Hitch Design

Motivation

Hitch is an app to allow users to easily find people to share rides simply by entering a pickup location, destination, and a date.

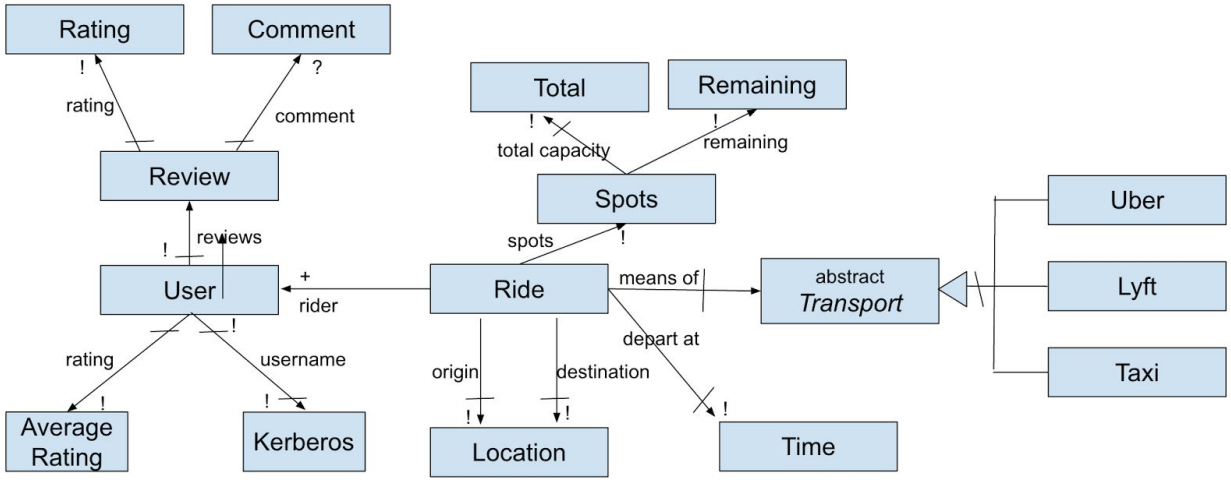
Purposes:

- Save money: Users can split the cost of an expensive ride
- Find reliable users to share rides: Allow users to find other people going to and from the same place to share rides
- Plan rides: Apps like Uber or Lyft allow users to share rides, but don't allow them to plan beforehand. We allow users to find others who are also looking for rides in advance.
- Meet new people: Users can meet other students from MIT that they may not know through planning rides together.
- Currently, people may ask their friends or email out to mailing lists asking if anyone would like to share rides. However, this is not a centralized way to plan and find rides.

Concepts

- Ride
  - Purpose: To save money, to plan rides in advance, and to meet new people
  - Operational principle: A user can input their pickup and destination locations and departure time, and either join an existing ride or create a new one in order to find people going to and from the same place as you to share a ride with.
- Review
  - Purpose: To find reliable users to carpool with
  - Operational principle: For quality assurance, after a user has participated in a ride, they will be prompted to leave reviews for users they have carpooled with, by assigning them a rating on a scale of 1 - 5 and an optional comment. These reviews are then viewable to other Hitch users.
  - Anticipated misfit: We cannot guarantee that users will join overlapping rides. We've decided that it is the user's responsibility to avoid this situation. If they do not, then the other users that they were supposed to share a ride with may give them a bad review for not showing up.

Data Model



Textual constraints:

1. A user can only review another user once after they share a ride together.
2. A ride is deleted if its users all leave.
3. A ride is closed either when it is at capacity or when the current time is past the departure time.
4. A user is automatically approved for a ride, but users can vote to remove a user (for example if he has low ratings).
5. A user's average rating is the average of the ratings of all the reviews about them.

Insights:

1. In order to encourage commitment and ensure reliability, a ride's time and locations cannot be changed once the ride has been created.
2. Users may edit their rating and comments, but the ratings and comments will always belong to the same review for the same user.

