6.170 Project Design

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Website name: Trippy

1. Overview(Purpose and goals)

1.1 Brief Description

An app that lets users share their availability, places of interests and budget range, create and organize trip groups with friends.

1.2 Key goals and purpose

- Facilitate the formation of trip groups through easy sharing of information;
- Facilitate the communication inside a trip group to plan the activities and logistics of a trip.

1.3 Motivation for development

Friends use email, text, Facebook messages, phone, and in-person communication to plan and organize trips. This gets very hard as number of the group members increase, with many moving parts such as dates, destinations, budgets, activities, and so on. The existing solution includes following:

- Doodle / WhenIsGood
  These websites allow users to create a poll of availability for an event. Then users are polled to determine the best time and date to meet. Also, the websites show common free times among all users. They make the scheduling of events easy. However, they have no specific relation to travel.
- Triporama
  Triporama let allows you to plan a trip and to invite friends and family members to join. Users can also create trip plan and then invites others to join the trip group. However, the users need to create a plan first without any knowledge of other's availability, interests or budgets. In addition, the site looks over-complicated to use.
- TripIt Travel Organizer
  TripIt automatically creates a detailed itinerary after user forwards travel confirmation email to the app. It helps one individual organizes his/her trip. However, it does not help to coordinate group travel.

Our solution is different from above solutions in that we aim to provide a easy way for friends to share trip-related details such as when they are free, their interests and rough budget range. As a result, before creating a trip group, a user has a general idea of his/her friends' availability and interests. Also, we aim to improve simplicity in group discussion of the logistics of the trip and which activities to do for a trip. So there is higher probability that the trip becomes reality.

2. Context diagram

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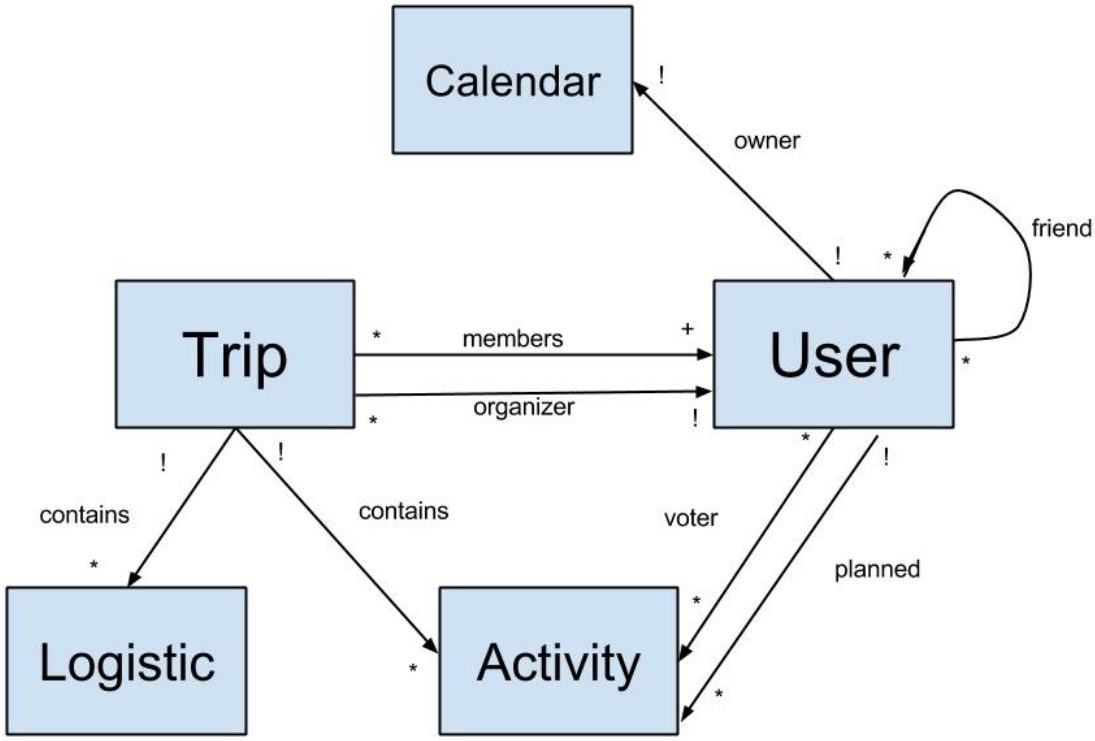
3. Key Concepts

Trip: A journey that a group of people wish to go on together. Each trip has a destination, date range and participants. A trip is created by an organizer who can invite his/her friends.
User: An individual user who desires to plan a trip with friends and use the app.
Activity: A proposed activity for the group to do on the trip.
Vote: A user votes on activities for the group to go on.

