



Mobile Shopper

Research project 2

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Executive Summary

Team Mobile Shopper is working on developing a mobile application that will allow users to shop multiple retailers. For our first round of research we conducted user interviews. This report discusses our second round of research in which we used two additional research methods, an online survey and user shadowing, to collect more information about the mobile shopping habits of users. The survey allowed us to examine the feelings a population of users had about features of our application. Shadowing users allowed us to gain a more in depth view of the mobile shopping experience. After this study, we now have a better understanding of the extent at which our previously determined features are valued by mobile shoppers. Based on this new information it was determined that revisions to our initial concept were necessary. Therefore, we created user scenarios to describe the experiences our new design will address and updated our feature list to reflect the changes. This report will provide more information on how these findings will be applied to the design of our product.

Introduction

Streamlining the mobile shopping experience is a goal of various business stakeholders. Team Mobile Shopper has begun examining the creation of a new mobile application specifically designed to assist the user by creating a more efficient and enjoyable mobile shopping experience. This effort represents our second study to examine how effectively our initial product concept will fulfill the needs of our target user group. Using the results of our previous study we have designed two tasks to examine which features to focus on for our prototype. The remainder of this document contains a summary of findings, a description of the tests that were conducted, results of observations and a conclusion that provides recommendations for the application going forward. The methodology sections contain a brief overview of the methods conducted in this study followed by a more detailed description of the two tests performed. The results section then provides an overview of the results obtained followed by a more in depth view of observations. Finally, the conclusion provides recommendations for the mobile shopping application developing going forward.

Summary of Findings

Our findings from the survey and user shadowing confirmed some of our previous findings. In both our first and second research studies users consistently told us that notifications were very important and that the stability of applications gave them more confidence in mobile purchasing.

Our previous findings that errors in mobile applications will make users less willing to purchase items were also confirmed. During the study one of the users we shadowed decided not to purchase for this reason. The differences between the user experience with purchasing through the App Store and the issue plagued mobile browser confirmed that a simple and efficient process is necessary.

Based on our efforts the following key features are deemed important:

- Visuals of products
- Short descriptions close to pictures
- Link to greater details
- Recommendations
- Search features
- Errors must be properly addressed
- User accounts for quick purchases

From our online survey we gained more in depth knowledge of the features users feel are important in mobile purchasing. Product details, notifications after purchase, product

images and product availability were the features that users were most likely to use. This will help us to focus the information we present in our designs. Users also gave us information on the top features they would like to compare which were prices, discounts and product availability.

Based on our new findings we created some users scenarios to demonstrate typical user situations our product design will address.

Scenario 1

Sarah is at the grocery store on Saturday afternoon when she remembers that she and her husband are attending a friend's birthday party that evening. She has a busy day planned and still needs to get a present. She remembers her friend mentioned that she wants a new movie that just came out on DVD. On her iPhone Sarah opens the Mobile Shopper App and searches for the movie. The product comes up with a listing of stores nearby that have it and their prices. Target is at the top of the list since Sarah has saved this as a preferred store. Sarah sees that the price at Target is \$15.99 which she thinks is a good price. She selects Target and the application shows her purchasing options which default to her saved credit card and the preferred store she has saved. Sarah clicks okay and types in her password. The application shows her that the item has been purchased. As she is leaving the grocery store she gets a notification that the item is waiting for her at Target customer service. She stops at Target on her way home, shows the customer service associate the notification on her phone and is leaving with her purchase in under 5 minutes without having to walk past the front entrance of the store.

Scenario 2

Ken is out with the guys on Thursday night. He gets a call from his wife saying that they are out of diapers for the baby and he needs to pick them up on his way home. Ken doesn't remember what brand or type of diapers to buy but he doesn't want to ask since his wife will expect him to know. He opens up the Mobile Shopper App and pulls up his past purchases list. He chooses Huggies size 3 diapers from the list. The application shows him that the item is available at Walmart, Jewel and Meijer. Walmart is at the top of the list since this is where he purchased them last time. He selects Walmart and is shown purchasing options with his saved credit card and the closest Walmart store to his house as the default selections. He clicks okay and enters his password and is informed that the item has been purchased. He receives a notification a few minutes later that the item is ready to be picked up. He figures he can hang out a while longer since his purchase will be quick. On his way home he stops and picks the item up at the Walmart service desk and is on his way.

Features

We also updated our feature list to account for the input users gave us in this round of research. The following list contains the revised feature list.

- 1) Build customer confidence
 - The application should have fast performance
 - The application should be stable and provide adequate error feedback
 - Errors should be resolved by the system when possible to prevent over use of error messaging
- 2) Allow users to purchase items for shipping
- 3) Allow users to purchase items and pick up in store
- 4) Provide timely status notifications during the process when the order status changes
 - Notify when order is complete
 - Notify when item has been shipped
 - Notify when item is ready at the store
 - Notify if there is an order problem/cancellation
- 5) Allow users to perform a keyword search for a product
- 6) Allow users to access product information
 - Description/Details
 - Detailed product images
 - Availability of items at a specific location
 - Product Specs
 - Reviews/Ratings
 - Different stores which carry the item
 - Availability of items at a specific location
- 7) Allow users to access items from a list
 - A list of items previously purchased should be automatically generated
 - Users should be able quickly select items to purchase from their lists
 - Items can be added by the user to a list
 - Recommendations lists should be provided based on past history
- 8) Allow users to compare items similar items at the same or different stores
 - Users should be able to compare prices
 - Users should be able to compare discounts & coupons
 - Users should be able to compare product availability
 - Users should be able to compare product specs
 - Users should be able to compare ratings