Security Concerns

Security Policy (goals for what behavior we intend to support):

- Only MIT students can register for an account using MIT certificates.
- Users can only join rides with their own accounts
- Only users who have joined a ride can access the secret passphrase.
- Users can only rate other users once after each time they share a ride (if they are still part of a ride after the departure time)

Threat Model (assumptions about the capabilities of attackers):

- There isn't much sensitive information on Hitch, so we don't have to worry as much about attackers.
- Users can construct requests (curl, Postman) to join or delete other users' rides

Prevention:

- Sanitizing inputs from forms such as reviews, signup or signin, and ride locations to prevent code injection

Cross Site Scripting

- We will HTML escape before inserting untrusted data into HTML element contents. We will also use templating escape features (from EJS or Handlebars).
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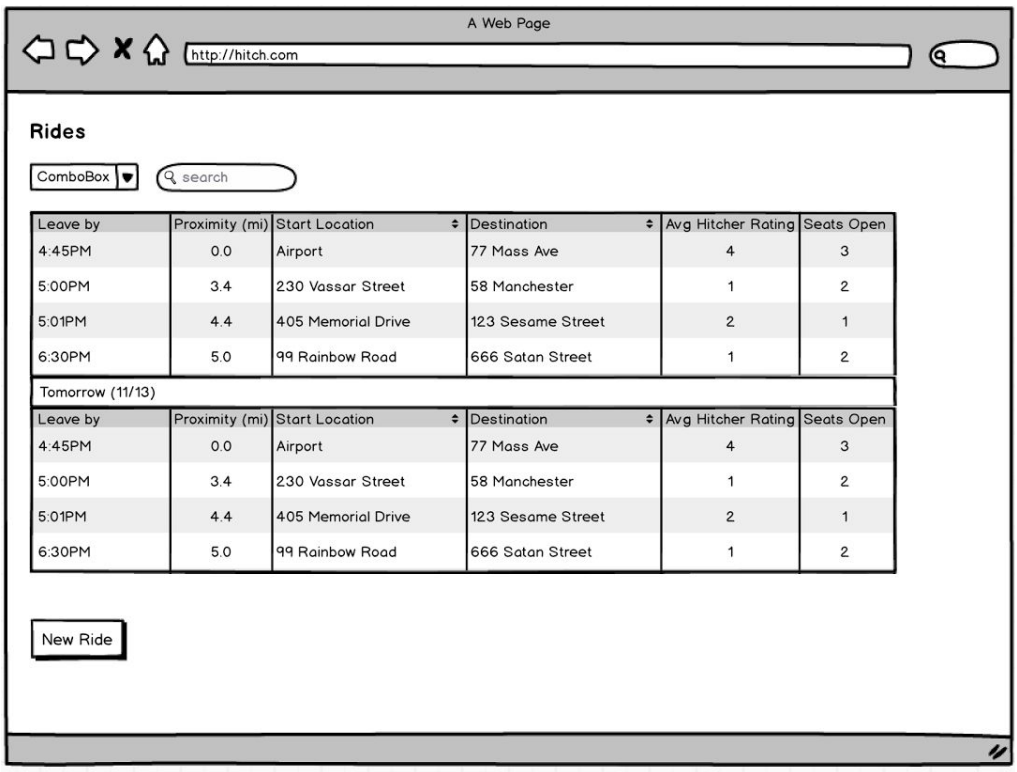
User Interface

