Minna An
Megan McCarthy
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## My Fuelly Mobile Tablet Application:
## Usability Testing Reveals Consumer Preferences

<u>Introduction</u>

Technological theorists study the relationships between technological advancements and

society. One physical manifestation of this relationship is exemplified in user group testing.

When developers begin to work on creating a mobile application, or improving upon an existing

one, they often set up usability testing as part of the iterative development process. Wireframes

are developed into a working prototype, and it is during this time of initial development that

users (preferably from the target user group) are called in to complete a series of tasks using the

prototype and then asked follow-up questions about their personal use of the application as well

as their overall experience.

<u>The Test</u>

In an increasingly more consumer-driven society, usability testing plays a key role in developing

technology that will be useful for end-users and in turn, successful in the marketplace.

Technological theorists Jennifer Daryl Slack and J. Macgregor Wise agree that in today's

climate, "consumers do not passively accept every product that is offered… if there is no need for

the technology, it will not sell" (Slack 152). Usability testing plays a key role in developing a

technology, in this case a mobile application, that will be useful to users and serve a need in

society.

Aiming to develop an inclusive and successful usability test, many different points needed to be

taken into consideration. While research in usability is still a developing field of study,

researchers have discovered there is a trend in the issues that tend to arise in usability testing, and how these challenges should be incorporated into usability testing design. According to Dongsong Zhang and Boonlit Adipat, researchers in usability testing specific to mobile applications, the following five questions need to be addressed and taken into consideration when building a usability test (Zhang 295).

1. Can proposed presentation methods help users easily search for/browse/understand specific information of their interest on mobile devices?
2. What are appropriate designs of menu and link structures that help users reach a destination page easily (navigation)?
3. Can users easily carry out specific activities (e.g., query searching, filling form, making notes) of an application on mobile devices?
4. What kind of data entry methods can enable users to enter data easily and quickly?
5. How well can mobile applications be used, considering mobile context, mobility and slow network connection?

Other limitations that should be taken into consideration when reviewing results include user-based problems, which include skill-based, rule-based and knowledge-based levels of performance (Fu 137). During the mobile application prototype development and usability testing process, we aimed to answer the defined issues in usability testing listed above, while also following questions framed by the several theories discussed in class:

1. What do users expect to accomplish by using the My Fuelly mobile application?
2. How can these expectations be offered through the My Fuelly mobile application?
3. Will expectations change over time? If so, what factors contribute to such changes?
4. If the prototype were developed into a real mobile application, how do we make "My Fuelly" sell, based on user/consumer preferences and expectations?

For this specific project, three users agreed to participate in usability testing for the "My Fuelly" mobile application prototype. Due to time constraints, one round of usability testing was conducted, in which users completed three tasks and were then asked a series of follow-up questions about their experience (See Appendix A for tasks, questions and answers).

By conducting this usability testing, not only were we able to determine the best user-centered design for the mobile tablet application, but also to learn how user behavior shapes the development process.

The Results

During usability testing, we observed that overall, users did not have much difficulty navigating through the prototype while attempting to complete each task. All users were able to adapt and learn what the buttons meant, where they navigated to and how to indicate that they finished each task.

The overall opinion of the My Fuelly prototype, in terms of intuitiveness and ease-of-use, was that the mobile application was very straightforward, easy to learn, user-friendly and very intuitive. Mild criticism of the prototype included readability (i.e. making font darker) and the fact that it is indeed a prototype (i.e. users could not enter in information and store it in a database).

When asked if any improvements could be made, or what expectations users had for a mobile application such as My Fuelly, the results varied. One user indicated that the option to compare his vehicle (2002 Chevrolet Cobalt) with other users who had the same vehicle (e.g., year and gas mileage) would be very helpful and interesting, because then he would be able to determine where his vehicle should be in terms of fuel efficiency.

The same user also suggested that if the prototype were to develop into a real mobile application, that perhaps adding a "trip planner" functionality would be very beneficial. Such a feature would help the user plan a road trip using Google Maps and recommend appropriate refuel points based on his or her vehicle's fuel economy.

The Implications

Usability testing of our prototype aimed to learn from the users' immediate and reflective responses and insight into the usability and usefulness of the mobile application in it's design, and how the next iteration of the application can be transformed to build a more successful platform. Appendix B shows how our initial designs were influenced by user input offered in usability testing. Usability researchers Frances Johnson and Jenny Craven explain the importance of usability testing in technology development.

