6.170 Final Project Design Documentation

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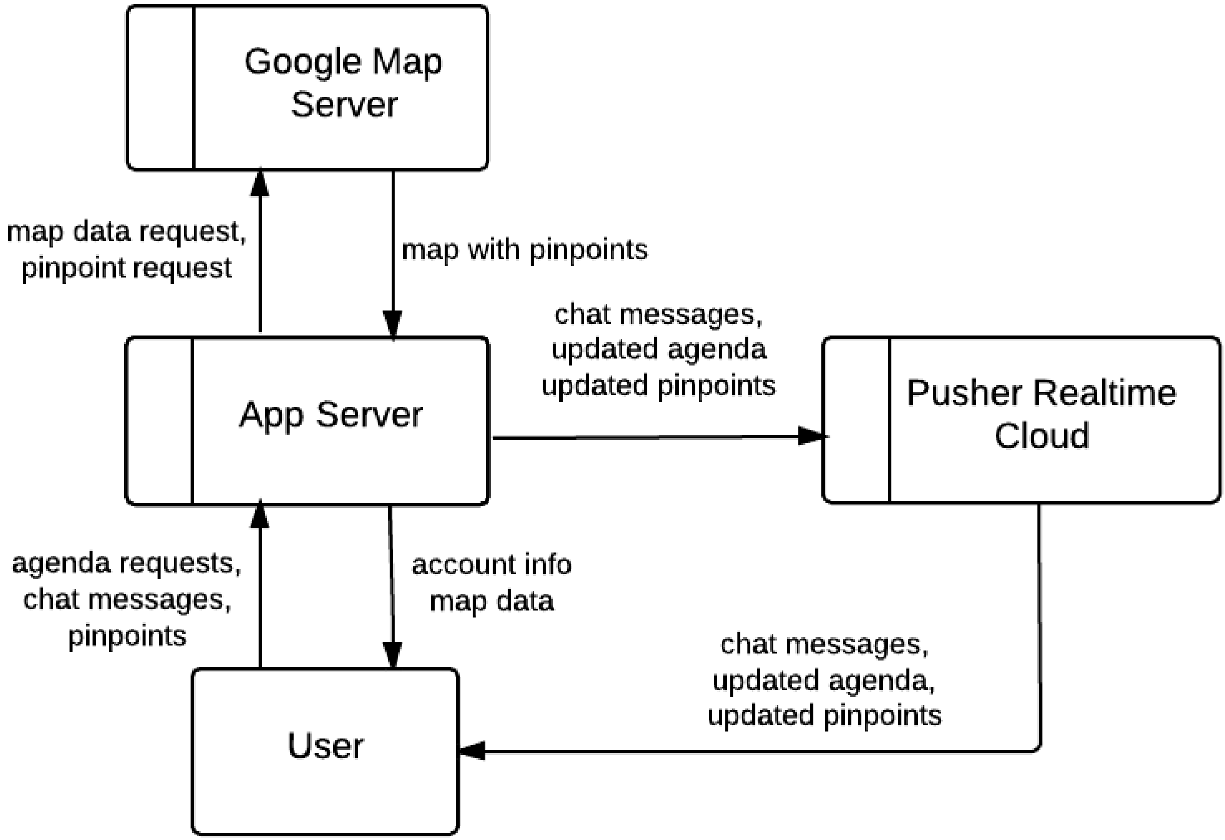
Part 1 Overview

1.1 Purposes and goals

DOWN2GO is an application for planning day itineraries with groups of people. Often times, when a group of people wants to make an itinerary for the day, they have to use multiple means of communication-via cell phone, internet messaging, etc. as well as seperate location services (ie. Google Maps, Apple Maps) to plan a day of events. Simply put, keeping track of all of these locations and when to be where creates an unnecessary inconvenience.

DOWN2GO solves this problem by integrating Google Maps location services with a real-time message chat and a live-updating agenda feature. It now becomes convenient to organize trips with friends, since DOWN2GO lets you discuss where to go, then shows you on a map with an itinerary of chosen places. Also, an agenda is automatically generated based on events entered as map pinpoints so people will not forget the schedule details. We hope that with this application, the question “Where are you DOWN2GO?” never ends in a missed opportunity of friends wanting to do hang out together but unable to come to a consensus.