Methodology

In order to further examine the needs of target users, team Mobile Shopper performed a study to further examine specific aspects of our proposed application. Based off our initial goals, it was determined that further examination of concepts obtained through interviews would give a better view of mobile shopping habits. Based off of patterns noted in the results of interviews conducted, our team established a set of user requirements for our application. For this effort, our main objective was to determine to what extent these requirements could be generalized to fit the needs of other mobile shoppers and what revisions should be made to ensure they can be. In order to examine this in further detail, a survey was conducted. In our previous study participants commented on their preference of web browsers to mobile applications because of their comfort with the interface. Our second objective was to compare the efforts of users shopping through a mobile phone application versus mobile browser application in the real world. In order to examine this, our team shadowed two users while attempting to purchase products through their mobile phones.

Survey Overview

To obtain a view of habits for the population of mobile shoppers, quantitative data was desirable and thus an online survey was created. An online survey was considered over other methods as the probability of obtaining a greater random sample of users who have made mobile purchases was considered higher. Although not substantiated, our team felt that online respondents would be more tech savvy and have more online buying experiences than those obtained by other methods. In order to create the survey our team first created a schedule and then brainstormed questions based on interview results. Our questions were then compared and refined by our team in order to ensure they met the project goals. Following this our survey questions were pretested to limit any confusion from potential test takers. Next the questions were revised and fielding efforts began.

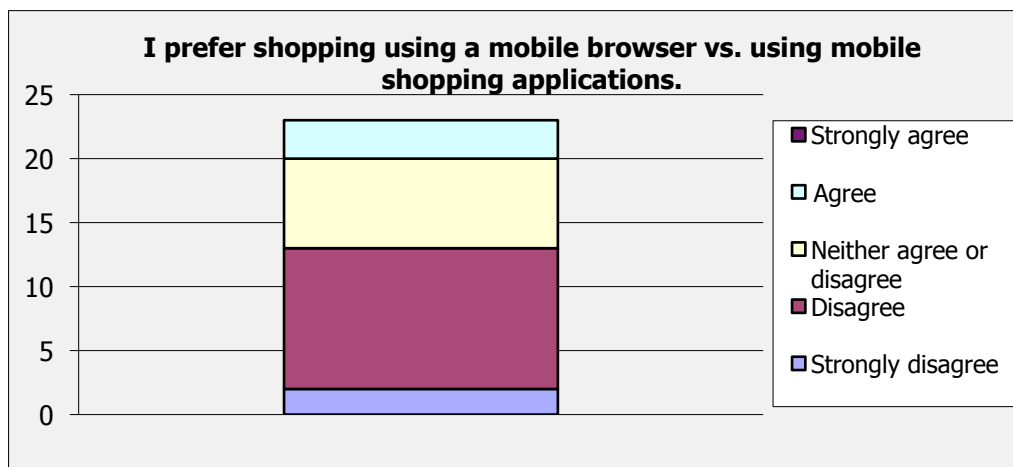
Fielding our surveys involved prescreening, recruitment, and testing while adhering to ethical standards. Included in our online surveys was an introduction containing required user consent information and a pre-screener. Users who did not fit the qualifications were thanked for their time and were exited from the survey. Recruitment involved sending mass emails to researcher contacts. Contacts were asked to participate in a survey with no incentive promised but a description of the importance of this study. Survey results were then compiled and processed.

User Shadowing Overview

In order to learn more about the purchasing process we decided to shadow two users while they made purchases with a mobile device. We felt that this would give us a chance to observe the process of purchasing and see what issues and benefits occur with current applications. Through our personal networks, we recruited users that currently use their mobile device to make purchases and would be willing to let us watch them make a purchase. The users were informed that the research was for a class project and the findings would be anonymous and would not be published. Once the users gave us verbal consent we set up a time to meet with them in a place where they would typically make a mobile purchase. While the users shopped the observer watched the user attempting to make a purchase and took notes on their experience. Following the process users were thanked for their participation and results were processed.