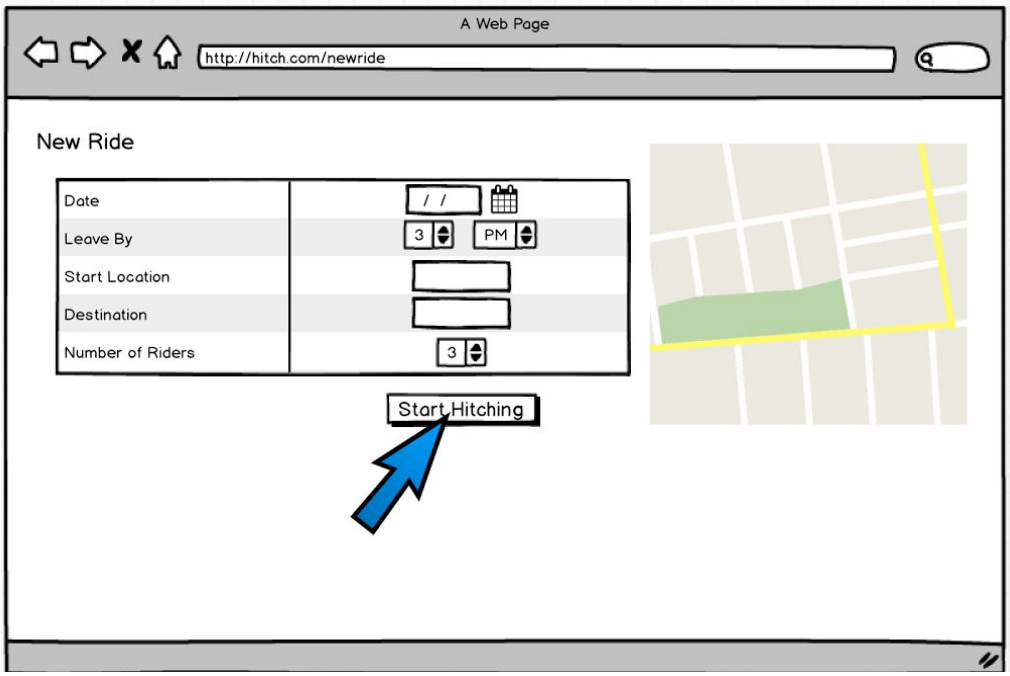
Error handling shown, for validation errors and anticipated failures

