Design Challenge: Feature

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Table of Contents

The Big Picture

When designing the UI/UX for an infotainment system, it helps to take a step back and ask ourselves:

- **What do we, as users, want to be able to do in our cars and what do we want our cars to be able to do for us?**

As designers, we can frame this question as:

- What do users naturally want to do in their cars?
- How do they naturally want to do it?
- How can UI/UX facilitate this and enable users to meet their goals in a way that is
    - Intuitive,
    - Seamless,
            AND
    - Safe?

A great infotainment system has multiple factors:

- Information
- Connectedness
- Ease of access
- Safe to use
- Enjoyable/entertaining
- Smooth, integrated into the driving experience
    - Keeping user *in* their experience, not taking them *out* of it (key not only for good UX, but also for safety!)

Ultimately, this offers the potential to turn cars into two things:

- Get us where we want to go (destination),
        AND
- Have an enjoyable and safe experience along the way (journey)

3 overall goals in mind as we design this UI:

ENABLE

EMPOWER

ENJOY

An Example Scenario

Meet Jenna! Jenna just graduated from UW and decides to celebrate by taking a long road trip. She decides to drive from Seattle to San Francisco to enjoy the beautiful Pacific Coast Highway and meet up with some friends in SF. She's also celebrating getting a brand new EcoCar!

Jenna starts her road trip. After a few hours of driving, her car's infotainment system lets her know that she will start to run low on battery soon. She's not familiar with the area she's in, but she doesn't have to exit the highway, pull over, whip out her iPhone and guess which electric charging stations she can reach. Instead, the car tells her where she can find charging stations on her route based on the amount of battery she has left, upcoming traffic, and road conditions. Jenna doesn't want to stop yet, so she picks the last possible station that she can reach and recharges there. Even though there's some traffic and road closures on the way, she makes it there because her car knew this and took this into account.

Jenna gets to San Francisco and has an awesome time visiting her friends. As she's driving back, she finds herself very low on battery (with only a few miles left!). Before she starts to panic, her infotainment system tells her where is the closest station she can reach, connecting all relevant pieces from the car's system and Internet-informed navigation. She makes it to the station with just a mile to go!

As she nears home and looks back on how the road trip went, Jenna is satisfied that her EcoCar took care of the planning around battery recharging, so that she could focus on enjoying her trip. In fact, her car had more precise information than she had access to, in terms of traffic and road conditions, so she was confident that her car was helping her make the best possible choice given her goals at all times! She never had to doubt, problem-solve, or panic. Instead, she could completely immerse herself in the experience of an incredible road trip, which is why she uses her car in the first place: to get her where she wants to go and have a great time on the way.

The Feature

> *Note that the following description refers to gas cars/stations, but the same concept applies to electric cars/charging stations.*

To tackle this design challenge, I asked myself the big-picture question above from a futuristic standpoint:

- **What do we *wish* our cars could do for us, that they currently *don't*?**

To answer this, I turned to my own experience and those of my friends and family. One feature I wish I had in my car was more support from the car's system when the fuel tank is low. Currently, our cars only tell us that we're running low on fuel (in other words, they tell us that there's a problem). But they don't tell us how to fix it, contrary to our natural reaction and expectation. And they're not context-aware of our goals and environment, so *we* have to connect all the pieces and plan ahead, rather than the car doing it for us.

A case in which this is applicable is when the user is traveling away from home and in unfamiliar territory. As an example, while driving home after a road trip recently I discovered I was low on gas. Eager to get home, I tried to find gas stations nearby using my mobile Google Maps application. But none of them were on my route, and I was frustrated that the app wanted to take me out of my way and add to my travel time, rather than showing me stations that were on my way and in range of the amount of gas I had left. Eventually, I gave up and had to ask someone. Certainly my phone (let alone my car!) couldn't provide the information I sought, connecting my car, my goals and my environment.

As another example, consider business travelers who want to fill up their fuel tank when they are returning a rental car to the airport. Often, their primary goal is simple: figure out where the closest fuel station to the airport is. A feature that empowered them to achieve this goal, particularly when on a busy schedule and time is precious, would be helpful.

What these examples illustrate is that ideally, our cars would be context-aware: they would connect our car's fuel status with our goals and our environment. They would anticipate when we will start to run low on gas and help us get more gas conveniently, so that we do not find ourselves in a situation where we have almost no gas left. And they would help us if we do run out of gas.

With the advancement of Internet of Things, this connectedness is rapidly becoming a reality and offers huge potential. By leveraging IoT, we can offer an empowering UI that predicts and enables users' natural next steps in these situations. Our cars can be more intelligent because the navigation system is connected to the Internet all the time, so issues due to traffic, road closures, weather, etc. that will affect how far we have to go when gas is low can be taken into account. Internet connectivity is fundamentally necessary for this feature (and others in an advanced infotainment system as well).

To address these considerations, I propose a feature called Predictive Refueling System (PRS). I had two primary goals of the feature:

- Address an issue that is important to drivers (low fuel level)
- Be an extension of our natural thought/action process and operate the way WE would think and act

There are two major scenarios when gas level comes into play for drivers, reflected in the two flows/use cases in the sketches:

- Flow/use case 1: car will soon start to run low on gas (not quite yet in crisis)
- Flow/use case 2: car is almost out of gas (in crisis)

In each scenario, PRS anticipates and facilitates what the user would want to know and do next, so that they can achieve their goals with a more positive experience.

In conclusion: running out of fuel is a stressful and sometimes panic-inducing experience that all users wish to avoid. A UI that connects car, user and environment – that reflects and enables what a user would naturally do in that situation, and *acts as we would want it to act* – would help prevent and reduce user distress and increase convenience. Furthermore, without fuel the car cannot fulfill the user's primary goal (i.e., to *get* somewhere) - so a feature such as PRS that helps the user maintain the fuel level is critical.

For flow sketches, please see "Feature – sketches.pdf"