged to go wherever they took her, even if the restaurant did not serve many vegetarian dishes. She could not complain because she wanted to keep her business etiquette no matter what the circumstance.

When the VP and executives at the conference in San Francisco invited her out to dine with them, she accepted even though she feared what they would think of her if she did not order one of the main courses, which would most likely be a meat dish. When she got a few minutes to herself, she opened up a new app that she had downloaded a few days ago on her Samsung Galaxy S3. She searched for the name of the restaurant where her superiors wanted to go. She was able to view the menu, ratings and reviews by critics and customers, and view pictures of the dishes. Just as she predicted, they only had one vegetarian side dish option. She knew it was bad etiquette to show that she was not enthusiastic about the food served at the restaurant, especially when the VP was treating her. She needed another solution. She quickly searched on the same app for five star restaurants nearby. She was able to filter her search to include at least 3-4 vegetarian options on the menu. The app pulled up a five-star restaurant few blocks away from the venue where they had the conference. It was closer to them than the other restaurant that they were planning to go to. She quickly skimmed over the menu, reviews and information about the restaurant and was satisfied with what she read. After a few minutes she was back in conversation with a few of the executive members including the VP. She expertly turned the conversation towards well-known restaurants in the area and quickly convinced them that the restaurant that she found using the app was highly notable and she had heard great things about the food and service. Soon afterwards
she convinced everyone that they should go to this restaurant instead. At the restaurant, she was immensely satisfied with her food options and her superiors were impressed with her choice in cuisine. She was able to converse without worrying and feeling self-conscious about the food that she ordered. Overall, the whole trip was a great success.

**Scenario 3**

*In this scenario, Ryan Irving travels a lot for his career like our “Travelin’ Man.” He used to be a vegan but his travels made it hard for him to find vegan restaurants and he eventually had to switch to a ovo-lacto vegetarian. This scenario describes how he uses the vegetarian dining experience app to find a restaurant that serves vegetarian options in a small town he travels to.*

Ryan Irving, a well-known photographer, traveled a lot for his job. He was constantly on the road traveling all over the nation taking pictures, from small towns to big cities to rural villages in the US. Since he was hardly home most of the year, he was forced to eat at restaurants for almost every meal. He did not mind this since he enjoyed trying new cuisines. The only setback was, he was a vegan. For almost two years into his successful career, he tried to stay a vegan while traveling. However, he found it very difficult to find vegan friendly restaurants every place he traveled to. Therefore, he made the tough decision to switch to an ovo-lacto vegetarian, where in addition to vegetarian food he eats eggs and dairy products. At times, he would even try taking a bite of a meat product if it was offered to him to respect the people and culture he was photographing.

He usually got recommendations to try new restaurants from friends and people who he meets on his travels. One time he traveled to a small village near Austin, Texas. It was a very scenic place with a lot of small local shops and restaurants. While he was photographing a few cowboys in a local horse ranch, he started a discussion with the folks at the ranch about restaurants in the area. He explained that he was a vegetarian, but they told him that he would not be able to find many restaurants in the area that serve vegetarian dishes. On his way back to the cottage he was renting, he took out his Windows phone, which he constantly uses for numerous tasks. He had recently downloaded an app that finds restaurants that served vegetarian options in the area that he specifies. He opened the app and searched for restaurants in the small village he was in. There was only one restaurant that appeared in the search results and only one review. To his surprise however, the review was very helpful. The reviewer had also tried searching for restaurants in the area but did not succeed; however, she was lucky enough to stop at this small restaurant where the chef, who was also the owner, was nice enough to make anything on the menu vegetarian and made it exactly the way she wanted it. Ryan decided to give it a try.

He used the app to get the address of the restaurant and he put it into his GPS on his phone. He was able to find the restaurant quickly. When he walked into the small dimly lit restaurant there were a few people dining. He took a seat and a waiter came to take his order.
He explained to the waiter that he was a vegetarian and that he had read a review that the chef would make anything on the menu vegetarian. The waiter smiled and told him to wait and went into the backroom. A few minutes later, the chef came out and started asking him questions about his dietary needs. The chef made exactly what he asked for and he found it very delicious. Ryan went to this restaurant every day during the week he was in the village.

**Priority Matrix**

Based on our findings, we created a priority matrix for a possible solution. In this, we have only prioritized the user experience priorities as we have not engaged in the business or technical discovery process.

