Overview (Rena)

Our project is mapMIT, an interactive map of MIT for displaying on-campus events, organized by location, so that groups can publicize events and students can see what's going on around campus. The web application that we plan to build consists of three main elements: events, groups, and a map. Users can create events and filter them by time or location. Our application will also have groups that users can create in order to make certain events visible to a subset of the user base. Finally, the interactive campus map will bring these elements together by displaying events as pins around campus, allowing users to see what events are planned or currently happening.

One motivation behind mapMIT is due to the fact that current methods of dealing with the large volume of campus events are outdated and inefficient (i.e. pamphlets, newsletters). We aim to provide an organized solution to this problem by acting as a hub where information about all on-campus events can be aggregated and displayed. For multi-day events like CPW and orientation, there is a need to help students figure out what events are going on and where they are. Additionally, our app would be an improvement to publicizing events through mailing lists, which is the method students groups use now to publicize online. Our application would be a single website where students can look for information about all events going on.

Next, we want a way for users to create events that are private or public. A user can create a group and add other users to that group. When an event is created, the creator can choose whether the event can be viewed by all users or only the members of one or more specific groups. This ability to create public or group-specific events is an effective way to consolidate the act of sharing or advertising events; currently this is done sub-optimally by spamming mailing lists and putting up posters.

The final purpose is to organize events geographically. CPW and orientation have many, many events over the course of multiple days where most participants are new to campus. Right now, the solutions for listing events are the CPW/orientation booklets and the CPW mobile app. While these methods all help students know what is going on, none of them display the information in a map format, so students that are not familiar with the MIT campus cannot easily associate a physical location with an event.

Design Essence (Elysa)

Concepts

- Name: Event
  - Purpose: To allow users to create and view events happening at MIT.
  - Operational Principle: Users create events so that other users can view the events that are happening on campus. Users can edit and/or delete events that they have created.
  - Anticipated misfits: Event details might change after creation; for example, the speaker, location, or time might change
- Name: Group
  - Purpose: To allow users to make events specific to certain people.
  - Operational Principle: A user can create a group and add other users to that group. Once you are part of a group, you can view events specific to that group. Users can remove themselves from groups they are in.
  - Anticipated misfits: Users might try to join groups that they shouldn't be in; users might get added into groups that they don't want to be in
- Name: Location
  - Purpose: To allow users to find where events are happening on campus.
  - Operational Principle: When a user creates an event, they must specify the location of the event. Since each event has a specific location, users can view events based on geographic location.
  - Anticipated misfits: None