- Wireframes

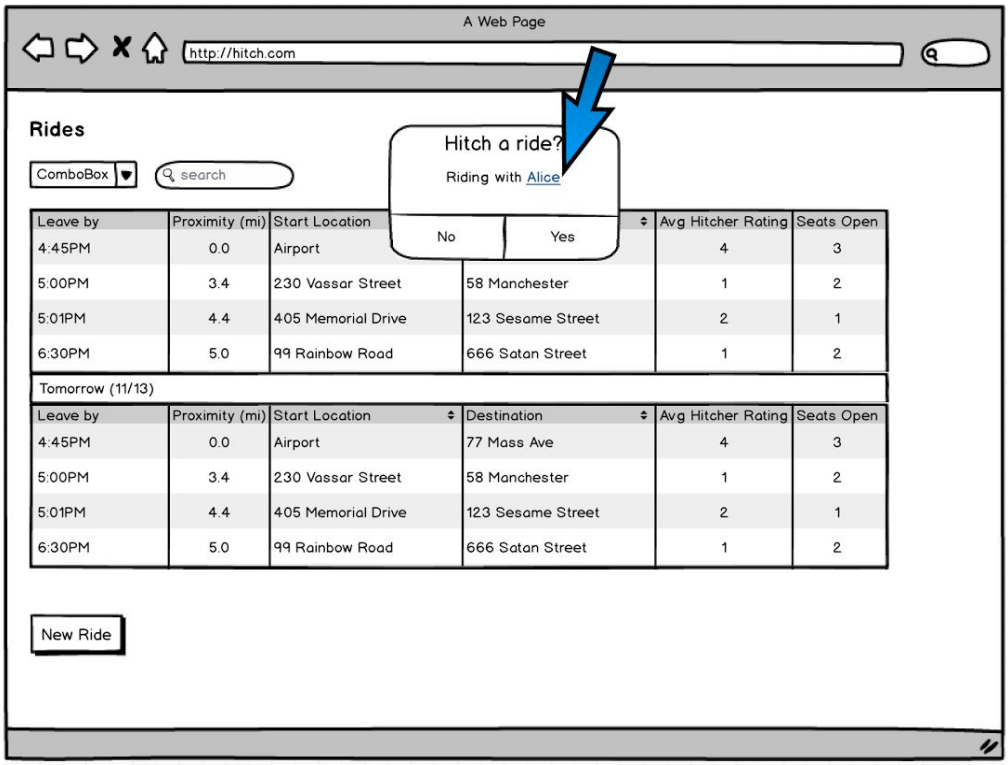
Home page where you can view all rides



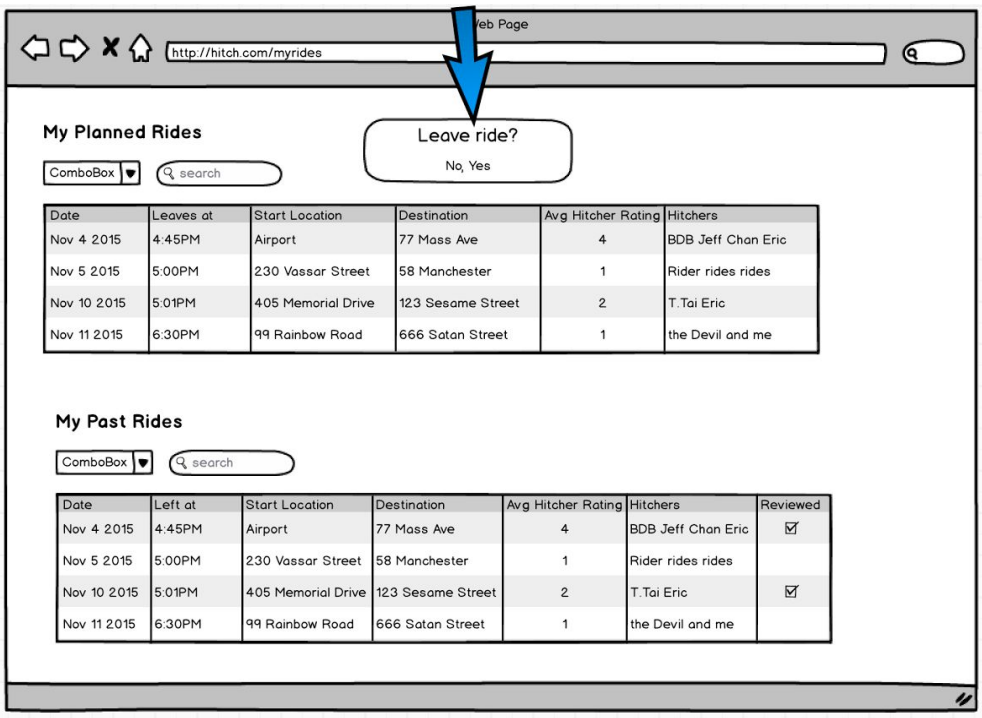
Creating a ride



Hitching a ride

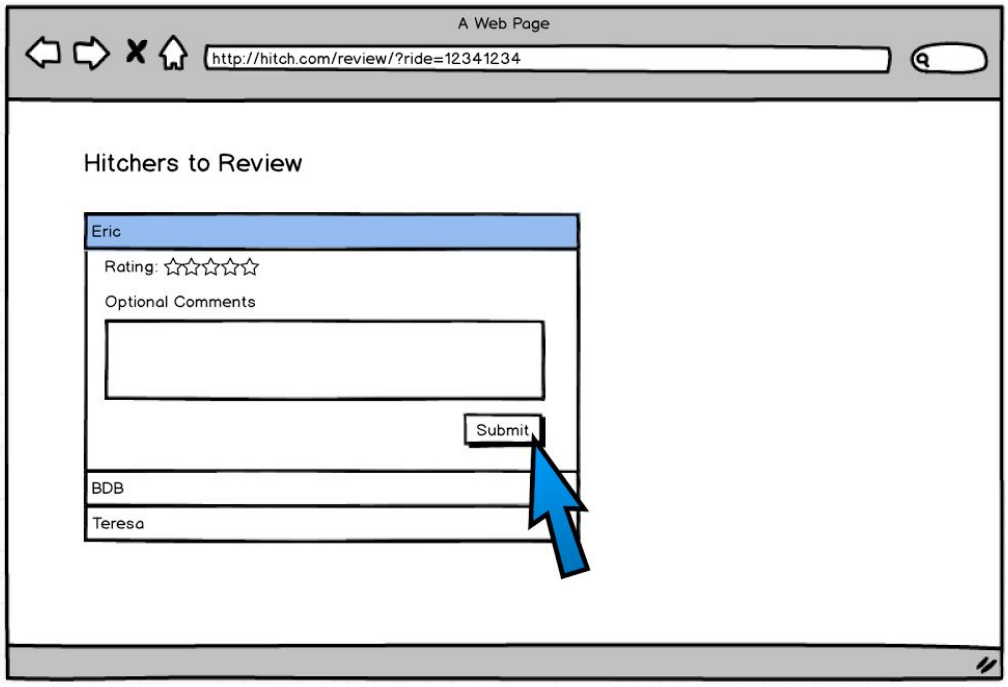


Leaving a ride

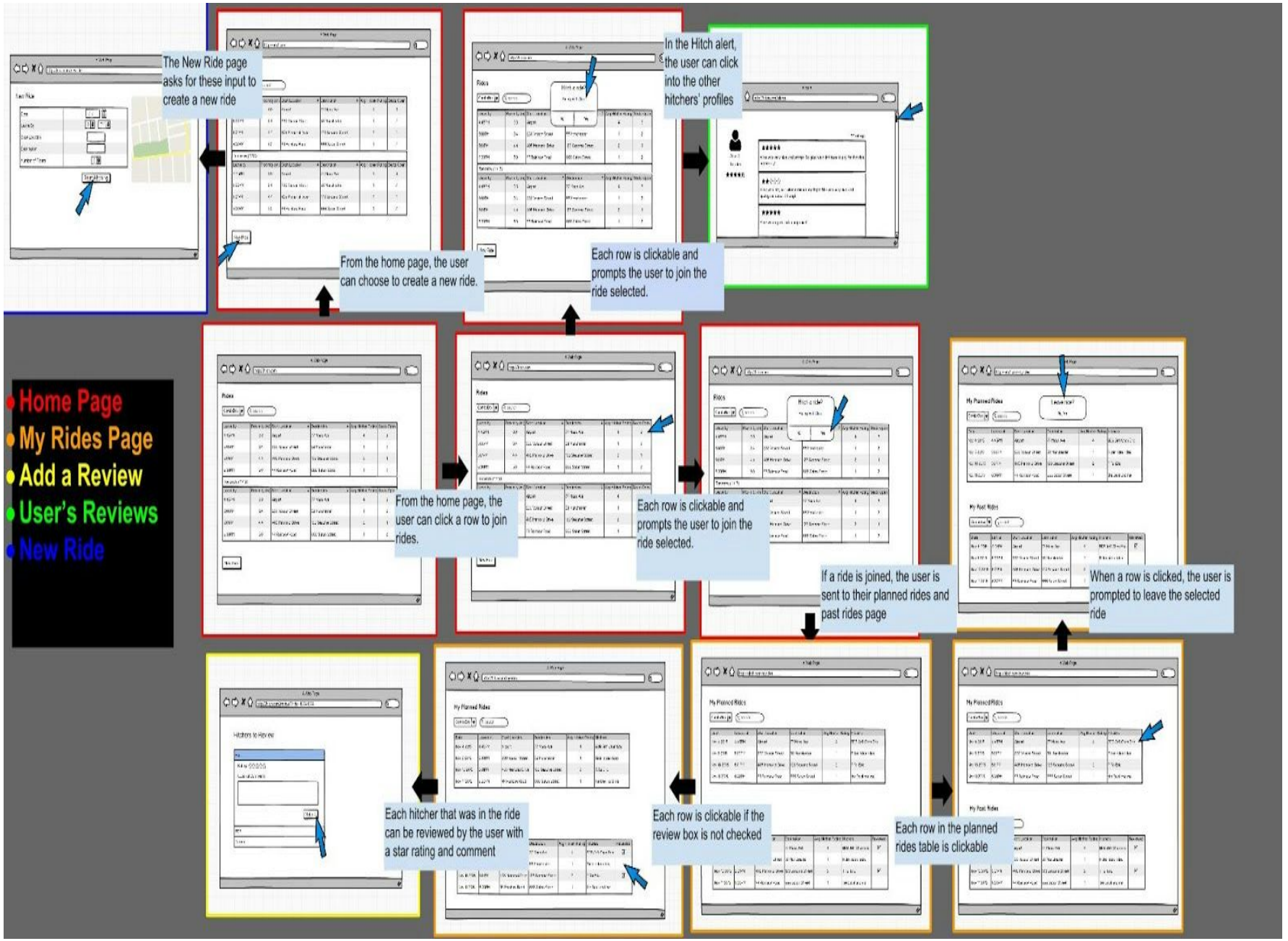


Review page for a user in a ride

Leaving a review for a user after carpooling

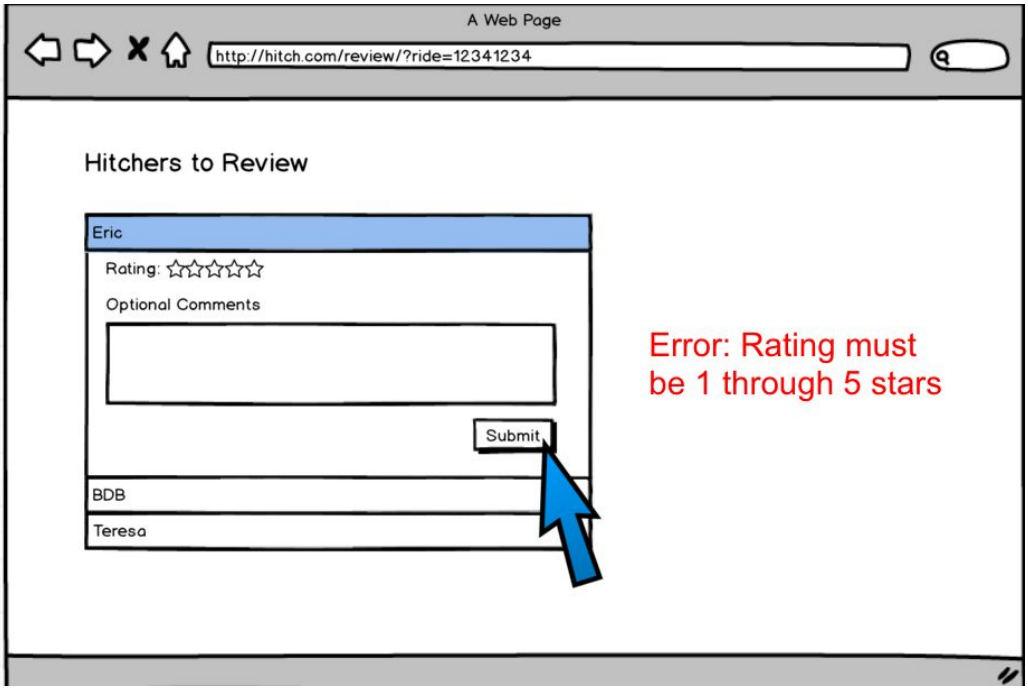


- Transition Diagram

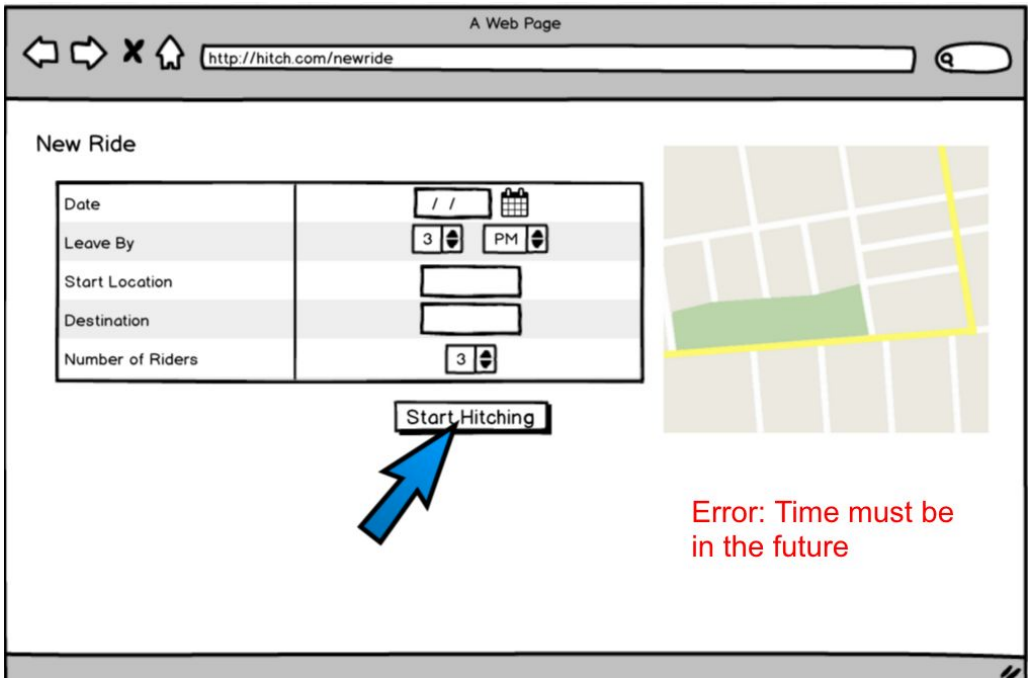

Home Page
My Rides Page
Add a Review
User's Reviews
New Ride
The New Ride page asks for these input to create a new ride
From the home page, the user can choose to create a new ride.
Each row is clickable and prompts the user to join the ride selected.
In the Hitch alert, the user can click into the other hitchers' profiles