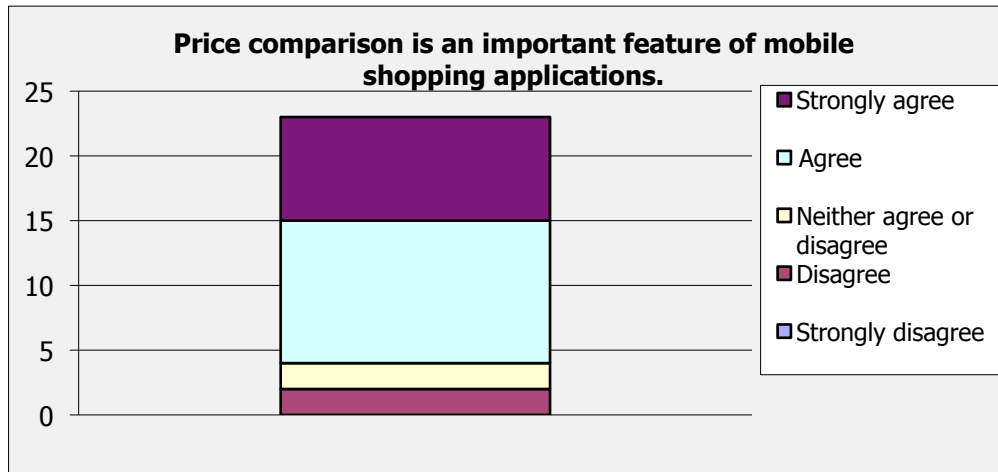
Survey Results

Our requirement for survey participants to have purchased via mobile applications disqualified many participants but we felt it would give us an audience more likely to use our application. The screening questions we used eliminated anyone who did not use a smart phone and had not used a mobile application to shop. The 23 users who did qualify ranged in age from 18 to 60 years old and had used both mobile applications (56.5%) and a mix of both mobile applications and mobile browsers (43.5%) to purchase. While 30.4% of users did not have a preference for shopping via a mobile application, 56.5% of users preferred shopping via mobile applications.

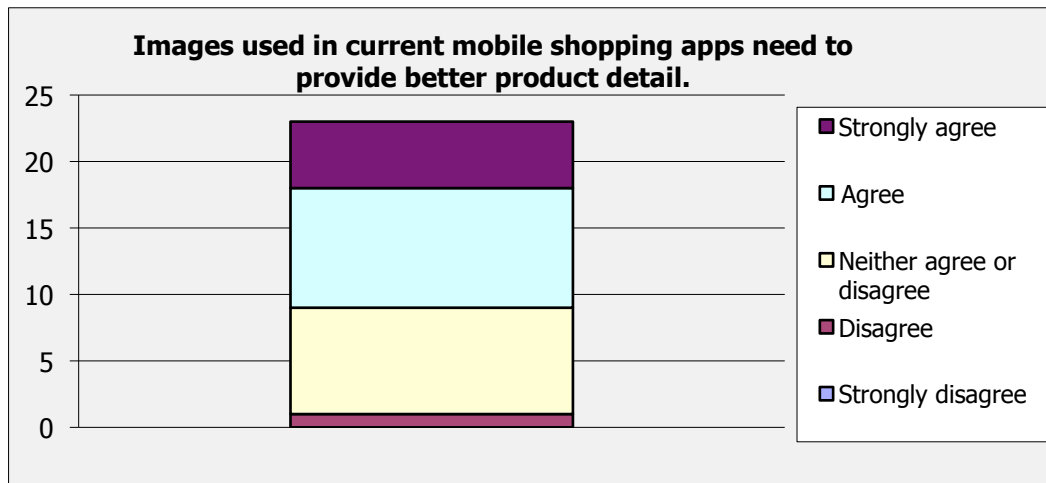


Features

When asked whether comparison shopping was an important feature for mobile shopping, 82.6% of users agreed or strongly agreed and the median response was agree. Because of our small sample size there is a standard error of .08 for this value so more research should be done to verify this finding.

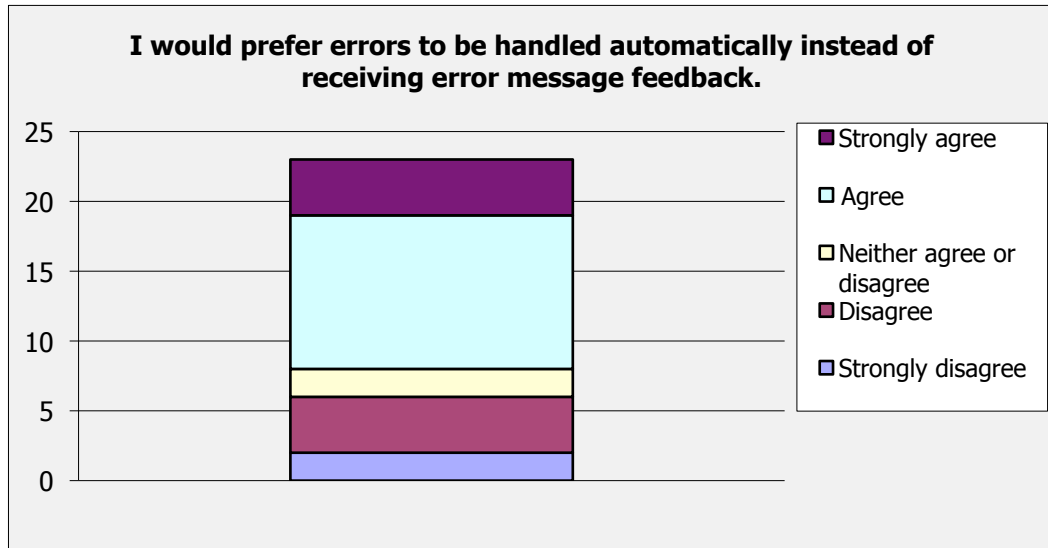


When asked if images used in current mobile apps need to provide more detail, 60.8% of users agreed or strongly agreed and the median response was Agree. Because of our small sample size there is a standard error of .1 for this value so more research should be done to verify this finding.