4. Data model



5. Feature descriptions

- **User authentication**: Users could create an account and log in/out through Facebook.
- **Friendship management**: Users could add friends through Facebook.
- **Profile sharing**: Friends could see each other's profile, including free dates, destinations interested in going and acceptable budget range.
- **Trip creation**: Users can create a trip and invite friends to join.
- **Activity planner**: Users suggest activities to do on a trip and vote for their desired activities.
- **Activity gallery**: Users can upload pictures and descriptions of various activities to convince their friends to vote for it on the trip.

- **Logistics organizer**: Users can sort out final logistics of the trip including hotel information, flight bookings, final dates, etc.

6. Design challenges

1. Friendship management: how could users add and confirm friends with each other?
   Option 1: Users manually add other users in the site as friends by typing in the email address of friends.
   Cons: Users' friends might not have registered in the site. However, as we would need to have friendship model, this makes seeing other friend's profile information easier.
   Option 2: through Facebook: We could use Facebook API for not only user sign up, but also friend invitations. If a user sign up through an invitation, her/she automatically become the friend of the inviter. And the inviter is also his/her friend on Trippy.
   Pros: users could easily invite a large number of friends without performing any additional friend adding action.
   Cons: Some Trippy users might not have Facebook accounts.
   We choose option 2 because the user does not manually add friends and makes our app more usable.

2. Can the creator of a trip invite user who is not his/her friends to join the trip? Can member of a trip invite their friends?
   Option 1: Only allow the creator of the trip to invite his/her friends into the trip.
   Pros: This keeps the size of trip relatively small and there is a stronger sense of trust among the members of the trip.
   Cons: A friend of the creator of the trip might also want to invite his/her friends to join in the trip. If so, then the creator needs to add his/her friend's friend as friend.
   Option 2: Allow all members of the trip to invite their friends.
   Cons: In real life, there are situations where friends of the creator of the trip want to let their friends who are not friends of trip to join a group.
   Pros: Since the members of the trip might not be direct friends with each other, there is less trust and unity among the members.
   We choose second option. The first option, while insures that everyone in the trip are friends with each other, restrict the range of people in the trip.

3. Should a trip has an associated state such as active/finalized. And how should a trip becomes finalized.
   Option 1: A trip becomes finalized when its date has been past.
   Pros: Users don't need to take care of closing a trip.
   Cons: The app needs to periodically check if the trip date has been past and this places additional requirement on the app. In addition, malicious users could change the date and therefore close the trip.
   Option 2: The trip creator could close a trip after he sees that the majority of trip member has agreed on relevant trip details. Only the creator can close a trip.
   Pros: This correspond to real life situation.

Cons: Members other than the creator of the trip might believe that the details of a trip aren't finalized yet.

We chose the second option because we don't want the system to check it the trip dates have passed automatically. Beside, a trip should be considered closed if all details are settled. And we want the organizer to have more power than the rest of the group members.

7. Security concerns

7.1 key requirement:

- Only current members and creator of a cabal could view cabal information and vote on activities
- Only authenticated users could see their private data.

