FindACarFor.Me

Phase I Technical Report

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1 Motivation

While listing aggregators are already a consistent element of purchasing a vehicle—and while they provide thorough specifications on each make and model in the listing—there exists an inherent bias in a for-profit aggregator that FindACarFor.Me attempts to remove, especially with its dual focus on frugality and safety. Our product will be that comprehensive source for car buyers through its: location-specific listings and fuel stations, in-depth safety comparison for vehicles, and composite cost-to-purchase overview. Our intended (but not entire) audience are users with questions like the following:

1. What are listings near me that fulfill my criteria (make, model, safety, etc.)
    - How much will I spend on fuel if I drive *x* miles weekly?
2. Is my surrounding area properly equipped for my purchase of an electric vehicle?
    - What types of fuel are less expensive in my area?
3. What is the safest and most budget-friendly car for my son?
    - Where can I purchase affordable vehicles nearby?

2 User Stories

1. Safety Information
    a. *Story: I am the parent of a 16-year-old girl who is about to get her driver's license. I am very nervous about her driving, as car accidents are one of the leading causes of death in*

teenagers. I would love if your website had information about safety ratings for different cars, and if I could sort the list to see the safest cars.

b. We have hard-coded the Safety Data into our model page, but we will need to add data sourced directly from the API and add functions to sort.

c. Estimated: 20 minutes

d. Actual: Our sort function is incomplete, but the safety ratings are visible

2. Pricing

a. *Story: Hi, I am a full time student who works a minimum wage job. I need to buy a car to drive to work, but I can barely afford my tuition as it is. I would like to be able to see a list of the cheapest cars. Gas is also expensive, so I would like to be able to see the gas stations around me and be able to compare their prices.*

b. We have hard-coded the MSRP values for our listings into our model page, but we will need to add data sourced directly from the CIS API and add functions to sort. We are currently in the process of implementing the Google Places API to add fuel station locations, but for now that is also hard-coded.

c. Estimated: 2 hours

d. Actual: We are currently using a static API for the cars, so we can't sort by price

3. Charging Stations

a. *Story: Hi, I recently bought a Tesla Model X. I love this car, but I have been nervous to drive it because I am worried I will run out of charge and not be able to find a charging station. It would be very handy to be able to search charging stations by their location, so I can plan my trips and make sure I'm never stranded without a way to charge my car.*

   b. We are currently in the process of implementing the Google Places API to add fuel station locations by location, but as of now we have hard-coded the information to be based around Austin, TX.
   c. Estimated: 2.5 hours
   d. Actual: Google Places API hasn't been dynamically implemented yet

4. Car Listings
   a. *Story: Hello, I have been trying to buy a Honda Civic for some time now, but I can't seem to find any dealership that has them in stock. It would be great if your website had a list of car listings I could search through to find a Civic for sale. Thanks!*
   b. We have hard-coded the makes and models for the vehicles for now, but we will be introducing a search function in the next phase.
   c. Estimated: 1 hour
   d. Actual: Our APIs are static as of now, so we aren't searching through the API—results will be limited to the three hard-coded cards

5. Electric vs Gas
   a. *Story: Hi, I want to buy a car, but I'm torn on if an electric or gas-powered car is better for my situation. I would love to be able to compare the attributes of different electric and gas-powered cars, so I can make an informed decision.*
   b. With regard to electric and gas-powered cars, our website will give users the ability to compare local gas prices with local charging prices, and the amount and distance of gas/charging stations relative to the user's chosen location. These

features are currently out of the scope of this phase, but they will be implemented in future phases.

c. Estimated: 20 minutes

d. Actual: We have partially implemented this feature, but not at a level where it can be compared side-by-side. We foresee that being much later.

3 Models

There are presently three models to compare vehicles with: fuel stations (EV charging and gasoline); car specifications by make, model, and year; and car listings from nearby dealerships. All the models are strongly related, with attributes to filter and sort on. Fuel stations are relevant to a consumer's decision between an EV and a gasoline-powered car, and they also expand on the cost-per-vehicle with fuel prices. Yearly car models are useful for general specifications and price averages, and to compare potential vehicles on a broad scale before seeking individual listings. The listings are often the final barrier for a car buyer, and we aim to clarify the process by supplementing the listings with fuel and vehicle information on the consumer's location.

1. Fuel Stations
    - *Filtered Specifically On:*
        - Distance
        - Price
        - Fuels Available: (EV / Gas / Diesel)
        - Rating

        - Gas Station Company (for rewards purposes)
    - Phone Number
    - Address (<city>, <state>)
    - Google Maps Link
    - Website
    - Opening Hours

2. Car Model Specifications
    - *Filtered Specifically On:*
        - Safety Ratings
        - Average MSRP
        - Miles Per Gallon
        - Make / Model / Year
        - Fuel Type
    - Vehicle type (Sedan, truck, SUV, crossover, station wagon)
    - VIN Number
    - FWD/RWD/AWD/4×4
    - Car Manufacturer Website
    - Model Recall History

3. Car Listings
    - *Filtered Specifically On:*
        - Price

    - Mileage
    - Make / Model / Year
    - Fuel Type
    - Location
- Vehicle type (Sedan, truck, SUV, crossover, station wagon)
- Car features
- VIN link to decoder
- General Version of Car
- Dealership information

4 RESTful API

We combed the available free or student-oriented API options for vehicle data, and we decided to pull data from openchargemap, Google Places, NHTSA, and CIS. Using Postman, we created a client-side API for our own project, documenting the paths, variables, and query options for each schema that we implemented.

5 Tools

For the front-end side of our web application, we employed react-bootstrap for the UI, react–router-dom for the URL subpaths and model pages, and Node.js for general website programming. As for the back-end, we used Postman to handle our API documentation. With a special focus on GitLab Boards, our workflow was dependent on the stage that our issues were in. This development strategy allowed us to streamline and prioritize as needed—especially in

coordination with Gitflow, a system that kept us safe from issues in merge requests and branching.

6 Hosting

Our hosting process began with Namecheap, a domain name vendor that provides free .me URLs to students. To deploy our website, we used AWS Amplify. The full-stack solution service comes with a pre-deployed HTTPS service, so it was simple to link our domain securely and ensure we had a TLS/SSL certificate. In order to host both a development branch and a main branch as accessible websites, we created a build configuration in Amplify that deployed our websites from our GitLab commits on the aforementioned branches.