Facebook Pantry: Addressing Food Insecurity through a Widely Used Social Media Platform

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Abstract
42% of students in the University of California system struggle with food insecurity, the uncertainty of access to nutritious food. Communities already provide essentials through food pantries and drives. Our goal is to help those experiencing food insecurity to routinely locate affordable and accessible food. After surveying students at University of California, Davis, we found that students find out about deals mostly through word-of-mouth and social media. Our survey results also showed that users are just as likely to share deals as they are to find deals. With this information from our data, our team decided that the best way to notify the community about deals would be through Facebook, a platform that provides direct messaging and community post sharing. Users can explore different features of our

Facebook pantry through our Invision prototype. Some of the features include viewing and sharing deals in a specified city. This mockup proves that it could be possible to find out about deals through community member-shared deals on a commonly used social media platform.

Introduction

In the state of California, 1 in 8 people struggle with food insecurity. This means that 11.7% of all Californians do not know where their next meal will be coming from. The issue of food insecurity is even more prominent across university campuses. A 2015 study commissioned by the University of California Office of the President found that up to 42% of students throughout the UC system experience high levels of food insecurity. This widespread problem is the driving motivation for our project. While university campuses have taken strides to make nutritious foods more accessible to students through food pantries and community gardens, there is a much broader population that struggles from day-to-day to find food. Our goal is to find a solution to decrease this rate of food insecurity across all communities. Thus, our problem statement is: How might we help people experiencing food insecurity locate affordable and accessible food?

To provide a solution to this problem statement, we first conducted a user survey in order to gather user requirements and pain points. This questionnaire consisted of 7 questions to gain insight into the current issues faced by the community and what types of platforms individuals would be willing to use. Through this research we set our requirements and designed a prototype.

Our proposed solution is to create an extension for the widely used social media platform, Facebook. This extension will provide real-time updates on discounts offered at grocery stores and restaurants nearby and free meals provided by community kitchens or pantries. Our platform will have an added component for community engagement that allows individuals in the area to advertise discounts, opportunities for free food, or personal donations. Drawing on information from both community members and local businesses on a platform that is already widely used makes this a novel and easily accessible solution to the issue of food insecurity, while meeting the requirements of our target users.

After setting the platform requirements, we utilized Invision as the framework for creating our prototype. This prototype showcases the main features of the Facebook Pantry including a page for deals in your area and a community forum. The prototype is interactive and allows users to navigate through different pages. We then used this prototype to conduct user testing to test usability of our platform and identify any design flaws. Using this feedback, we conducted one more iteration of prototype design.

Background

Understanding the background of food insecurity and the gravity of its effects on communities and individuals allows one to see how important it is to deal with this topic. The food insecurity rate in California is 11.7%, and that has cascading effects for people in ways that limit their ability to live a healthy life and succeed in society. Food security refers to the ability to have constant access to affordable, nutritious food, and many Americans fail to meet those defined requirements. There are slightly above 4.5 million people in California not meeting these standards, with over 1.5 million of being children. This has huge consequences since children who grow up with food insecurity tend to have poor health at older ages. Furthermore, the early developmental years of children can be hindered if food insecurity is prevalent in the household for long periods of time; the negative effects on growth and learning that food insecurity has on young children can affect their potential to succeed as adults. However, food insecurity isn’t only about those in poverty; anyone from either side of the poverty line

can be facing food insecurity. Statistics show that factors such as obesity and unemployment correlate with higher rates of food insecurity as well. In addition, a significant reason for many of the households in California facing food insecurity is also due to lack of awareness or education regarding the access and availability for nutritious food. The statistics for food insecurity point to the fact that people of many different backgrounds can be dealing with food insecurity, and the subsequent effects are cascading in many cases. Food insecurity is a significant problem that has to be dealt with as it can lead to many other problems amongst families and individuals. Even having access to nutritious food doesn't imply that one can be food secure. Food insecurity can also be defined by being negatively affected in other aspects of a decent-quality life at the cost of having available access to healthy food. Choosing to have access to higher quality sources of food over the ability to pay rent or for healthcare is also a sign of food insecurity being present.