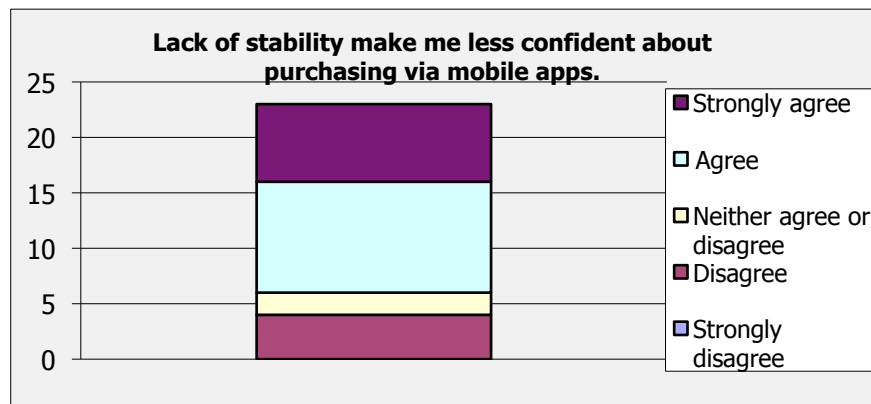


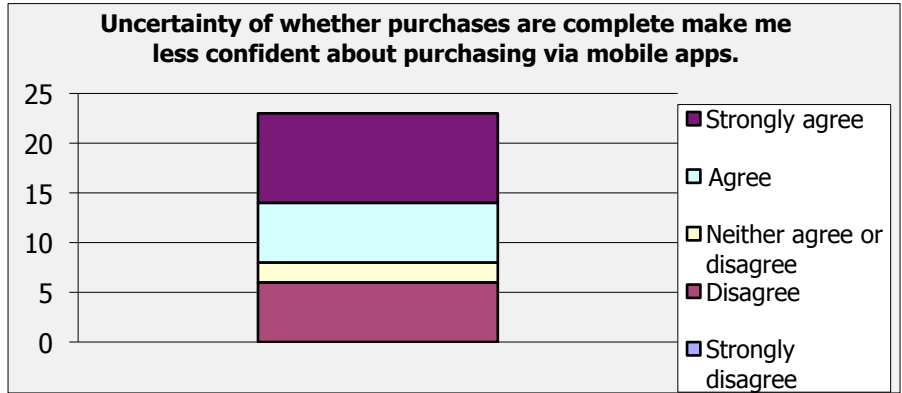
We asked users several questions about the way error messages are currently handled by mobile applications and how they would prefer errors to be handled. Users did not feel strongly about whether they are satisfied with current mobile application error handling. The median response was Neither Agree or Disagree. When asked whether they would prefer to have errors automatically handled instead of receiving error messaging 65.2% of users agreed and the median response was Agree. Because of

our small sample size there is a standard error of .1 for this value so more research should be done to verify this finding.

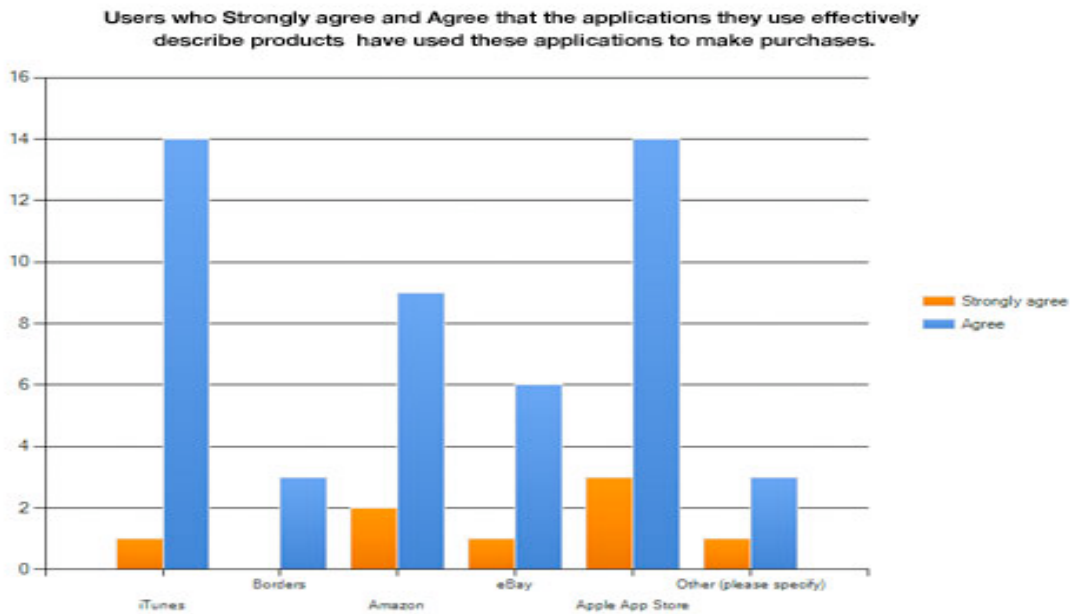


We also asked users about how errors and stability of applications may affect their confidence in purchasing. Users felt strongly that errors in mobile applications would make them reconsider purchasing, with 73.9% saying they agreed or strongly agreed and the median answer being Agree. Similarly, users also told us that uncertainty about whether their purchases were completed made them less confident about purchasing via mobile apps. 65.2% of users agreed that uncertainty made them less confident and the median response was Agree. Because of our small sample size there is a standard error of .09 and .1 for these values so more research should be done to verify these findings.