<table>
<thead>
<tr>
<th>Task</th>
<th>User Experience Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Search by restaurant name</td>
<td>1</td>
</tr>
<tr>
<td>Search by cuisine type</td>
<td>3</td>
</tr>
<tr>
<td>Search by location</td>
<td>3</td>
</tr>
<tr>
<td>Filter by cuisine type</td>
<td>3</td>
</tr>
<tr>
<td>Filter by location</td>
<td>3</td>
</tr>
<tr>
<td>View hours of operation</td>
<td>3</td>
</tr>
<tr>
<td>View address</td>
<td>3</td>
</tr>
<tr>
<td>Ability to view map or get directions</td>
<td>2</td>
</tr>
<tr>
<td>Access restaurant’s website</td>
<td>1</td>
</tr>
<tr>
<td>View photos of food</td>
<td>3</td>
</tr>
<tr>
<td>View photos of restaurant</td>
<td>1</td>
</tr>
<tr>
<td>View menu</td>
<td>3</td>
</tr>
<tr>
<td>View prices</td>
<td>2</td>
</tr>
<tr>
<td>Determine level of vegetarian-friendliness</td>
<td>2</td>
</tr>
<tr>
<td>Share with a friend</td>
<td>1</td>
</tr>
<tr>
<td>Read customer reviews</td>
<td>1</td>
</tr>
<tr>
<td>Read critic reviews</td>
<td>1</td>
</tr>
</tbody>
</table>
1 = Low priority  
2 = Medium priority  
3 = High priority  

V. DISCUSSION AND CONCLUSIONS  

User satisfaction with web based services increases greatly when the information is most worthwhile to them (Khalifa, 2003). Thus, with the dearth of services targeted specifically towards vegetarians, we found that how users find such worthwhile information is complex. The aim of our research is to inform design solutions that provide vegetarians with a means to easily discover dining options that cater to their dietary preferences. We define substantial vegetarian dishes as full meals, not merely sides or appetizers, which vegetarians typically default to at restaurants without substantial vegetarian dishes.

In our observations and interviews, we found that vegetarians almost always use web-based search tools to find restaurants in a location of interest. We observed a typical search pattern among participants, that is, vegetarians typically begin their search on Google, followed by reading local expert reviews, or navigating to search engines specifically for restaurants such as Yelp, Urbanspoon, etc. We addressed this issue in our survey by asking vegetarians how they typically find new restaurants. Responses to this question indicate that many vegetarians depend upon online resources to find new restaurants, including internet searches, internet recommendations featured in blogs, restaurant finder websites and mobile apps from companies such as Yelp or Urbanspoon. Based on these findings, one possible solution is a web-based search tool, an application that can be accessed via a desktop, laptop, mobile phone, and tablet. Based on our research findings, we segmented design implications for such a solution in relation to usability goals: 1.) Efficiency, 2.) Visibility, 3.) Reliability.

A. Efficiency: Location-based Search, Search Filters, and Allowing for Accessibility from Different Internet-enabled Devices

Through our observations, we found that many vegetarians found food-specific search engines, such as Yelp or Urbanspoon, particularly helpful because they could refine their search results by location, type of cuisine, price range, and key words such as “vegan” or “vegetarian”. The solution design should have a search refinement mechanism similar to those implemented on food-specific search engines but in addition take it one step further. For example, current food-specific engines enable the filtering of search results by keywords, location and proximity, cuisine, and restaurant ratings, etc. Our design solution would incorporate the ability to filter restaurants by the number of vegetarian options on the menu.

Furthermore, the results of our observations, interviews, and survey show that
vegetarians use a variety of internet-enabled devices when conducting their searches, including tablets, mobile phones, laptops, and desktop computers. These findings suggest the solution should be designed to allow users to access the solution, a web-based search tool, from different types of internet-enabled devices. This web-based tool will be available as a web app and a native app for both desktop and mobile devices.

B. Visibility: Visible Restaurant Artifacts and Highlighted Vegetarian Menu Items

It is important to note that vegetarians are innately conscientious about their diets. In our observations and interviews, we found that all participants wanted to view restaurant artifacts such as the menu, photos of food, link to the restaurant website, etc. to determine whether or not a restaurant of interest served vegetarian options. This finding was also corroborated in our survey results. Our user research highlighted that food-based search engines label restaurants as being vegetarian at a very macro level, when the restaurant intentionally promotes itself as vegetarian-friendly. Survey results highlighted that vegetarian diners tend to dine more often at restaurants that are not catered to vegetarians. Thus a key solution that would be highly beneficial, as stated above, is the ability to filter restaurants by the number of vegetarian options on their menus.