From the home page, the user can click a row to join rides.
Each row is clickable and prompts the user to join the ride selected.
If a ride is joined, the user is sent to their planned rides and past rides page
When a row is clicked, the user is prompted to leave the selected ride
Each row in the planned rides table is clickable
Each row is clickable if the review box is not checked
Each hitcher that was in the ride can be reviewed by the user with a star rating and comment

- Error Handling

Error on review page



Error on creating ride page



Design Challenges

- Challenge: We should allow users to make use of the rating system to decide who is allowed onto a ride and who isn't. We could either have users who join a ride be approved by the creator.
    - Option 1: Users joining a ride have to be approved by a creator.
    - Option 2: The current participants in a ride can vote on a user who has just joined
    - Chosen Solution: We decided on option 2 because it seems more fair to allow all users to have a say. Note that this removed the need for a "creator," who is now just a regular user.
- Challenge: If a user wants to change the pickup or destination location or time, should they be able to, since it will affect all users?
    - Option 1: Allow a user to change the location or time of a ride, but require approval from all participants.
    - Option 2: Disallow users from changing the location or time of a ride once it has been created.
    - Chosen Solution: We decided that since users who join a ride are relying on the set locations and time, a ride's location and time should be immutable. A user who changes their mind would have to leave and join another ride or create a new ride.
- Challenge: There are many columns in the "available rides" table, making it hard to know which method of sorting would make it most user friendly.
    - Option 1: Users could sort rides by departure time.
    - Option 2: Users could sort by proximity of their desired start location to the start location of each ride listed.
    - Chosen Solution: We decided on option 1 because it would make rides easier for users to browse. The departure time would likely be the most important factor, because the users can set up a ride that takes this into account.