When asked if they felt that the mobile applications they currently use describe product effectively 78.2% agreed or strongly agreed with a median response of Agree. The chart below shows the application these users have used. Most of the users have used Apple iTunes and App stores.



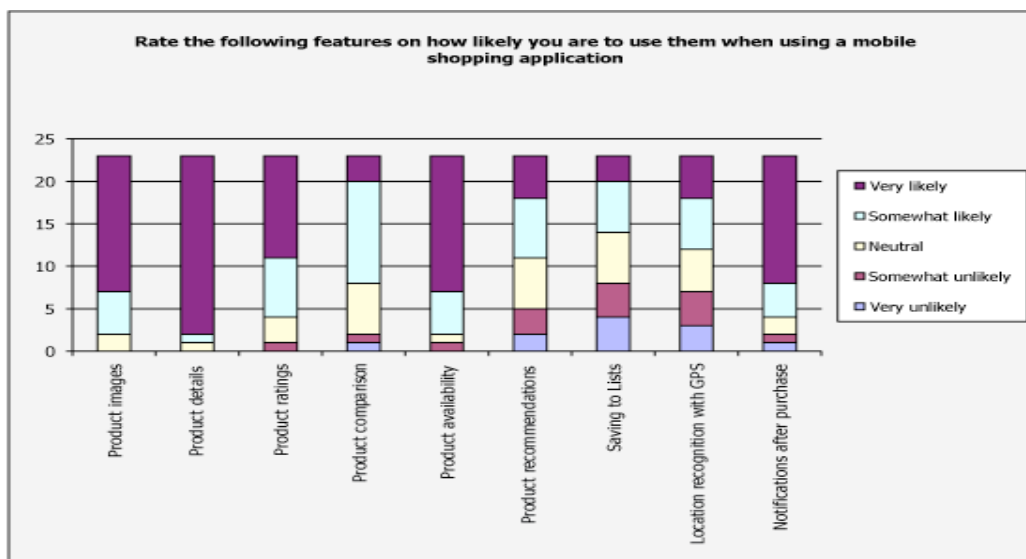
Some of the features we asked users about did not get a strong response in either agreement or disagreement. When asked if they check multiple stores before making a mobile purchase 43.4% of users agreed, 39.1% disagreed while 17.4% were neutral. When asked if they want to see product recommendations responses were also split with only 34.7% agreeing or strongly agreeing, 47.8% disagreeing or strongly disagreeing and 17.4% neutral responses. While these options appeal to some of our users they do not need to be the primary features of the application.

Most users (78.3%) were willing to let an application use GPS to detect their location. The median response was Agree for this question and the standard error was .09. When asked how likely they were to use this feature in a later question, most of the

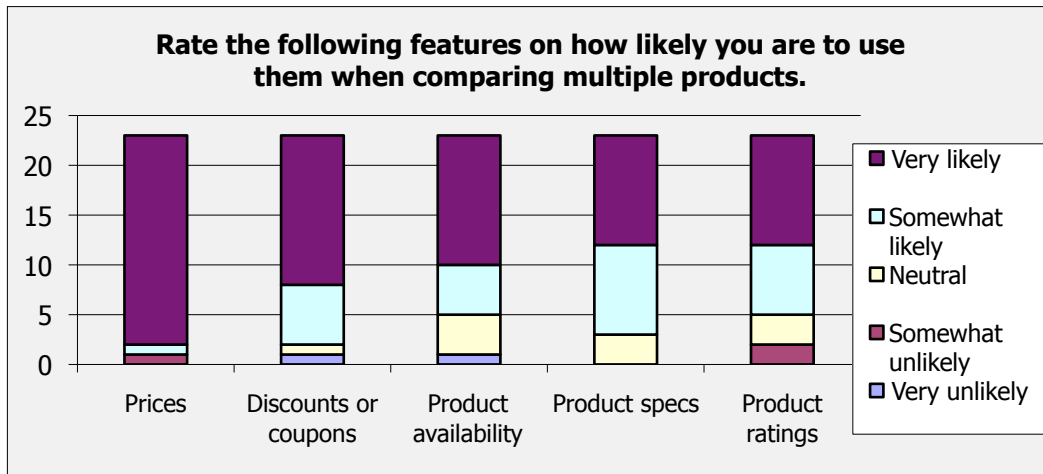
same users said they were very likely or likely to use this feature. This is shown in the chart below.

Rate the following features on how likely you are to use them when using a mobile shopping application		I am willing to let an application use GPS services to detect my current location Agree or disagree		Response Totals
		Strongly agree	Agree	
The app recognizing my location recognition thru GPS	Very likely	37.5% (3)	20.0% (2)	
	Somewhat likely	37.5% (3)	30.0% (3)	
	Neutral	12.5% (1)	20.0% (2)	
	Somewhat unlikely	12.5% (1)	20.0% (2)	
	Very unlikely	0.0% (0)	10.0% (1)	
		8	10	18

We asked users to rate a number of features on how likely they were to use them in a mobile application. The features users said they were very likely to use were product details (91.3% said very likely / 4.3% likely), notifications after purchase (85.2% / 17.4%), product images (69.6% / 21.7%) and product availability (69.6% / 21.7%). Many users were also likely to use ratings (52.2% very likely / 30.4% likely), recommendations (21.7% / 30.4%) and product comparisons (13% / 52.2%). The lowest ranked feature was saving items to lists where 60.9% were neutral or unlikely to use.

