**Mission Statement:** Our mission is to promote healthier eating and the growth of small businesses by making the finding, buying and selling of local organic produce simpler and more transparent for everyone.

**Team:**
*Michael Chao:* Main implementer of the interactive prototype. Also helped to write and edit the paper.
*Jee Park:* Recorded and edited video. Also created the extra credit website and helped to write and edit the paper.
*Prabesh Giri:* Helped to create the extra credit website. Also helped to write and edit the paper.
*Vineet Shah:* Helped to implement the interactive prototype. Also helped to record and edit the video as well as write and edit the paper.
Problem and Solution Overview

Farmers who supply large grocery stores often speed up and artificially enhance the production of their produce in ways that can lead to harmful side effects including cancer [2]. Local organic food is one method to get fresh fruits and vegetables that have not been genetically modified in dangerous and unnatural ways while also contributing to the local economy. However, many organic food growers do not have storefronts; they sell through online orders and grow in popularity through word of mouth. Other organic growers only have roadside stands and have no online presence at all. In order to promote local organic produce, we propose a website where local organic farmers can create an online presence for themselves and their produce. Our goal is to create a website which will allow local organic farmers to sell their produce online while enabling consumers to buy, view and rate local organic produce in their area. In addition, our website also contains community information such as local farmers markets, which can be contributed by both local farmers and consumers. Our goal is to make the buying and selling of organic produce more transparent while still providing useful functionality to the user.

Background and Review of Past Work

Organic foods are becoming a booming business. In 2009 alone they accounted for almost four percent of all food sales and continue to grow each year [10]. Because of this, many companies and applications have been created to help facilitate the locating, buying and selling of local organic food.

One company, called the Suncoast Food Alliance, was created to supply restaurants with locally grown foods [4]. However, this service only caters to restaurants and unfortunately there is no convenient technological means of using the service. There also exists an agricultural marketing service provided by the USDA to find local farmers and produce in your area. The USDA even provides the types of payments accepted and the products available [1]. However, the USDA does not facilitate the buying or selling of produce within their website nor do they offer the capability to rate or comment on a particular product or farm. One iPhone application that we discovered is called “FarmFreshNYC” and gives users information about farmers markets and a list of foods that are in season, as well as facts about certain foods [8]. The problem with this application is that it does not actually list the names of farms or specific types of produce being sold at a farmers market. Among the better products that we have discovered is a website called findlocalproduce.net, which provides a very simple interface of a map of the U.S. on which users can click on individual regions to find local produce [6]. The problem with this website is that the interface is the only good feature. Although the site provides a telephone number and address, there is no other information provided about the vendor or about the specific products that they sell. This is an issue because users must still perform other steps in order to actually buy local organic produce. One of the goals for our application was to integrate the locating and buying of local organic produce into one site. This allows users to more easily find the products they are looking for which will help promote the buying of locally grown organic produce.

One of the more popular applications that we discovered is Locavore, which is available for both iPhone and Android platforms [5]. This app uses a map interface similar to findlocalproduce.net and allows users to locate organic produce according to their current location. However, the same problems exist for this application as well. It allows users to locate organic produce but it
does not facilitate the buying or selling of local organic produce. Another important application that we discovered was an online website called LocalHarvest. As soon as we visited the website, we knew that this website was intended for a very specific user. The website provides events, forums, newsletters, searches and even a way to shop online. However, it took more than a few minutes of clicking around to fully understand how to use the search and shop features. The amount of navigation on the page is nearly overwhelming, especially for users who are not that technical. It is clear that this website was intended for a true “locavore” and not the average user. Another important issue with LocalHarvest is that their focus is not on providing local organic food. Instead, most of the farms on their website are large farms which have been chosen because they can provide a large amount of produce.