Related to this fact, our survey results showed that participants ranked the menu as the most important restaurant artifact they want to be able to access when researching a restaurant. Furthermore, it was well demonstrated in our observations, interviews, and surveys that vegetarians strongly preferred to dine at restaurants that had multiple vegetarian options on all sections of a menu. Vegetarians heavily depend upon reviewing restaurant menu items to determine whether or not to dine there. Providing vegetarians with easy access to desired menu items (i.e., dishes that do not violate their dietary restrictions) would make the discovery process more meaningful and efficient. Thus, the solution should display search results that not only include pertinent restaurant information, (i.e., location, cuisine, price-range, photos, link to restaurant website, etc.) but also highlights vegetarian, vegetarian-friendly, and/or vegan menu items. This should enable them to more comfortably dine with non-vegetarians as they can make choices without affecting the choices of their companions.

C. Reliability: Reliable Restaurant Recommendations

This is related to the theme of Trust in our interview and survey findings. In our observations, interviews, and surveys, participants tended to trust personal recommendations from acquaintances rather than ratings generated by users of food-specific search tool such as Yelp and Urbanspoon. The fact that users overwhelmingly preferred personal referrals should imply that there is no true automated system that can accommodate the wide range of vegetarianism that exists. One design element that should be implemented is detailed documentation of the different levels of vegetarianism that exist. This ensures that the terms
used to describe different restaurants are consistently used and understood across all restaurants and thus allow users to be more confident in the information.

Another key element that should be noted from the survey results is that even when participants found a restaurant and a dish they could eat, they felt the need to verify with someone on the staff that the dish was indeed fitting their diet. For example, a vegetarian dish could be made with supplies that touch animal products or uses some animal based ingredients (such as chicken stock or fish oil). Because of this, diners need to investigate further with a restaurant staff member. This implies a trust in the wait staff that they know how a dish was prepared and that they can steer them in the right direction. Design solutions that should be incorporated to aid in building trust here would be a crowd-sourced verification system that enables diners to approve or disapprove a dish’s vegetarian nature on the menu. This would be different than voting on the taste of the dish since it would be a metric solely about whether it violated the labels that were already in place. Vegetarians would likely place some trust in vegetarians who have dined at a place previously and thus the more data that is collected, the more confident they can become. In addition to this solution, the application could specifically highlight menus that list details on how the dish is prepared or what the ingredients are contained.

**Future Work**

A key next step for this project is to further quantify the data collected in the survey results. Additional analysis and additional responses will help further cement design direction that should be taken. In addition, incorporating an even wider range of vegetarianism on the scale will be beneficial to uncovering additional features that should be identified as part of the finished product. After this additional research, it would be wise to start doing initial design mockups of the eventual application and compiling feedback from past survey and interview respondents to validate the design solution taken.
VI. CITATIONS


APPENDIX

APPENDIX A: CONSENT FORM

ADULT CONSENT TO PARTICIPATE IN RESEARCH

Vegetarian Dining Experience Study

Principal Investigators: Parveen Jagajeevan, Nithya Madhavan, Kyle Penn, Laura Schroeder, and Nicole Sciackitano, graduate students

Institution: DePaul University, Chicago, Illinois, USA
Department (School, College): CDM Human-Computer Interaction
Faculty Advisor: Sheena Erete

What is the purpose of this research?
We are asking you to be in a research study because we are trying to learn more about how people search for restaurants. This study is being conducted by Parveen Jagajeevan, Nithya Madhavan, Kyle Penn, Laura Schroeder, and Nicole Sciackitano, graduate students at DePaul University as a requirement to obtain their Masters degree. This research is being supervised by their faculty advisor, Sheena Erete.

What is involved in being in the research study?
If you agree to be in this study, being in the research involves answering a few personal questions concerning your age and gender. You will also be asked more specific questions about your restaurant search habits.

How much time will this take?
This study will take about 30-45 minutes of your time.

Are there any risks involved in participating in this study?
Being in this study does not involve any risks other than what you would encounter in daily life.

Are there any benefits to participating in this study?
You will not personally benefit from being in this study. The information you provide during this observation will help us gain a better understanding of people’s file storage habits.

Can you decide not to participate?
Your participation is voluntary, which means you can choose not to participate. There will be no negative consequences, penalties, or loss of benefits if you decide not to participate or change your mind later and withdraw from the research after you begin participating.