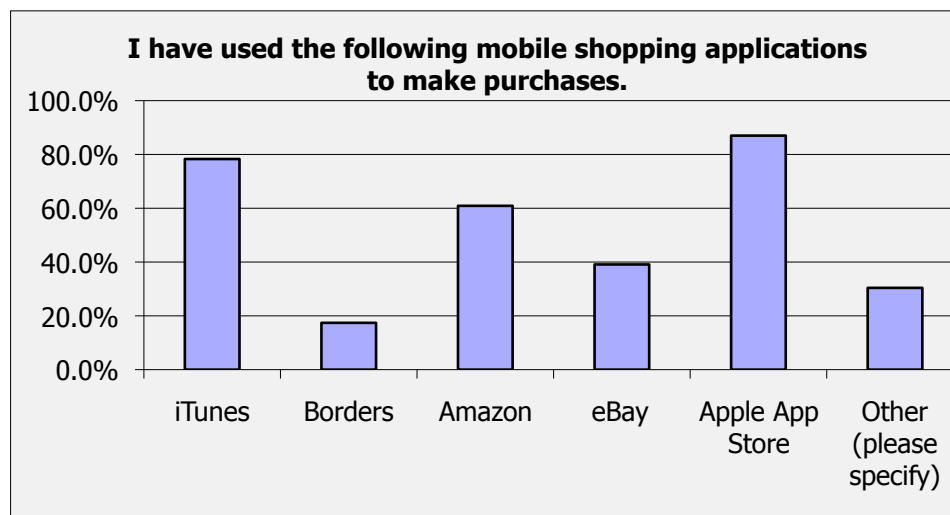


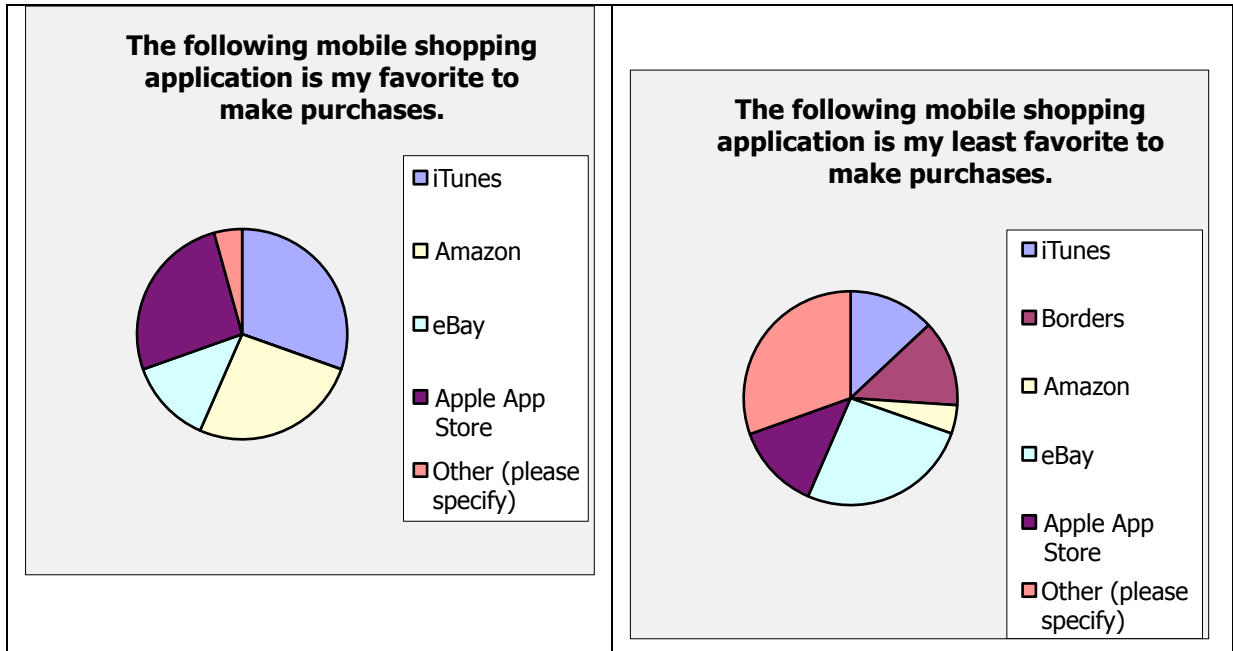
When asked what features they would most likely use when comparing multiple products, the features users were most likely to compare were prices (91.3% very likely), discounts (65.2% very likely) and product availability (56.5% very likely). Product specs (47.8% very likely) and ratings (47.8% very likely) were also likely to be compared.



Applications

We also asked users which applications they have used and which are their favorites and least favorites. Many users had used iTunes (78.3%) and the Apple App store (87%) as well as Amazon (60.9%) and eBay (39.1%). The most common favorite applications were iTunes (30.4%), Amazon (26.1%) and the Apple App store (26.1%). For least favorite applications the eBay application (26.1%) was the mode or most common response.