> A successful system is one which engages the user in a meaningful interaction through functionality that supports the user in achieving their goals. It is within this context that usability studies are valuable, not only to make improvements to the 'look and feel' of the interface, but also to establish functionality... usability, with functionality at its core, asks not only is the system usable, but also is it useful and if so, how is it used. (Johnson 229)

Our mobile application, "My Fuelly," aims to take into account how the potential consumer would use the system, as well as to gain insight into their behavior in using the system in jopes to create a successfully, marketable application that is effective in it's purpose, easy to use for a broad audience and satisfaction to the market we are trying to serve. Usability testing embodies technological theories of how society and consumer-use can influence technology and, we would

like to hope, how our technology can influence conscientious driver, in other words our target user audience.

Researcher Zhang describes the importance and great influence that testing can provide in mobile application usability tests.

> Because developing mobile applications with an easy-to-use interface is critical for successful adoption and use of applications, one of the important research issues is regarding how to conduct an appropriate usability test using mobile devices in a wireless environment... it provides a third-party assessment of the ease with which end users view content or execute an application on a mobile device. An effective usability test has to be able to elicit feedback from users about whether they use an application without (or almost without) difficulty and how they like using the application, as well as to evaluate levels of task performance achieved by users. (Zhang 294)

Conclusion

Usability testing is an effective and accurate method to measure technological determinism and how consumer behavior/consumer choice shapes a technology and determines the success or failure of that technology. By conducting usability testing for the "My Fuelly" mobile application prototype, we were able to design a prototype that was focused on user abilities and thought processes, determine what users have come to expect from similar prototypes, what they find useful about similar prototypes and how to move forward with the prototype if it were to become a real product for the market. This process has helped us better understand new media concepts discussed in class and allowed us to apply them to real-world scenarios. As a result, we have become better prepared to not only anticipate how technologies affect society and culture, but also how to properly adapt them for the economic market.

## Appendix A: Usability Testing
by Megan McCarthy & Minna An

Thank you for participating in this study. You will be asked to complete a series of tasks using the prototype, during which we appreciate as much feedback as possible. Each time you believe you have completed a task, return to the homepage so that we know you are done.

Tasks
1. Imagine that you are refilling your gas tank and want to record it (miles per gallons) in the app. Use the prototype to complete the task.
2. Imagine that you wish to change your username and password. Use the prototype to complete the task.
3. Imagine that you wish to view the fuel economy of your vehicle, as it has evolved over time. Use the prototype to complete the task.

User #1: Male, Age 27, proactive and advanced technology user, owns and drives a vehicle, uses print log version of recording and tracking gas mileage.

User #2: Female, Age 27, reactive and intermediate technology user, owns and drives a vehicle.

User #3: Male, Age 53, adapted and "must-use"/novice technology user, owns and drives a vehicle.

Follow Up
1. What did you like most about the app? What did you like least?
   a. Best:
      i. Very straightforward, not hard to figure out. Buttons/navigation is excellent;
      ii. User-friendly, pretty self-explanatory;
      iii. Nothing in particular;
   b. Least:
      i. Maybe readability (make font darker), nothing much that they didn't like;
      ii. That it's a prototype…;

2. Did you generally find navigation between features easy and intuitive?
   a. Everything was very intuitive, no problem learning it whatsoever;
   b. Yes, everything was easy and intuitive;
   c. Yes;

3. Do you have any additional thoughts on how we can improve it? Were there any other features that you expected or would like to use on an app like this?
   a. Improvements:

        **i.** Comparing other users/user group (similar vehicles, etc.), utilizing a database, compare where your vehicle should be; Adapting to specific operating systems (Android vs. Apple, etc);

        **ii.** Maybe adding a voice feature so that it talks to you;

        **iii.** Make buttons work…;

**b.** Expectations:

        **i.** Trip planner (based on economy, Google Map trip), although that might be far along the road in the prototype development;

        **ii.** Nothing else really, thought it was fine;

        **iii.** No more expectations;

**Appendix B: Prototype Screenshots**

In our original designs, we created a mobile application based on the most popular functions on the fuelly.com website in addition to standards amongst other mobile applications, including user settings and personalized information. Below are examples of our original wireframes, outlining our original plans for the My Fuelly mobile application.