Who will see my study information and how will the confidentiality of the information collected for the research be protected?
The research records will be kept and stored securely. Your information will be combined with information from other people taking part in the study. When we write about the study or publish a paper to share the research with other researchers, we will write about the combined information we have gathered. We will not include your name or any information that will directly identify you. We will make every effort to prevent anyone who is not on the research team from knowing that you gave us information, or what that information is. However, some people might review or copy our records that may identify you in order to make sure we are following the required rules, laws, and regulations. For example, the DePaul University
Institutional Review Board, may review your information. If they look at our records, they will keep your information confidential.

Any audio or video recordings will be kept until accurate written notes have been made, then they will be destroyed.

**Who should be contacted for more information about the research?**
Before you decide whether to accept this invitation to take part in the study, please ask any questions that might come to mind now. Later, if you have questions, suggestions, concerns, or complaints about the study or you want to get additional information or provide input about this research, you can contact the researcher, Laura Schroeder at lschroed2@gmail.com or (214) 549-1935.

This research has been reviewed and approved by the DePaul Institutional Review Board (IRB). If you have questions about your rights as a research subject you may contact Susan Loess-Perez, DePaul University’s Director of Research Compliance, in the Office of Research Services at 312-362-7593 or by email at sloesspe@depaul.edu.

You may also contact DePaul’s Office of Research Services if:
- Your questions, concerns, or complaints are not being answered by the research team.
- You cannot reach the research team.
- You want to talk to someone besides the research team.

**You will be given a copy of this information to keep for your records.**

**First, check the box below about the audio and video recordings:**

___ I authorize DePaul University to take audio and video recordings of me during interviews in connection with this research study. The recordings will be destroyed within five years after the research study is completed.

**Second, check one of the boxes below:**

I have read the above information. I have all my questions answered. (Check one:)

___ I consent to be in this study.    ___ I **DO NOT** consent to be in this study.

Signature:______________________________________________    Date:_________________

Printed name:_________________________________________
APPENDIX B: SAMPLE WRITTEN OBSERVATION

Participant is a co-worker of mine. She is going to Las Vegas with her fiance in a couple weeks. She is a vegetarian, he is not. She wants to find a nice restaurant to go to on the Vegas Strip.

Environment: At work, sitting at her desk using her work PC

Start: 4:05PM

1. Opens new window in Firefox on desktop
2. Goes a Google search for "Vegas Strip restaurants"
3. Reads top results on page
4. Selects lasvegas.com link
5. Page allows her to select cuisine type, location, meals served, etc.
6. She looks through cuisine type
7. No vegetarian option available
8. She then scans the listings (in alphabetical order)
9. Asks "where are the menus?"
10. Can't find an appropriate link for menu
11. Clicks back button to return to Google
12. Selects next option in list (Urbanspoon)
13. - Gets interrupted by work phone call (about 5 minutes)
14. Scans page
15. Says "there are no filters"
16. Clicks back button to return to Google
17. Clicks 3rd link on page, diningguide.com
18. Scrolls down page
19. Restaurants are grouped by cuisine type (in alphabetical order)
20. Scrolls to bottom of page
21. Last category is Steak & Seafood (no vegetarian)
22. Clicks back button to return to Google
23. Scrolls further down the page
24. Scrolls back up and alters search to be "vegas strip vegetarian restaurants" (selects suggestion from Google search box)
25. Clicks first link for bonappetit.com
26. It is an article
27. She scans through it
28. Opens link for Wynn in a new tab and returns to article
29. Opens link for Prime Steakhouse in a new tab and returns to article
30. Scrolls down page until bottom
31. Clicks over to Wynn tab
32. It's the Bartolotta restaurant website
33. She finds and clicks on the Menu link
34. It opens a PDF in a new tab
35. After scrolling up and down menu, highlights "Vegetarian and Allergen menus available on request"
36. Says "hmm"
37. Scrolls back to top of PDF
38. Closes tabs for menu and restaurant
39. Browser lands on Bellagio tab
40. Page shows Prime Steakhouse info
41. After searching around page, locates and clicks the menu link
42. Page shows links to 3 different menus
43. She clicks on 2nd link
44. PDF opens in new tab
45. She scans it (there's only a category for side vegetables)
46. Closes PDF and clicks 3rd link
47. PDF opens in new tab
48. She scans it (all entrees are meat)
49. Closes menu tab and Bellagio tab
50. Checks work email
51. Back on bonappetit.com
52. Clicks back button to return to Google
53. Clicks 2nd link for vegetarianinvegas.com
54. It's blog posts
55. She scans through them
56. Opens link in new tab for La Cave
57. It opens an allergen menu that has vegetarian and vegan
58. She reads through menu and looks interested
59. Hovers mouse over Menu in topnav
60. Selects Entrees
61. Menu loads and she scans it (looks like a variety of meat options)
62. Selects Contact - Locations in topnav
63. Looks at page (has address, hours, and maps)
64. Looks at me and says she'd try this place
65. Writes the restaurant name on a sticky note