Finally, a somewhat new application which has only been online for a few years is AmazonFresh [2]. AmazonFresh is a website, run by Amazon, which allows users to buy food and other products from their website and have it delivered to their house. The website does sell some organic produce but also sells a lot of other products that you would usually encounter in a grocery store. Although the interface is clean and less cluttered than the normal Amazon site, there are still some issues with it. For instance, right now only users in Seattle and in surrounding neighborhoods can actually have the food delivered. Also, the main focus of the site is not to provide local organic produce but to provide an online grocery store. Overall, in our research we found a few useful solutions but no single product that provided the convenience and features that our project has been focusing on.

Description of Interactive Prototype

After refining our Balsamiq prototype and discussing multiple interface ideas, we have selected one interface design which we believe will best benefit the users and make their experience
simpler and easier. In order to implement our interactive prototype, we used Ruby on Rails with a Sqlite3 backend. We also used embedded ruby code in html as well as CSS to format the pages within the prototype. While implementing our prototype, we felt that we should try and make our interface as simple and usable as possible rather than inundating the user with a huge amount of information at once. This idea can be seen throughout our entire interactive prototype but is most prominent in our home page (Figure 3). Our homepage consists only of a logo and a search bar through which the user can search for types of produce, by farm name and even by location in order to find information regarding locally grown organic produce.

The results page then shows information about farms that pertain to the search parameters. The user is also be able to narrow their search in the results page by ordering the farm results according to distance, ratings or prices. Also, the user is be able to see an average rating for each farm in the results page. Another important part of our interface are the pages for individual farms. These pages were designed to
Testing Method

Participants

In order to perform usability testing on our interactive prototype, we chose two participants whom we felt would reflect a random sample of possible users of our system.

1. The first participant, Ryan Z., is in his early 20’s. He is a Finance major at the University of Maryland. Ryan is the friend of a friend. He has shopped online a few times and enjoys shopping for organic produce at his local grocery store. He has not purchased food online in the past.

2. The second participant, Bryan K., is in his early 20’s and is currently a marketing major at the University of Maryland. Bryan is the roommate of a friend and was discovered while looking for participants for testing of the interactive prototype. He explained that he spends a few hours on the computer everyday and shops online regularly. He does not have experience buying food items online, but has bought local produce from markets in the past.

Testing Environment

1. Ryan: The tests were performed in Vineet's apartment. It was performed on a Macintosh computer using a Ruby on Rails server, a Canon EOS T1i, and QuickTime to perform the screen capture. Vineet facilitated the testing while Michael observed and took notes.
2. **Bryan:** The tests were performed in the facilitator’s home. It was a closed room with the testing performed on a Mac system, running the application through the localhost. The participant allowed us to record his back and Jee facilitated the testing while Prabesh observed and took notes.

**Tasks**

We asked our users to perform three tasks. In the first task, we presented the user our homepage with a search bar, and asked them to enter a value into the search bar and trigger the search results. In the second task, we presented the user a page of search results and asked him or her to rate a particular item; this task implicitly involved navigating from the search results page to the farm’s homepage, which contained the rating mechanism. The third task involved a more complex search; the user was asked to find the highest rated blueberries in his or her area and add a certain quantity of this item to the cart.

**Usability Testing Procedure**

Before we began our procedures we had our participants fill out the consent forms to allow us to film them. Much like the paper prototype testing, we created a procedure that would be used in the process for each participant. The first step in the procedure was to explain the purpose of our system and what it was meant to do. Once we explained the information to the participant, we then gave a quick overview of the interface. The next step was to have the participant begin performing the tasks associated with our project. The users were asked to speak their thoughts out loud as they made progress through the tasks. As the participant completed each task we took notes on whether or not they had any issues or if they especially liked or disliked something. Once the user had completed all of the tasks, we then spoke to them about our interface and asked if there was anything that they would like to see added or changed.

**Usability Testing Measure**

During each task, we were mainly looking for the response of the participant, focusing on any actions or comments he or she made. Their responses were able to give us information about their thoughts on the design of our interface. Although not explicitly measured, we also paid attention to the amount of time it took for each participant to complete each task, and whether they were having trouble. This gave us information as to whether the interface was difficult to use for certain tasks.