Conceptual Model

The primary requirement for this feature is that there would be no subscription fee or premium fee. The development of this feature is largely driven by the need for accessibility, and establishing a price for this feature would heighten the barrier of entry for usage of this extension. The feature also needs to have clear signifiers to indicate the affordances between the user and the extension itself as users may not be aware that this feature exists to serve them. The extension should also show options that are nearby. Another significant requirement is that it should be built on top of an existing application. This is to ensure that communities that are not food insecure can also join, as they can contribute knowledge and options to those who are in need of this service. Essentially, the people within two communities should also be able to engage with one another. Another requirement would be that the tool demonstrates options which are the most affordable options. This feature should also be intuitive to use so that it can be an age-agnostic tool. Lastly, the extension should have a broad range of options so that healthy options are included.

The conclusion was then to build an extension to Yelp to provide a community interface for users to contribute where they see deals at restaurants, kitchens, and grocery markets. We believed that building on an already existent dining app would result in users being more inclined to upload information.

Though initially, we wanted to implement our feature on Yelp since it already specializes in consolidating restaurants/grocery markets by area, we realized that another platform would be best. After visualizing our data, we found that participants are more likely to find discounted deals on groceries/restaurants through social media (Instagram story, Facebook post, etc.) or through word of mouth. Thus after drawing these insights, we decided to move our feature to Facebook as an application. This way, users can use Facebook messenger if they would like to let their friends know of deals through word of mouth, the second most popular option. Our prototype will be an extension on Facebook called "Pantry", similar to the "Marketplace" feature. The pantry interface will have a general deals tab and a community forum which users can contribute to. Users can filter through deals by location and category or browse through the deals others are talking about in the forum.

Prototype

We developed our prototype using the prototyping tool Invision. The prototype is an interactive interface that starts from a simplified version of the Facebook homepage. From the home page a user can navigate to the Pantry by clicking on its icon. This takes the user directly to a "deals" page where he or she can theoretically scroll through available deals in the area that are scraped from the internet or posted by local businesses themselves. In our prototype, however, this feature is static and is only meant to give the user an

idea of the functionality of the platform. From the deals page, the user can also navigate to the "community" forum page where he or she can see posts made by community members about deals, and can comment on these posts. The user is also able to "share a deal" he or she knows about. Additionally, there are icons visibly displayed on the left sidebar to clearly signify the affordances of the platform. There is a "location" bar which allows the user to change the location based on what geographical location he or she would like to see deals and a quick link to deals that fall specifically in the category of "groceries", "restaurants", or "pantries". Again, these prototype features are static in our implementation, but allows the user to navigate through the various pages to see how they could potentially use it to gain information on deals available in their community.

User Testing

The following section is the script that we provided to users that we tested with. The script was used consistently among all participants.

Describe purpose and basic functions of Facebook Pantry:

"This prototype is a Facebook extension called "Facebook Pantry". The purpose of this platform is to provide users with information about where they can find cheap deals on grocery items and food at restaurants. Users are able to browse deals in their area or look through posts made by community members in a forum. Users can also share deals that they have discovered in their area. This feature is intended to help communities of people who are seeking a way that centralizes finding out of discounted food. This feature can be used by people who are also trying to help others with their goals of accessing food nearby."

Explain prototype:

"This prototype is meant to reflect how the extension would be implemented within Facebook. The prototype only has functionality pertaining to Facebook Pantry, meaning that users cannot access their messages, groups, timelines, etc."

Give tasks for the user to complete:

"To test the usability of our design we will ask you to complete two tasks using our prototype:

1. Browse deals in your area
2. Share a deal in the community forum

We will be recording your screen while you navigate through the prototype. Please inform us when you have completed the task."