1.2 Context Diagram


Google Map Server
map data request, pinpoint request
map with pinpoints
chat messages, updated agenda updated pinpoints
App Server
Pusher Realtime Cloud
agenda requests, chat messages, pinpoints
account info map data
chat messages, updated agenda, updated pinpoints
User

Part 2 Concepts

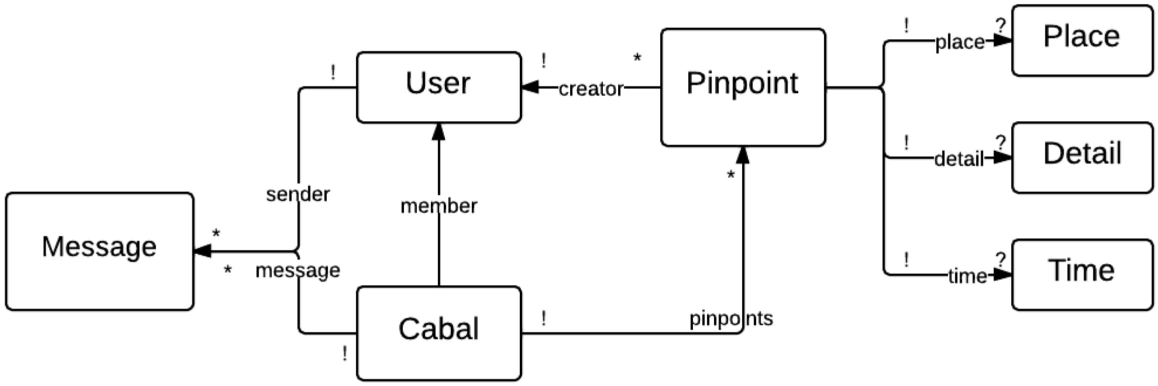
2.1 Key Concepts

Cabal: A group of users that join together to create an agenda for a specific period of time. A cabal is associated with one agenda, which means if the same group of users want to plan for two trips, there should be different cabals. A user can initialize the cabal by specifing the time period and inviting some other users. After that, all the users in the cabal can invite more users and they do not have the ability to kick out others.

Pinpoints: A user create a pinpoint by pinning on the map. After that, all the users in the cabal can specify what they want to do in this place, and when they want to be there.

Agenda: The agenda should be a sorted list of places, and each place contains the time to arrive there and what to do there. The system will give an evaluation on agenda by calculating the time cost between two places and checking if that fits the schedule.

2.2 Data Model



** In our design, one cabal has exactly one agenda, and an agenda has zero or more pinpoints. We do not have agenda in our data model because we will not store that in the database. Instead, we will create a self.agenda() method in the Cabal model, which returns a list of sorted pinpoints.*

Part 3 Behavior

3.1 Feature Description

- **Group planning.** Organize a group of your friends to work on a hangout plan.
- **Real time discussion.** Discuss with your friends about your thoughts on the plan using our real time chat.
- **Find your spot on the map.** Search for locations using google maps api and place your activities on the map with markers which include details about the activity and time.
- **Automatic agenda generator.** The system generates an agenda based on your marked activities for you to save and print for later reference.
- **Agenda Evaluation.** The system will give an evaluation on agenda by calculating the time cost between any two places and checking if that fits the schedule.
- **(Potential) Trip Suggestion** Give suggestions about how to plan the trip based on people's interest, location and time.

3.2 Security Concerns

The Security requirements are that:

- Only the invited members of an cabal can see and engage in a group’s activity including chat, map related actions and agenda management.
- Users have to be logged in to take any additional action.
- The user who created each chat message and each map pinpoint is shown to the rest of the users in the cabal.

Threat Model:

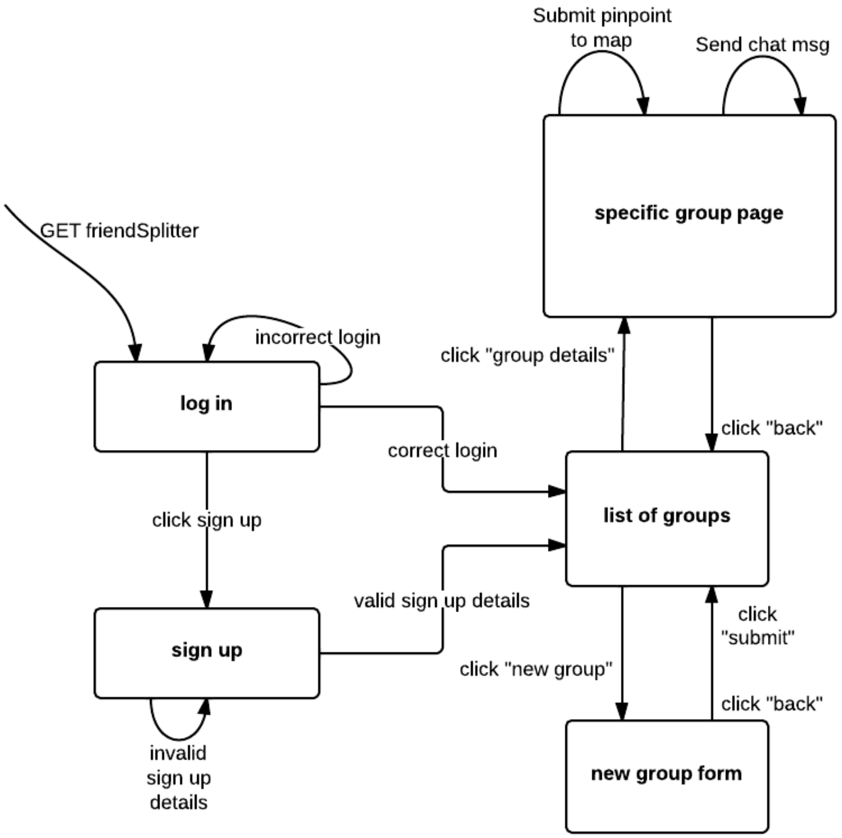
- Can assume no interest from state actors or criminal syndicates, since only minimal profile information stored (name and email).
- Since a cabalis assumed to be consisting of people who already plan to hang out with each other and assumably familiar with each other, fraud is unlikely.

Potential Risks and Mitigations:

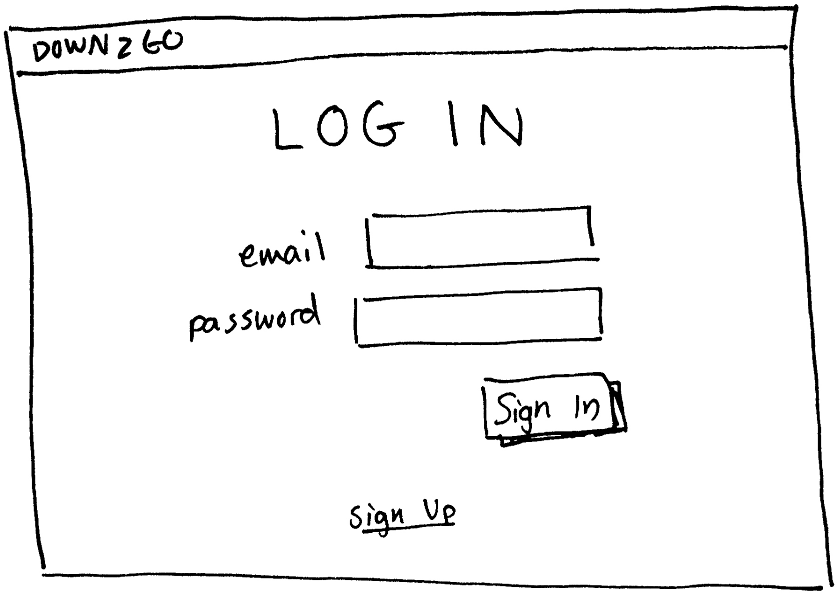
- Malicious users may attempt to access other people’s agendas for private data.
  - We will limit to access to each group’s activities and data to users who are participants in the group.
- Participants in a cabal can edit markers and the agenda freely such that someone in the group may disrupt the normal activity of the whole group.
  - At the moment, we do not plan to limit the freedom of activity of each user as long as they have been invited to the certain cabal. Beyond the MVP, we might implement some features to ask for the other users’ consent before making any changes to the cabal agenda.
  - For the trip-planning cabals, assume that all members know each other well, and communicate out-of- band, so little risk of fraud.
- Chat messages are sent without being encrypted at the moment.
  - We will send the message over HTTPS.
- Rails’s built-in security features will protect the server against CSRF, database injection and javascript injection.