**Testing Results**

After performing the usability tests with the two participants we received useful information which helped us to refine our prototype. A brief summary of the tests results are provided below:

1. **Ryan:** Our first participant sped through the first task without a hitch. Our interface was designed to be very minimal and with just the search function on the main page, he was able to figure out exactly what to do without hesitation. For the medium task of rating a product, Ryan was easily able to understand how to insert his own rating. Although the popup window added extra steps to a potentially quick task, Ryan’s interview demonstrated that this page segmentation made it really easy to understand the workflow. The only time that Ryan had an issue with the website was for the difficult task of buying a product. Here, after adding an item to the cart, Ryan was stuck. He did not
know what to click in order to return to his original navigation flow. Here, we learned that knowing one’s place in the navigation flow is very important; if at any point the user does not know how he or she arrived at a certain page, it is very difficult to get back. This interview demonstrated that we need to make page navigation more apparent, particularly in order to return to the previous page.

2. Bryan: Our second participant was also easily able to search for a product. The user was easily able to spot the colored stars on the website and tell which farm had the highest rating. After selecting the higher rated blueberries, he immediately saw the “add to cart” button next to the drop down menu, and recognized that as the function that afforded choosing a quantity. When asked to rate the product, the user began to click around but ended up on the wrong page, and eventually back to the home page, at which point he repeated the process by searching for the same product, looking for the highest rated product and finally finding the “add review” function. Bryan informed us that he liked the simplicity of the site, but thought that in terms of design it lacked some appeal. He also mentioned that there should be a better way to get back to certain products that were being viewed previously.

Suggested Interface Revisions

Although both of our participants were able to interact with our prototype without any real issues, they did give us some useful feedback on our prototype. One issue that came up with both of our participants was their inability to return to the home page after adding an item to the cart. They suggested that we include an extra link on the page to make easier to return to the homepage of our prototype without having to click the ‘Back’ button on the web browser multiple times. Another important suggestion made by one of our participants was to include a link visible on every page that would list recent orders. He believed that this would be useful in going to back farms for repeat business or for adding a rating for a product. We completely agreed with both of the suggestions the users made for revisions. In fact, we had considered implementing the recent orders link but due to time constraints we were unable to get the functionality working. Overall, we were very happy with the input from the users and felt that both of the suggestions would definitely help to better our interface.

Summary Discussion and Lessons Learned

In general, we were happy with the results of our interactive prototype and the functions that it performed. Through our interface, users can find, buy and rate locally grown organic produce which we believe will make locally grown organic produce more accessible to consumers. After performing usability testing with potential users, we gained useful insights which can further better our user interface. One important suggestion was to make the navigation flow of the site more transparent. Another suggestion was to add a recent orders link which would make rating and buying from a farm multiple times simpler. If we were to perform usability tests again we believe that we could improve the process by testing our prototype with more users. By testing with more evaluators, we would be able to gain more feedback about our interface and how to further better it.

Overall, this entire project has been an extremely useful learning experience. After completing each stage of the project we gained useful insights into the design process of creating a user
interface and the amount of work that it takes to create such an interface. One of the most important things that we learned through this project was the importance of user testing. Since we are the creators of our application, the user interface seems very straightforward and simple. However, after performing user evaluations of both our lo-fi prototype and our interactive prototype we realized that changes would be necessary if we wanted to create the best interface possible. Without this input from evaluators, we would not have realized the issues with our design and our interface would have suffered for it. We feel that this project has been successful in showing us the steps needed to create a useful user interface as well as making us more conscious of interface design in the future.

Extra Credit Website

The Grassroots project website (http://philosophyandsound.com/grassroots) was built using a template from ThemeForest. The website utilizes PHP, jQuery, Html and CSS. PHP is used to grab form data from the “Contact Us” page that allows users to send an email to our group. jQuery is used in the banner to allow scrolling through different images. [Fig. 5]

The other pages of the website are built using HTML, and utilize CSS div classes to include similar formatting to different areas of the website. The original template was intended for a business website, and it was necessary to change the code to apply proper formatting for different pages. Using Adobe Photoshop, we changed the original banner to show our team logo, name and images. We
made our changes to the website on the Google Chrome web browser, but also tested on Mozilla Firefox and Microsoft Internet Explorer. The template includes code that allows the website to function correctly across different browsers. Much like our Grassroots web application, we wanted an appealing yet minimalist website that could provide necessary information about our project and team.