Data Model
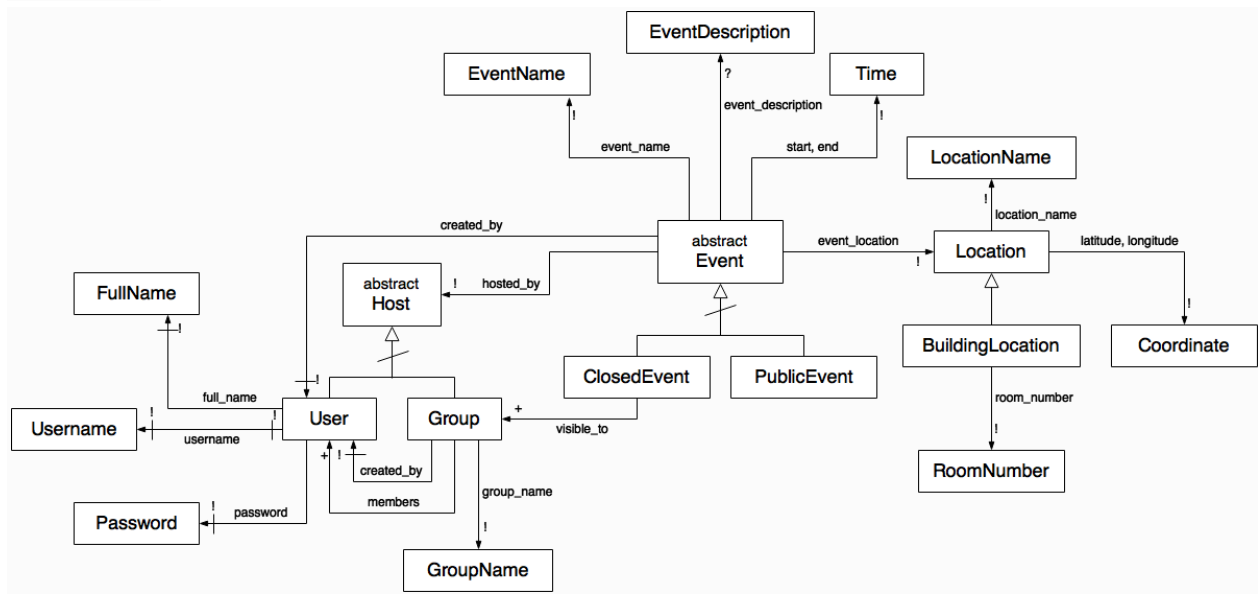
- Explanations
  - Host is the user or group "hosting" the event. For example, Dora may create an event for CSC, but the host is the group CSC, not Dora herself.
  - A ClosedEvent is an event that is visible only to the members of one or more specified groups. For example, a CSC event may be visible only to members of the CSC group, or it may be public to all of MIT.
- Textual Constraints
  - The user who creates a group is also a member of the group
  - If an event is hosted by a Group, the user who creates the event must be in that Group

Security Concerns (Casey)

As a basic security policy, we will only allow users that are logged in to access any page in the system. Thus, users can only create events and view events if they are logged in to their account. Also, users can only add people to groups if they are the creator of the group.

- Threat Model
    - We are assuming that users will not have access to the server.
    - We are assuming that attackers are anyone on the Web who can issue malicious requests to the app's endpoints
    - We are considering options to authenticate users; ie by kerberos/MIT Certificates, or by MIT ID

Standard Web Attacks	How To Mitigate
CSRF attacks	Use hidden tokens so that a malicious site cannot use a user's cookies to access and mutate another user's account. This token would be generated every time the page is generated, and is associated with the specific session. Middleware can check that the CSRF token matches the request and session.
XSS attacks	Manually escape text content that is presented to users so that javascript cannot be injected and malicious scripts cannot be executed on the client side. Use secure and HTTPOnly sessions. Sanitize user inputs by casting the inputs as strings, for example by using JSON.stringify.
Code Injection	Sanitize user inputs by casting the inputs as strings, for example by using JSON.stringify.

Wireframes (Dora)

Sign Up page:

mapMIT

http://

Welcome to mapMIT!

Sign Up

Username: [   ]

Password: [   ]

Already have an account? Login here.

[Sign Up!]

Login page:

mapMIT

http://

Welcome to mapMIT!

Login

Username: [   ]

Password: [   ]

Don't have an account? Sign up here.

[Login]

Home (Map) page:
- Users can filter for events of different types, times, and locations
- Hovering over a pin on the map will show details of the corresponding event(s)
- All the events on the map will also be listed under the map

mapMIT

http://

Welcome to mapMIT!

Logged in as: Bob   [Logout]

Home | My Events | My Groups

Filter

Event Type
- ☐ Public
- ☐ Group-specific
  - ☐ SWE
  - ☐ CSC

Time
- ○ Happening Now
- ○ Happening at:
  - Date: [/ /] 📅
  - Time: [▼]

Location
- [▼]

[Apply]

Event Name: Waffle Night
Description: Come eat waffles!
11/12, 9pm-11pm, W20

Event Name	Host	Description	Date	Time	Location
Waffle Night	SaveTFP	Come eat waffles!	11/12	9pm-11pm	W20
Medlinks Study Break	Medlinks	Free fruit	11/15	9:30pm-10:30pm	Maseeh Lobby
CSC Bigs and Littles	CSC	Get your bigs/littles!	11/16	9pm-10pm	Baker Dining

Create Event page:
- The default host will be the user, which can be changed

Edit Event page:
- The input fields on this page will be pre-populated with the events current details
- The user can cancel editing, which will not affect the event, or save the edits, which will update the event details

mapMIT

http://

Welcome to mapMIT!