The following links are of screen recordings from the users that we tested with.

- User Test Sample 1
- User Test Sample 2
- User Test Sample 3

Generally, users were able to locate the "Pantry" feature component with relative ease. They navigated to the deals section easily. However, we found that there were difficulties in understanding where they could proceed after going to the main page of the Pantry (the deals). We realized that this could be easily resolved by an instructional tutorial that users could follow when they first click on the "Pantry" component.

We added this component to the existing prototype as shown in the image to the left.

We also tested with a user after adding the tour.

- User Test after adding tour component

The link for the complete prototype can be found here: Facebook Pantry

Generally, users responded well and stated that they would use this app. They were especially pleased with the fact that it was built on top of Facebook, as they already had accounts with Facebook and thus would be convenient to use. They tried to navigate the other components as they were intrigued as well.

Discussion

There were certain aspects of our initial prototype user-testing that were confusing to users. As described earlier, users were able to generally find the "Pantry" feature and were able to navigate through different features. After conducting user-testing, we found that users were confused on where/how to proceed after landing on the main Pantry page. From this information, we decided to implement a tutorial that pops up the first time Pantry is opened. Conducting user testing made us realize that user testing is a crucial step in the design process. Our team members were the designers, *not* the users. Not being the users requires us, as designers, to gather user feedback in order to make our product accommodable for those who would use our application regularly.

Our team also learned that it is very important to collect data about the user and topic of choice. It is important to first decide on a general issue so that there is a base line that can be altered after learning more about the user. Our team initially wanted to develop our product on Yelp, a restaurant/store locator, since it already compiles information about restaurants and stores around you. However, after interviewing students at UC Davis, we found that students are much more likely to find out about deals through word of mouth and social media. From this, we decided that it would make much more sense to implement the feature on Facebook, since Facebook provides a direct messaging feature and the ability to share posts with your community. We decided that users would be more inclined to share/find deals through a dedicated-tool on an already widely-used social media platform. Collecting information from users was very important in making this huge change of implementing our tool on Facebook instead of Yelp. Only after visualizing and analyzing our collected data, we were able to make this decision to better accommodate our application to our audience.

Additionally, our team also learned that it is possible, and sometimes beneficial, to create a brand new feature on an already existing platform. This process is known as *piggyback prototyping*, a prototyping mechanism introduced by Catherine Grevet and Eric Gilbert for "designing new social computing systems on top of existing ones." Our team decided it would actually be much more beneficial to build upon an already widely-used application instead of a new application that might make new users hesitant to use. Building our future on Facebook also allowed us to dedicate our team's time to focusing on our product's core idea of helping those in our community struggling with food insecurity on a day-to-day basis. Our time was solely dedicated to our product's objective rather than implementing community post-sharing, a feature that already exists on Facebook.

Future Work

For future work, we plan to go through more user testing to gain feedback on different features we could add that would improve user experience. Similar to how we discovered from initial user testing that a tutorial would be beneficial to most users regarding learnability for the pantry feature, we aim to get feedback on additional functionality we could add to the mockup. By continuously getting user feedback and implementing basic functionality to the mockup, we can learn which features can be improved and which can be added to provide a better experience for users before fully implementing them. Our surveys served as the first step in learning about high-level design choices such as shifting our feature from appearing on an application made for finding deals to a commonly used social platform like Facebook. Our next steps include iterative prototyping on our mockup by getting constant user feedback from user testing and making adjustments based on each step of changes and testing. Furthermore, after implementing our feature on Facebook following feedback from initial surveys, our target users are currently assumed to be experienced Facebook users. We hope to address this in the future by making our feature more accessible to those who may not be experienced Facebook users or even have a Facebook account; this would be in accordance with our goal to help those struggling with food insecurity. The actual implementation would be future work we'd want to focus on moving forward with this feature.

Peer Rating

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