End: 4:45PM
APPENDIX C: AFFINITY DIAGRAM

(The full-size version of this diagram can be found as an attachment to our report)

Hierarchy
Yellow: Display a single observation
Blue: Labels for groups of related yellow notes
Pink: Label for groups of related blue notes
Green: Label for related pink notes
APPENDIX D: INTERVIEW TRANSCRIPT

Introduction
Hello and thank you for agreeing to this interview. My name is Nicole Sciackitano. We are interested in how people find vegetarian/vegan friendly restaurants. By agreeing to do this interview, you will help us establish a better understanding about the needs of a vegetarian. In today’s interview, we would like you to share with us your experience as someone who seeks out vegetarian food. There are no right or wrong answers to the questions that we are asking. We would just like to better understand how people find restaurants given their dietary preferences.

Informed Consent Form
Before we begin the interview, we would like you to read and sign the consent form. Please be assured that all the information we record will be protected and your identity will be anonymous. Only the research team and the Professor of the HCI 445 class will have access to the notes captured in this interview.

Interview Questions
Warm Up Questions
The warm up questions will allow us to get some background about the interviewee's choice on becoming a vegetarian.

1. **Question:** What triggered your decision to become a vegetarian? *(Reason for question: find the reasoning for their dietary choice, which could give clues about their habits when dining out)*
   
   Health reasons, my doctors and I agreed it would be best if I concentrated on fruits and vegetables and non-red-meat protein. I decided to go full vegetarian.

2. **Question:** What do you define as vegetarian? *(Reason for question: to get an idea about how strict of a vegetarian they are since some vegetarians are stricter than others)*
   
   Vegetarian means just not eating meat. No chicken, no beef, no pork.

3. **Question:** Do you consider yourself to be a strict vegetarian? *(i.e. you do not eat meat - red meat, poultry, seafood, or animal by-products such as lard, gelatin, chicken stock) [If answer is no, ask the next question, otherwise skip to question 6.]*
   
   No, I eat fish, and maybe chicken every now and then. But that’s just me. I think a true vegetarian probably wouldn’t.

4. **Question (if no):** Which of the following non-vegetarian foods do you eat: red meat, poultry, seafood, animal by-products (such as lard, gelatin, chicken stock)?
   a. **Probe:** In the past week, how many meals have you consumed containing [non-vegetarian food]?

   Seafood, animal by-products, and occasionally poultry.
**General/Specific Questions**

The General/Specific questions focus on the interviewee’s experience finding vegetarian restaurants and dining there. This will allow us to get a better idea about their past experiences and what was good and bad about these experiences.

5. **Question:** Do you dine out? For our purposes, “dining out” means any time that you eat a meal that was prepared by a restaurant. [If answer is no, then skip to demographic questions.]

   Yes.

6. **Question:** How often do you dine out in a typical week?
   a. **Probe:** Thinking back over the past seven days, how many times have you dined out?

   Probably about 5 or 6 times a week.

7. **Question:** Think about a recent time you dined out at a restaurant you had not been to before. How did you come to find out about this restaurant?

   I went to a restaurant called Old Town Social. I went there for a friend’s birthday celebration. I found about it through my friend.

8. **Question:** Thinking about that same recent time you dined out at a restaurant you hadn’t been to before, why did you decide to eat there?

   Because my friend wanted to celebrate her birthday there.

9. **Question:** Thinking about that same recent dining-out experience, did the restaurant provide a sufficient number of substantial vegetarian (ie: not just sides or appetizers options)?
   a. **Probe:** How many substantial options did you have to choose from?

   Yes, I saw there about half the menu provided good vegetarian options. Mostly salads, soups, pasta and sandwiches.

10. **Question:** Thinking about that same recent dining-out experience, did you know beforehand that substantial vegetarian options (ie: not just side dishes or appetizers) would be available?
    a. **Probe:** If so, how did you know that this would be the case?