7.2 Threat model

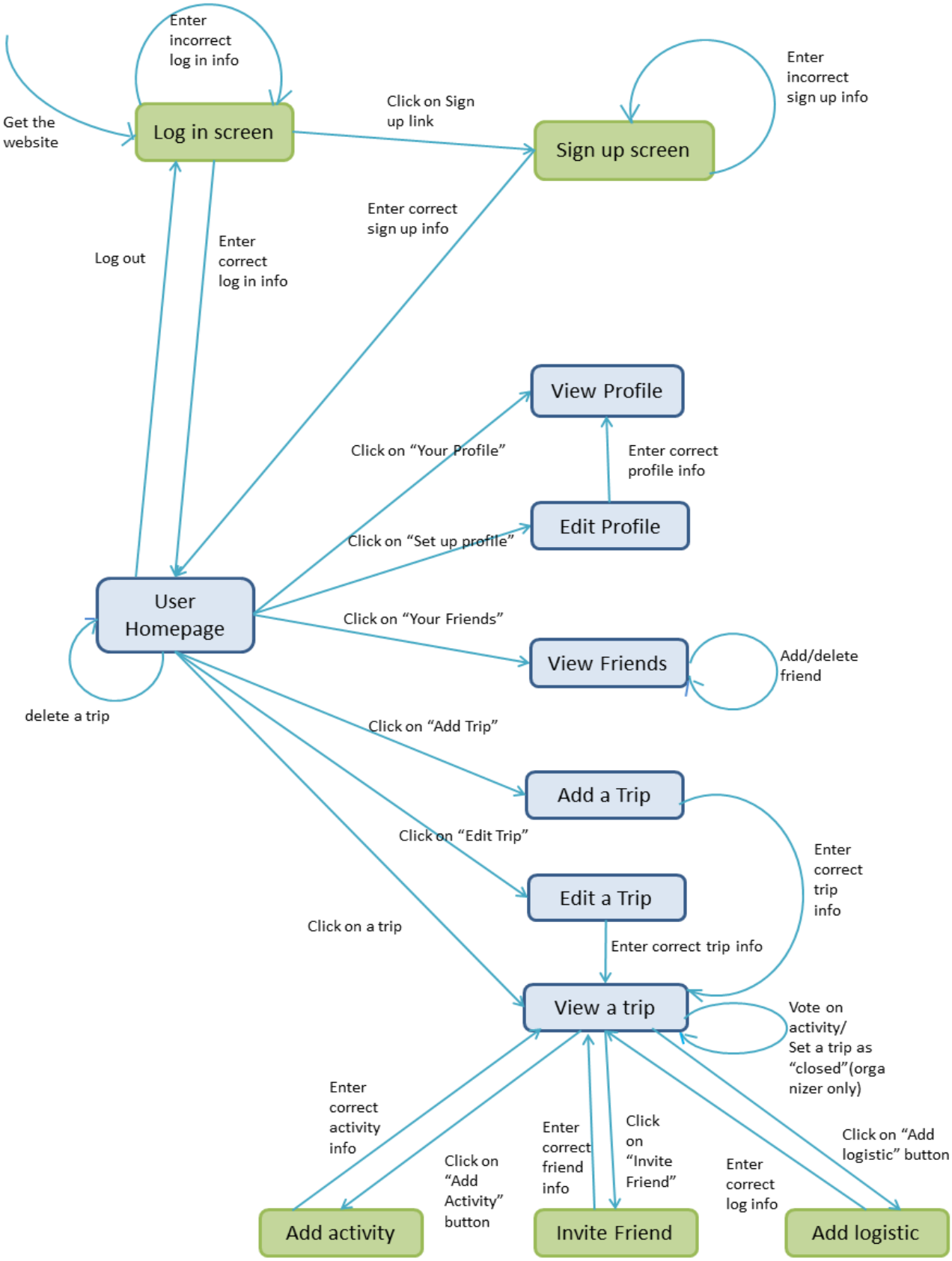
- Unauthenticated users or users who don't belong to a trip may try to view or edit a trip.
- Authenticated users enter information via forms, which can allow for vulnerabilities such as SQL injections.
- Malicious member hacks into another user's account or viewing their private data (their email, invitations and trips) without authorization.
- Malicious users could also create lots of trip and spamly add friends as participants.

7.3 Mitigation of Attacks

- **Access control:**
  There is sitewide protection that prevents users from accessing any part of the website without being logged in, except for the login and signup pages.
  In addition, every page checks that the currently logged-in user is allowed to view the current page.
- SQL injection:
  Only Rails ActiveRecord methods are used to access the database. Since ActiveRecord methods sanitize the database queries automatically, there should be no risk of SQL injections.
- XSS:
  Rails escapes HTML strings by default. Trippy should not be vulnerable to basic XSS attacks by not using any raw HTML strings.
- CSRF:
  Since the line "protect_from_forgery with: :exception" is included in the Application Controller, Rails automatically protects the website from CSRF attacks.

8. User interface

8.1 Wire Frame for the application



Note: All blue boxes are reachable from other blue boxes through the navigation bar(the user homepage).

8.2 Wire Frame for major pages

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