References

6. "Find Local Produce | for fresh fruits and vegetables straight from farmers." Find Local Produce | Search for Local Produce in Your Area | Find Local Produce | for fresh fruits and vegetables straight from farmers. 18 Feb. 2012 <http://www.findlocalproduce.net/>.

Appendix A: User Testing Notes

- Ryan
  - Easy task - Was not typing in the box, had not clicked in the box first (minor issue)
  - Medium task - Knew where to go, no issues
  - Hard task - Confused after arriving at cart, clicked navigation links and went back and forth between previous page and cart a few times. Might need a better segue back to the home page or search results page.

- Bryan
  - Easy task- Was able to perform without any issues. Knew exactly what to do
  - Medium Task- Had a few issues at first was able to navigate back to the right farm page and add the rating.
  - Hard Task - Able to perform the task without issues. Once he saw the ‘add to cart’ button he knew exactly what to do.
Appendix B: Demo Script Guideline

Participant’s Name, thank you for volunteering to participate in our user testing. You are free to disclose any personal information and may opt out at any time, please clearly let us know verbally if you are uncomfortable with sharing any information.

As you may have heard, most store-bought produce contain chemicals in order to preserve or enhance the foods, and we believe that local produce is the way to go. With local produce, you are able to buy the foods straight from the source. This ensures that no chemicals have gone into the foods and that you are getting the highest quality product.

Our project is called Grassroots. Our aim is to make it easy for both experienced and first-time users to buy local organic produce online.

We will be using an interactive prototype (Show website) and you will be instructed to do three different tasks. During each task, please voice your thought process aloud as you are completing the task and be as honest as possible. Express any critiques, good or bad. Feel free to ask questions before each task but please refrain from communicating with us directly during the tasks.

Explain the three tasks at the right time, showing the homescreen each time:

1) Search for a product of your choice.
2) Assuming you have just bought what you have searched for, give it a rating of your choice.
3) Search for a product of your choice that has the highest rating, and purchase it online.

RECAP: What did you like/dislike about our interface? Any suggestions?

Once again, thank you for participating.
# Appendix C: Participant Forms

## Grassroots User Testing Consent Form

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Grassroots</th>
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<tbody>
<tr>
<td><strong>Purpose of the Study</strong></td>
<td>This research is being conducted by Michael Chao, Prabesh Giri, Vinod Shah, and Jee Park for a Human Computer Interaction project. We are inviting you to participate in this research project because you represent non-technical online shoppers. The purpose of this research project is test an interactive prototype.</td>
</tr>
<tr>
<td><strong>Procedures</strong></td>
<td>The procedures will involve performing three tasks relating to our interface while being video recorded. The recording will be shown to the instructor only and no one else. The video will be hosted on privately on Youtube, available only to those with the direct link. You may choose to allow us only to film your back while testing so that your face does not appear in the film. Further instructions and details will be given before the testing.</td>
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<tr>
<td><strong>Right to Withdraw and Questions</strong></td>
<td>Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time.</td>
</tr>
<tr>
<td><strong>Statement of Consent</strong></td>
<td>Your signature indicates that you are at least 18 years of age; you have read this consent form or have had it read to you; your questions have been answered to your satisfaction and you voluntarily agree to participate in this research study. You will receive a copy of this signed consent form. If you agree to participate, please sign your name below.</td>
</tr>
<tr>
<td><strong>Signature and Date</strong></td>
<td>NAME OF SUBJECT: [Please Print] Ryan Zheng</td>
</tr>
<tr>
<td></td>
<td>SIGNATURE OF SUBJECT: Ryan Zheng</td>
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<td></td>
<td>DATE: 05/09/12</td>
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</tr>
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<td>Signature and Date</td>
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