   Yes. I actually checked out the menu on Old Town Social’s website before I went. I figured they serve pub food, but I just wanted to get an idea of what kind of vegetarian options they have -- not just burgers.

11. **Question:** What factors do you consider most important when selecting a restaurant?
    a. **Prompt:** (if respondent is struggling to answer) For example, some people might put a great emphasis on convenience of location, or hours of operation, or have a strict monthly budget. Are there particular considerations that you feel impact your decision making more than others?
Hmmmm. I mean that depends on a lot of things. Uh, the location, the uh, you know the type of cuisine I am in the mood for, the quality of the food -- of course, I am going to have to know that a restaurant has good vegetarian options, that’s a pretty big factor. It’s all those things.

12. **Question:** Ok -- let’s talk about some tools that you may or may not use to find places to eat. First, how often do you use the internet to search for restaurants?

I suppose if I am looking for a place I haven’t been to, I most likely search online. So I’d say almost always.

13. **Question:** When using the internet to search for restaurants, describe how you begin your search.

I usually just Google something like “Vegetarian Restaurants in... whatever city I am in”. So usually I begin with just a simple Google search and I’ll go from there.

14. **Question:** Are there particular websites that you prefer or that you have found to be more helpful than others? If so, which ones?

Umm well I don’t really have a preferred website I go to. I’ve used Yelp! and stuff like that...Urbanspoon. But I don’t find those types of sites particularly helpful...like they’ll list all the place but you know...the ratings and reviews that they have on there are usually pretty bad and not very accurate. But usually I use those sites [Yelp!, Urbanspoon] and jump to restaurant sites.

15. **Question:** Are there parts of the experience of searching for restaurants online that you find frustrating or inconvenient? If so, which ones?

Yeah, mostly like those reviews. Just like random people writing stupid reviews that...you know...just like a place that I know like a place that I have been to...and people just write nonsense about the place. So in general I distrust the reviews and the ratings, like the star system, that are used on those sites. So, that’s the most annoying thing, I’d say.

16. **Question:** Other than the online searches we just discussed, are there other methods you use to find vegetarian restaurants? If so, what are those methods?

Um, well local publications, they usually have like a monthly or weekly dining guide. And that’s usually a pretty good resource, they break down you know some of the best places by cuisine, and Vegetarian is usually include as a category. So you can find new restaurants they have opened in the past year, places you may not hear of otherwise. So if I see something I that’s appealing, I’ll give it a try.

a. **Probe:** *(if the respondent hasn’t mentioned word-of-mouth)* Do you get recommendations from others? Oh yeah. I can usually depend on recommendations from friends.

b. **Probe:** Among all the methods we have discussed for discovering and selecting your local vegetarian dining options [online searches, word-of-mouth recommendations, any other methods mentioned], which do you find yields the best results? Talking with friends, whose tastes are similar to my own, I trust the most.
17. **Question:** When conducting an online search for local vegetarian dining options, how important is it that you have access to a given restaurant's full menu? Very Important | Somewhat Important | Not Very Important | Not At All Important

It's somewhat important.

18. **Question:** Do you usually check beforehand to see if a restaurant you have never been to before has vegetarian options before making a final plan to go there?

Yes. Usually I will check the menu on the restaurant's site.

19. **Question:** Have you been to a restaurant without checking for vegetarian options prior to going? *(If respondent says yes, then probe.)*

   a. **Probe:** If the restaurant didn’t have many vegetarian options, what did you do?

      Yes I have and more often than not I can find something I can eat. Well if the restaurant doesn’t have any good veg options, I’ll most likely resort to eating a salad or whatever seafood options they have. Or I’ll just drink my dinner [Laughs]

20. **Question:** What do you do if you can’t find a restaurant that serves substantial vegetarian options?

   a. **Probe:** How often does this happen?

      i. **Prompt:** *(if interviewee doesn’t know how to answer this, prompt them with these answers)* Never | Almost never | Some of the time | Every time

      If I am meeting up with friends, I’ll just cook something before I go out and join them for drinks. Or I’ll offer to cook for them. If it’s just me, I’ll stay in and cook something at home. This happens “Some of the time”.

21. **Question:** How often have you been disappointed with the quality of vegetarian dishes at chosen restaurant?

   a. **Prompt:** *(if interviewee doesn’t know how to answer this, prompt them with these answers)* Never | Almost never | Some of the time | Every time

      This happens all the time. You know it’s difficult to find a places that do vegetarian-friendly items right. More often-than-not there will be a couple lackluster [vegetarian] items on the menu like a portobello mushroom burger and a couple salad entrees.