3.3 User Interface

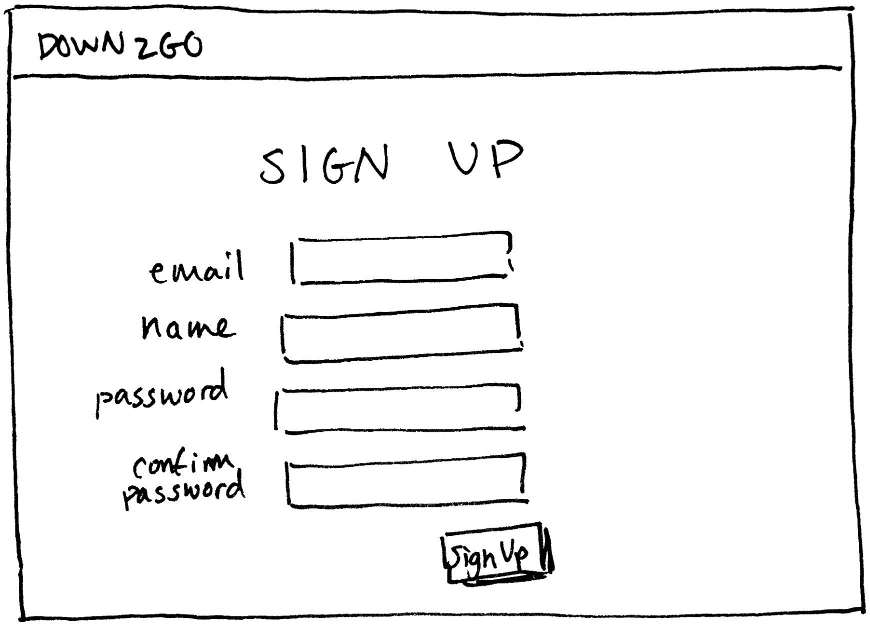
Page Flow



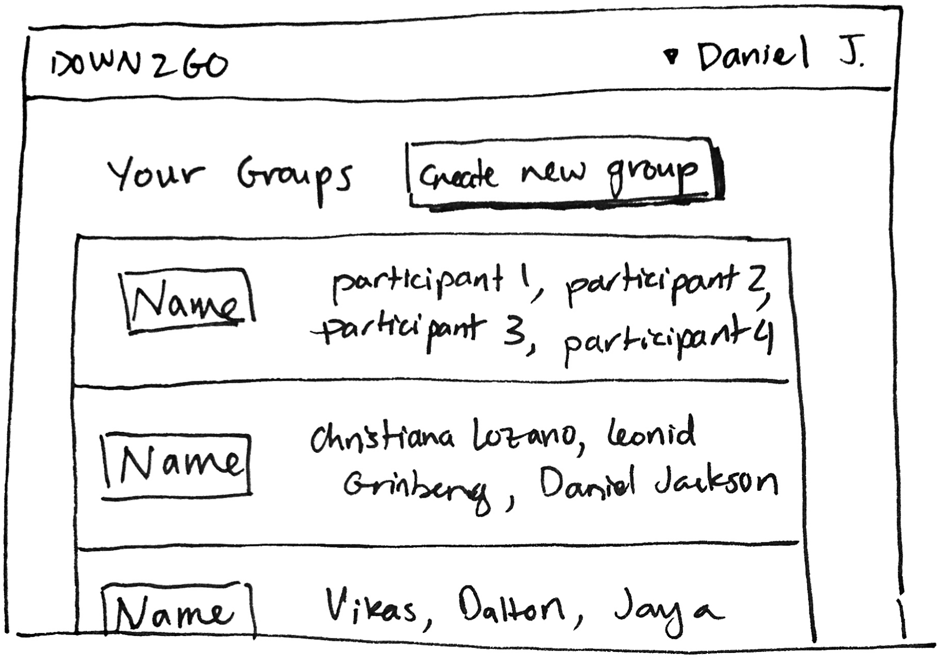
Login Page



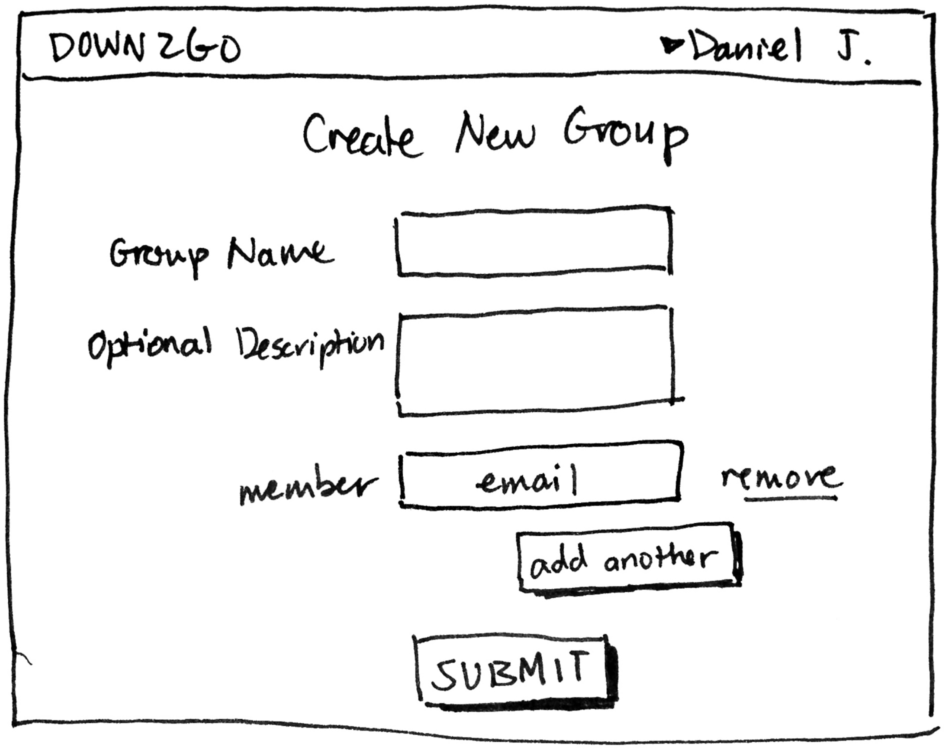
Sign Up Page



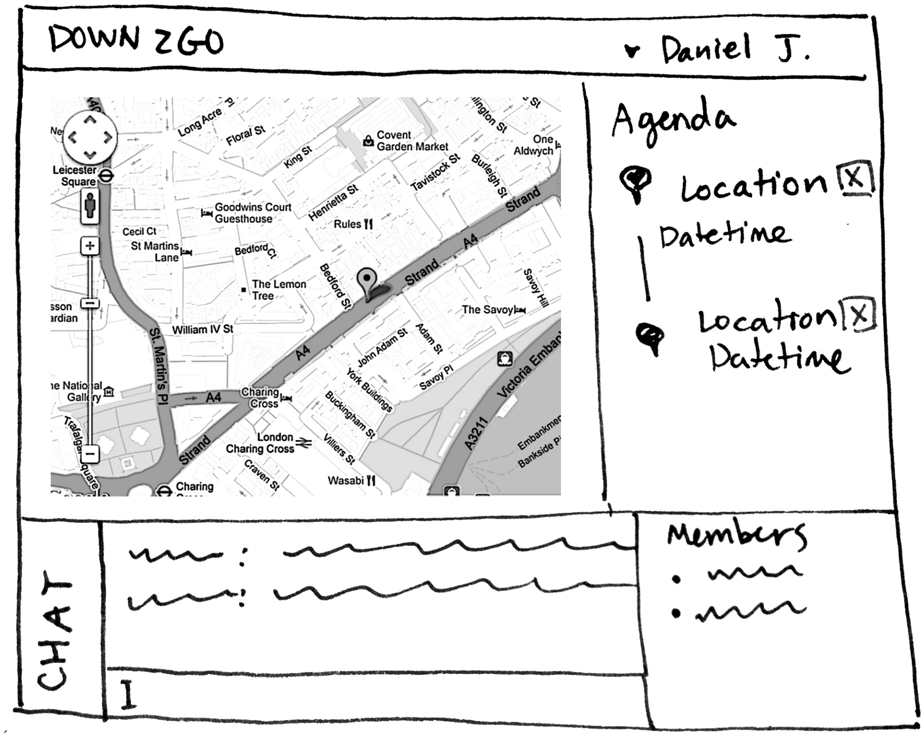
List of Groups Page


DOWN2GO
Daniel J.
Your Groups
Create new group
Name
participant 1, participant 2, participant 3, participant 4
Name
Christiana Lozano, Leonid Grinberg, Daniel Jackson
Name
Vikas, Dalton, Jaya