This sample wireframe from our initial design shows the personal user-centric page that incorporates the vehicle information for the user.
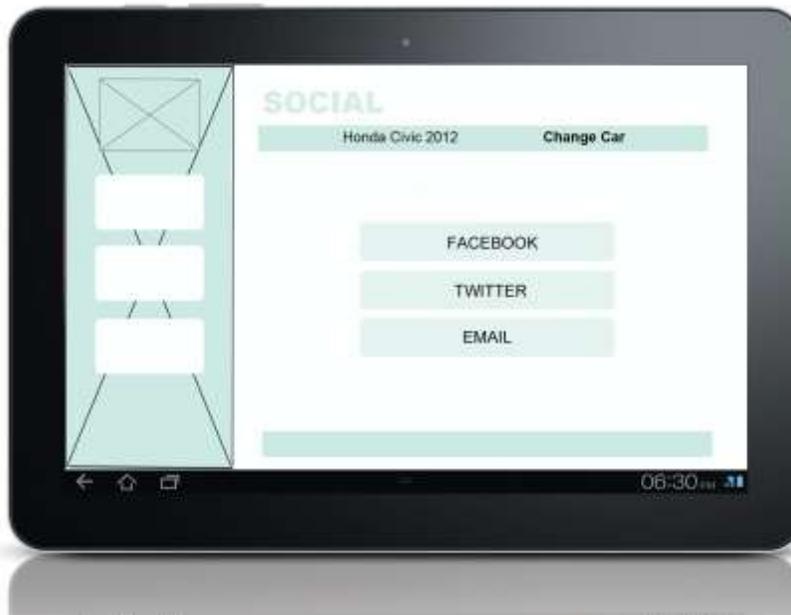


This page from our initial wireframe designs include "social connectivity" information, allowing the user to share their vehicle's information on popular networking sites and via email.

This screenshot, from our working prototype, shows the main "My Fuelly" page that greets users. This is the landing page from which users can begin logging in their latest trip to the pump, or view their history of gas/mileage use.



The "My Tracker" page was redesigned from user input to be more visually appealing, keeping in a log of gas/mileage use that goes back enough to convey patterns in the user's history , without providing too much information in the space allotted.
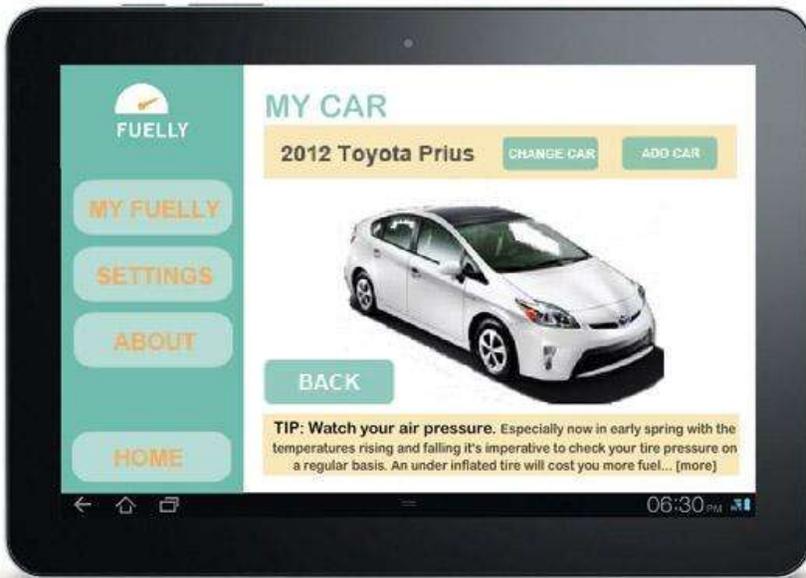
This page, "My Car", allows users to log in information specific to the car they're using. We updated this page from our original wireframes to incorporate a visual element, so that users could further personalize the application to their personality.



"Display Units", is a reflection of the personalized settings available on the Fuelly.com website. We included this page in our mobile application so that user could experience the same ease-of-use that comes with membership on the fuelly.com website.

# References

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