22. **Question:** How often have you been disappointed with the variety of vegetarian dishes at a chosen restaurant?

   a. **Prompt:** *(if interviewee doesn’t know how to answer this, prompt them with these answers)* Never | Almost never | Some of the time | Every time

      I’d say quite often, if the place is not exclusively a vegetarian or vegan restaurant.

23. **Question:** How often have you been disappointed with the number of vegetarian dishes at a
chosen restaurant?

a.  **Prompt:** *(if interviewee doesn’t know how to answer this, prompt them with these answers)*  
Never | Almost never | Some of the time | Every time

Often if it’s not a vegetarian restaurant.

24. **Question:** How do you decide what to order when you encounter a menu that does not provide substantial vegetarian options?

I usually order a salad or a seafood option.

25. **Question:** What constitutes a vegetarian-friendly restaurant?

I’d say there’s an ethos that comes with being vegetarian-friendly. It goes beyond just having a variety of items on the menu. You know any given restaurant will serve all kinds of dishes, right? It’s about incorporating vegetarian options within the cuisine, with as much thought and effort given to vegetarian options as is given to non-vegetarian dishes. It’s apparent that vegetarian dishes are not just an afterthought to the chef or person designing the menu. They [vegetarian options] just flow right in with the rest of the menu; they just happen not to include meat. You can tell when you look at the menu that that’s the case. You know? You really can tell. Those items are marked off with some kind of vegetable icon.

26. **Question:** Have you ever experienced difficulty selecting a restaurant because of conflicting dietary needs or preferences among your dining companions?

a.  **Probe (If necessary):** Could you tell me more about that?

b.  **Probe:** How were the difficulties resolved?

Yeah that happens a lot. If I am going out to dine with friends who are not necessarily concerned with going to a vegetarian-friendly place, I’ll suggest a place or two before had knowing that there will be good options for all of us. But if we can’t come to a consensus, I’ll just eat something [at home] before I go out.

27. **Question:** Switching gears now to when you travel out of town, how do you search for restaurants or dining options?

a.  **Probe:** Do your search tactics differ at all than when you are looking for places locally?

Well is I am travelling in an area that I don’t know, and I don’t any one else there who can give me some recommendations, I have to confess I usually get a little bit more conservative in my restaurant choice, because you know usually that’s a situation where I am there because of business or there short term, and so I’ll just grab some food at a chain, like Chipotle or Jimmy John’s. The food usually isn’t great but I know what I am getting before hand.

If I want to venture out of chain food options, then I will usually do an online search for restaurants in town like I would at home.
Demographic Questions

The Demographic Questions will help us compare the data so that we can understand the similarities and differences in our data. For example, we can ask ourselves questions such as which age group often uses technology to search for restaurants and which age group uses word-of-mouth.

28. **Question:** Switching gears again, what internet-enabled devices do you use on a daily basis? work laptop, personal laptop, Windows phone.

29. **Question:** How many hours a day do you use technology for work or entertainment?

   At least 8 hours or so

30. **Question:** What is your age (optional)?
    
    a. **Prompt:** (if interviewee hesitates to give their age) Where does your age fall within these ranges? 18-22, 23-25, 26-30, 31-35, 36-40 etc.

    31-35

Closing

We appreciate you taking the time to help us by doing this interview. If you are interested in the results of the research, we will be more than happy to provide you with the details once we have reached our final stages. If you have any questions in the mean time please do not hesitate to contact us. Thank you.
APPENDIX E: SPECTRUMS FOR PERSONAS

PERSONA SPECTRUMS

PERSONAS

“The Health-Conscious Teacher”
Nina Jansen

“Barber / Musician”
Henry “Hank” Fredrichs

“Software Engineer”
Meera Narayan

SPECTRUMS

Technical Proficiency

Low | N | H | M | High

Mobility

Low | M | N | H | High

Attitude Toward Technology

Low | N | H | M | High

Dietary Strictness

Low | M | H | N | High

Adaptability / Flexibility

Low | N | M | H | High

Frequency of Dining Out

Low | N | M | H | High
APPENDIX F: SURVEY QUESTIONNAIRE

Introduction
The purpose of the survey is to find out what people find to be most important when searching for vegetarian-friendly restaurants. By completing this survey you will help us have a better understanding about the needs of vegetarians who like to dine out.