User Shadowing Results

During the course of the study two participants were shadowed while making a mobile purchase. The first participant A performed the purchase using the Apple App Store mobile shopping application and the second, participant B, used a web browser. The first participant had relatively little difficulty while making the purchase while the second had such a great degree of difficulty that they decided not to complete the purchase. Both participants seemed to rely heavily on the visual product descriptions for their purchases. In addition both participants sought out additional details for items they purchased. Participant A used recommendation features in order to discover a product to purchase. Participant B already had a product that they were looking for in mind and relied on search features. Participant A was able to effortlessly use horizontal scrolling features to examine the list of products. Participant B had difficulty reading a vertical listing of products as they were not able to determine which descriptions matched which product. Participant B had further difficulties as the site they were accessing frequently had 404 errors and frustration led them to attempt the purchase at another site. The only main difficulty participant A seemed to encounter was the labeling of a button with the price instead of the term Buy which they felt better fit their mental model. Participant A purchased the product using an established account with saved information, Participant B commented that they would have used their established web account but error messages made them feel the site was not working. Participant B described the comparison between the pricing on the second store being high in comparison to the first but still lower compared to shopping in store. However, due to their inability to purchase at the first site decided not to purchase the product.

Conclusion

During the course of this study our team reevaluated the requirements for our mobile shopping application. Through the use of a survey and user shadowing our team was able to determine that certain aspects of our initial design required revision. Our team was also able to discover that other features had a higher priority level than previously considered. Based off of survey results our team was able to gain a better insight on a population of mobile phone users. The surveys allowed us to determine how users felt about features our team identified in the initial interviews. The survey allowed our team to obtain quantitative results that assisted us in examining the levels and importance that users placed on certain design aspects. Our shadowing efforts helped to solidify the direction of certain features by viewing firsthand how users interacted with the systems. This assisted the team in understanding additional difficulties and benefits that users experienced in person but may not have been able to articulate in the original interview process. Using the results of these efforts our team was able to revise our system requirements and create user scenarios to assist us in the next phase of development.

Appendix I - Online Survey

Introduction

You are being asked to participate in a research study being conducted by Robert Garcia and Kristen Sienkiewicz, students at DePaul University. You are being asked to take the following survey about your experiences with mobile phones and shopping applications. This survey will take approximately 10 to 15 minutes of your time. The survey will consist of a series of questions about your mobile application use and shopping habits. The survey will include questions about your experiences with these applications along with questions on preferences and other applications used. You can choose not to participate. Data collected will be used for the purposes of a class assignment and will be entirely anonymous. No identifying information will be collected for this study, nor will any information be published in any public proceedings. There will be no negative consequences if you decide not to participate or change your mind later about your participation.

If you have questions about this study, please contact Kristen Sienkiewicz at kristen@treefishcreations.com or Robert Garcia at rgarcia@cs.depaul.edu. For further information about the project you can contact professor Xiaowen Fang at xfang@cdm.depaul.edu.

Page 1 – Background Questions

1. Do you own a Smart Phone?

Yes

No

If yes, what type?

[If No participants will be terminated after background questions]

2. Have you made a purchase from your Smart Phone?

Yes

No, but I would purchase from a Smart Phone

No, I would not purchase from a Smart Phone

[If they would not purchase participants will be terminated after background questions]

3. Have you purchased with a mobile application or a mobile browser?

Mobile Application

Mobile Browser

Both Mobile Application and Browser

Not applicable, haven't purchased

[If they have only purchased thru a browser or have not purchased participants will be terminated after background questions]

4. Which age range do you belong to?

under 18

18-25

26-35

36-45

46-60

over 60

[If under 18 or over 60 participants will be terminated after background questions]

Page 2 – Questions

Please indicate whether you agree or disagree with the following statements.

1. Price comparison is an important feature of mobile shopping applications.

Strongly agree/Agree/Neither agree or disagree/Disagree/Strongly disagree

2. I prefer shopping using a mobile browser vs. using mobile shopping applications.

Strongly agree/Agree/Neither agree or disagree/Disagree/Strongly disagree

3. Images used in current mobile shopping apps need to provide better product detail.

Strongly agree/Agree/Neither agree or disagree/Disagree/Strongly disagree

4. I am satisfied with mobile application error handling.

Strongly agree/Agree/Neither agree or disagree/Disagree/Strongly disagree

5. I would prefer errors to be handled automatically instead of receiving error message feedback.

Strongly agree/Agree/Neither agree or disagree/Disagree/Strongly disagree

6. Errors in mobile applications make me reconsider purchasing through that application

Strongly agree/Agree/Neither agree or disagree/Disagree/Strongly disagree

7. Lack of stability make me less confident about purchasing via mobile apps.

Strongly agree/Agree/Neither agree or disagree/Disagree/Strongly disagree

8. Uncertainty of whether purchases are complete make me less confident about purchasing via mobile apps.

Strongly agree/Agree/Neither agree or disagree/Disagree/Strongly disagree

9. Mobile shopping applications I have used effectively describe the products I want to purchase.

Strongly agree/Agree/Neither agree or disagree/Disagree/Strongly disagree

10. When purchasing an item on a mobile app I check multiple stores before purchasing

Strongly agree/Agree/Neither agree or disagree/Disagree/Strongly disagree

11. When using a mobile application I like to see product recommendations based on my past shopping habits.

Strongly agree/Agree/Neither agree or disagree/Disagree/Strongly disagree

12. I am willing to let an application use GPS services to detect my current location

Strongly agree/Agree/Neither agree or disagree/Disagree/Strongly disagree

Page 3 – Questions

Please tell us about the applications you have used.