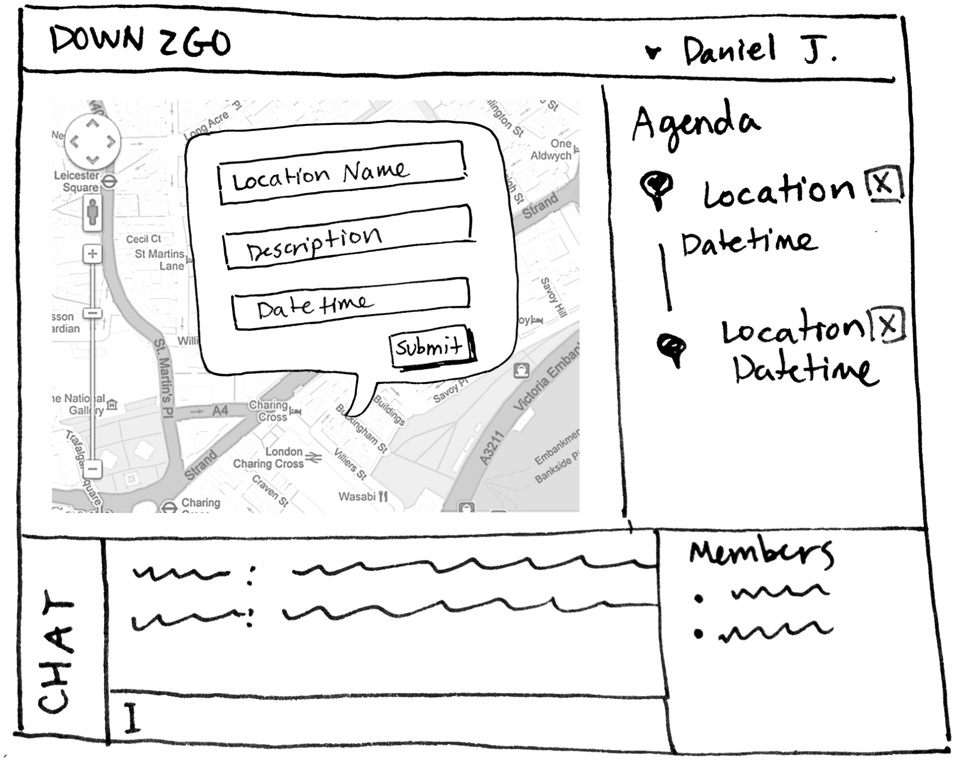
Create New Group Page



Page for a specific group



Page for a specific group after clicking a point on the map



Part 4 Design Challenges

4.1 Behavioral Challeges

Whether to bring people to a decision?

Currently we have a lot of features to facilitate planning for a trip, such as auto-generated agenda, map integration, and agenda evaluation. But we do not support a feature to bring the group of people to a final decision. Because we are solving the problem that people always plan their free time very inefficiently, it seems reasonable that the app have some strategies to force the users to make an agreement.

However, trip planning does not involve money or privacy. Sometimes people do not take it seriously. So if the app forces them to make an agreement, they will feel constrained. We want to give users more flexibility. If they are really into the trip, they will reach an agreement themselves; if they do not care about whether a trip is planned, they can end the conversation any time.

Moderator in the cabal?

It is common to have a moderator in a cabal. He can decide who can join the cabal and kick out people with bad performance.

However, we will not support a moderator, which means all the users in the cabal can invite more users and they do not have the ability to kick out others. This gives users more flexibility and makes the app easier to use. Trip planning usually does not involve money or privacy, so the potential risk of privacy leak is low. Also we assume that people already form a group before using our app, so it will be very unlikely they invite a bad user to the cabal. If accidentally, a bad user come into the cabal, people can quit the cabal and create a new one.

As an example, facebook group chat also do not have a moderator, and people cannot kick out people. Our app and Facebook chat are both social chatting systems, so it is reasonable for us to choose a similar strategy.

Editing pinpoints--should we allow drag-and-drop?

Since the map pinpoints is a spacial feature it would feel natural to implement a drag-and-drop action for the pinpoints such that users can move the points after creating them. There are certain advantages to this; for example, adjusting the meeting location to some convenient points, fixing mislocated points, etc. However, we do not expect to implement this feature in the minimum viable product because its benefits are not critical to our solution, and the overhead it causes due to potential race conditions is not a problem we have to face.