Informed Consent
By taking this survey you agree to allow us to use the answers that you provided towards our research and include it in our research findings. Please be assured that all the information you provide will be protected. Only the research team and the Professor of the HCI 445 class will have access to the notes captured in this survey.

Contact Information
Please feel free to contact our research team if you have any questions or need any further information. The best way to contact us is to email vegresearch445@gmail.com.

Research team

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Instructions
Please complete the survey below honestly and to the best of your ability. There is no right or wrong answer. All questions are optional and if you choose not to answer one of them, you can skip it.

Duration
This survey will take approximately 20 minutes.
Survey Questions

About Your Lifestyle
These questions will focus on your lifestyle as a vegetarian.

1. Are you a vegetarian?
   ○ Yes
   ○ No

   [If no, end and thank]

2. How long have you been a vegetarian?
   ○ 0-5 years
   ○ 6-10 years
   ○ 11-15 years
   ○ 16-20 years
   ○ 21+ years

3. By your definition of vegetarianism, do you eat any of the following? Select all that apply.
   ○ Eggs
   ○ Dairy
   ○ Chicken
   ○ Seafood
   ○ Meat
   ○ None

Your Dining Out Habits

4. On average, how many times a week do you dine out?
   ○ 0-1
   ○ 2-3
   ○ 4-5
   ○ 6+

5. How often do you try a new restaurant each month?
   ○ 0-1
   ○ 2-3
   ○ 4-5
   ○ 6+

6. On average, how often do you dine out with non-vegetarians per week?
7. What issues do you usually run into when dining out with non-vegetarians? Select all that apply.
   ○ We go to restaurants that don’t serve many vegetarian options.
   ○ We have a difficult time finding a restaurant that meets both of our dietary needs.
   ○ I only have 2 to 3 options to choose from while my non-vegetarian friends have more than 10.
   ○ We never have any issues.
   ○ Other _____________

8. How important is it to you that restaurants offer a variety of vegetarian dishes in all parts of the menu (i.e. Appetizers, Entrees, Specials, Sides, etc.).
   ○ Very Important
   ○ Somewhat Important
   ○ Less Important
   ○ Not Important
   ○ No opinion

9. Do you usually check to make sure all ingredients in a dish are vegetarian before you order?
   ○ Yes
   ○ No

Your Restaurant Search Preferences
10. How do you typically find new restaurants? Select all that apply.
   ○ Personal recommendation
   ○ Internet recommendation
   ○ Newspaper or magazine recommendation
   ○ Internet search
   ○ Restaurant finder website
   ○ Restaurant finder app
   ○ Ad (tv, magazine, etc.)
   ○ Other _____________
   ○ I don’t know
   ○ N/A

11. How would you rate the ease of finding restaurants that cater to vegetarians?
   ○ Very easy
12. What types of details do you expect to have available when researching a restaurant? 

Select all that apply.
- Hours
- Location
- Website URL
- Photos of food
- Photos of restaurant
- Menu
- Pricing
- Other __________
- I don’t know
- N/A

13. Which of the details below is the most important to you?

- Hours
- Location
- Website URL
- Photos of food
- Photos of restaurant
- Menu
- Pricing
- Other __________
- None of the above

**More Details About You**

14. What is your age?
- 18-22
- 23-25
- 26-30
- 31-35
- 36-40
- 41-50
- 51-60
- 61+
- Prefer not to answer
15. What is your gender?
   ○ Male
   ○ Female
   ○ Prefer not to answer

16. Select the racial group(s) in which you classify yourself
   ○ White / Caucasian
   ○ Black / African American
   ○ Hispanic
   ○ Asian / Pacific Islander
   ○ Arabic / Middle Eastern
   ○ Native American Indian
   ○ Prefer not to answer

17. How often do you use the Internet daily?
   ○ 0-2 hours
   ○ 2-4 hours
   ○ 4-6 hours
   ○ 6-8 hours
   ○ More than 8 hours

18. Do you own a smartphone?
   ○ Yes
   ○ No

   [If no, end and thank]

19. How often do you use the Internet on your smartphone, including apps, websites, and email?
   ○ 0-2 hours
   ○ 2-4 hours
   ○ 4-6 hours
   ○ 6-8 hours
   ○ More than 8 hours

**Conclusion**
Thank you for taking the survey to help us better understand the dining needs of vegetarians. If you are interested in the results of the research, we will be more than happy to provide you with the details once we have reached our final stages. If you have any questions in the mean time please do not hesitate to contact us. Thank you.

**Contact:** vegresearch445@gmail.com