1. I have used the following mobile shopping applications to make purchases.

iTunes

Borders

Amazon

eBay

Apple App Store

Other (please specify)

2. The following mobile shopping application is my favorite to make purchases.

iTunes

Borders

Amazon

eBay

Apple App Store

Other (please specify)

3. The following mobile shopping application is my least favorite to make purchases.

iTunes

Borders

Amazon

eBay

Apple App Store

Other (please specify)

4. Rate the following features on how likely you are to use them when using a mobile shopping application

For each item ratings are: Very likely/Somewhat likely/Neutral/Somewhat unlikely/Very unlikely

Product images

Product details

Product ratings

Product comparison

Product availability

Product recommendations

Saving to Lists

The app recognizing my location recognition thru GPS

Notifications after purchase

5. Rate the following features on how likely you are to use them when comparing multiple products.

For each item ratings are: Very likely/Somewhat likely/Neutral/Somewhat unlikely/Very unlikely

Prices

Discounts or coupons

Product availability

Product specs

Product ratings

Thank you page

Thank you for taking our survey, your feedback is very valuable to our research on mobile shopping.

Appendix II - User Shadowing Data

Participant A - A painless mobile app purchase

The user observed made a purchase from the Apple App Store. His intention was to purchase a new game for his iPod touch. He started by browsing the hottest games and then genius recommendations, which are base on usage and purchasing patterns. He looked at several games before choosing one to purchase. When browsing the list of games he would choose some to see more details about. For each game detail page he read some of the description at the top and then scrolled down to see screenshots of the game. In this area of the page he scrolled horizontally between several game screenshots. These visuals gave him the most info on what the games would be like, the images filled the screen and provided a lot of detail. After reviewing screenshots he would return to the top of the page and then click a button to return to the other game results. Once he decided to purchase a game he returned to the details screen for that game. He scrolled to the bottom of the page and then back to the top and clicked on the price. He commented that he expected a “Buy” button but when he hadn’t seen it he remembered that you need to click on the price, which then changes to “Buy”. He has an existing store account with Apple so went clicking “Buy” he is prompted for his password. He types this is with the touchscreen keyboard. The device returns him to the main interface with the new game icon to show that the application is installing which confirms that his purchase is completed.

Participant B - A half hour of frustration

Participant B was shadowed while attempting to purchase boots from a mobile device. The participant would shop often online and occassionally on her mobile Blackberry Storm. The participant was interested in buying some boots this day at a local ice cream shop and decided to purchase via her mobile phone. The participant begins the process by moving through desktop icons and opens up a browser window. Facebook displays and the participant clicks to open up another window. The next window opens displaying a yahoo search page. The participant types in zappos.com and using a scroll wheel selects the page. During waiting time the participant sips on a drink, relatively calm. The participant finds and opens the page. In the page the participant scrolls to a search window and types 50 505 stuart and presses the search option. The participant receives a page and scrolls the links but doesn't find what she is looking for. This process continues for several minutes as the participant searches, scrolls and returns to the original search window. Occassionally, the participant comes a across a bad request page and shakes her head. Eventually the participant locates an alphabetical listing for products and selects an item. The participant at this time is becoming increasingly annoyed with the options presented and the wait. One one page the participant finds a stuart wetzman link and opens the page. The page contains pictures and names arranged vertically. She scrolls through several pages locating the item she wants. She comments that she can't tell which price and information is for which image as there are descriptions both above and below the image. When she attempts to view the descriptions for the different boots, she gets page not found error messages and

shakes her head in frustration. She begins accidentally scrolling too far on the page as the mouse wheel is also the mouse click button. Locating the boots she wants she attempts to get into the page but receives a 404 error message and she states it won't let me buy them. Frustrated she leaves the page and begins a new search for Bloomingdales. On bloomindales site she finds a search option, but when she clicks receives a popup menu with different options. When the options don't return what she wants she shakes her head in frustration. She continues to receive different pages with different sized fonts and attempts to scroll through them quickly. She finds a link that says site map on one and proceeds to it. She scrolls reading information and finds a link that says shoes but seems annoyed when it doesn't return what she expects. She says something random about "not working". She finally finds an image that depicts shoes and says "oh yes", in an accomplished way. She then seems disappointed when she doesn't discover what she was looking for but follows a breadcrumb menu in reverse to another window with another search feature. She types in this search window but scrolls the page because something caught her attention. After scrolling through quickly she returns to the search and clicks submit. She then sees a page with a horizontal listing of descriptions and pictures. She uses an option at the top to sort the results by a-z. She then goes through the listing to locate the boots. She finds boots similar to the ones she found on the other site. She opens the page and changes some options on size and color. She adds the boots to the shopping cart and remarks on the price. She states that its too expensive and decides not to purchase the product. Seemingly frustrated she closes the browser and returns to her drink.

Appendix III – Team Member Contributions

Robert Garcia –

Survey question creation, Introduction, Methodology, Survey Overview, User Shadowing Results, Conclusion, Document editing

Kristen Sienkiewicz –

Survey question creation, Survey Results, User Shadowing Overview, Executive Summary, Results and Discussion, Document editing