Logged in as: Bob   [Logout]

Home | My Events | My Groups

Edit Your Event

Event Name* | Medlinks Study Break |

Date* | 11/12/2016 | 🗓

Time* | 9:30pm | - | 10:30pm |

Event Description
| Free fruit |

Select Location* | Maseeh   ▼ |

Location Description
| Maseeh Lobby |

Host* | Medlinks |

Privacy   ⊙ Public
                   ○ Group-specific
                      ☐ SaveTFP
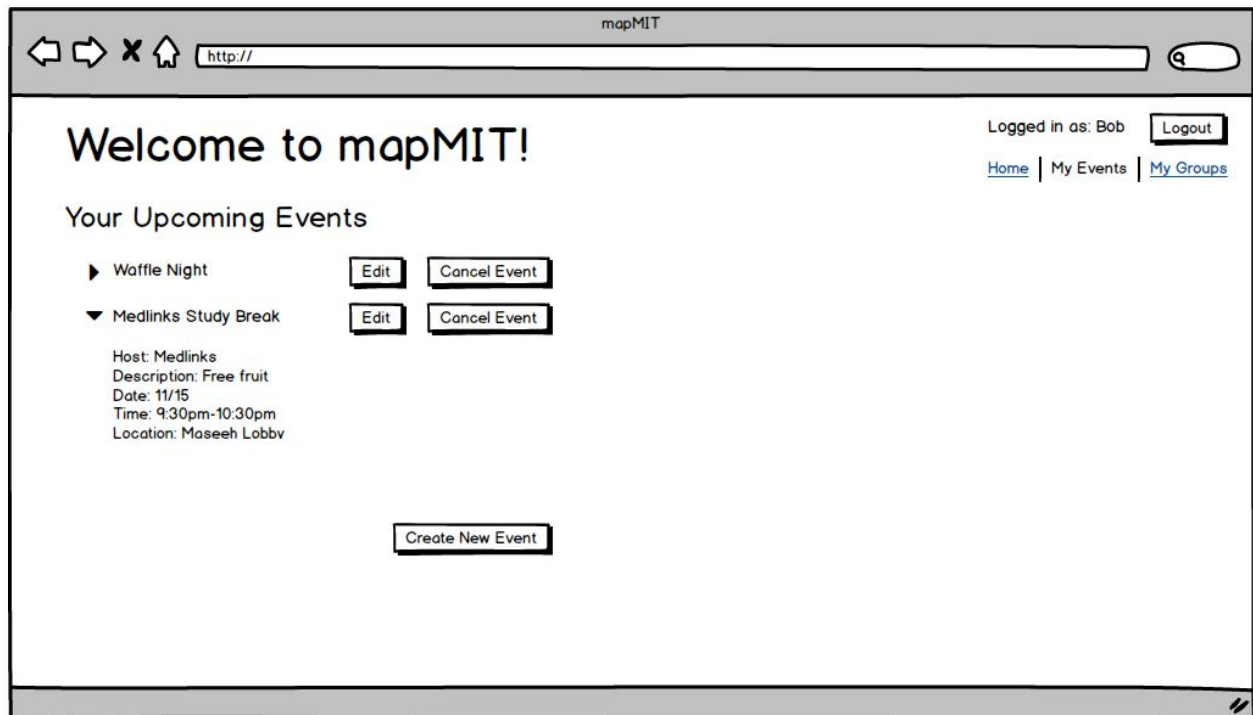   ☐ MedLinks

                                [Cancel] [Save]

My Events page:
- Users can view the events that they have created and also edit or cancel an event
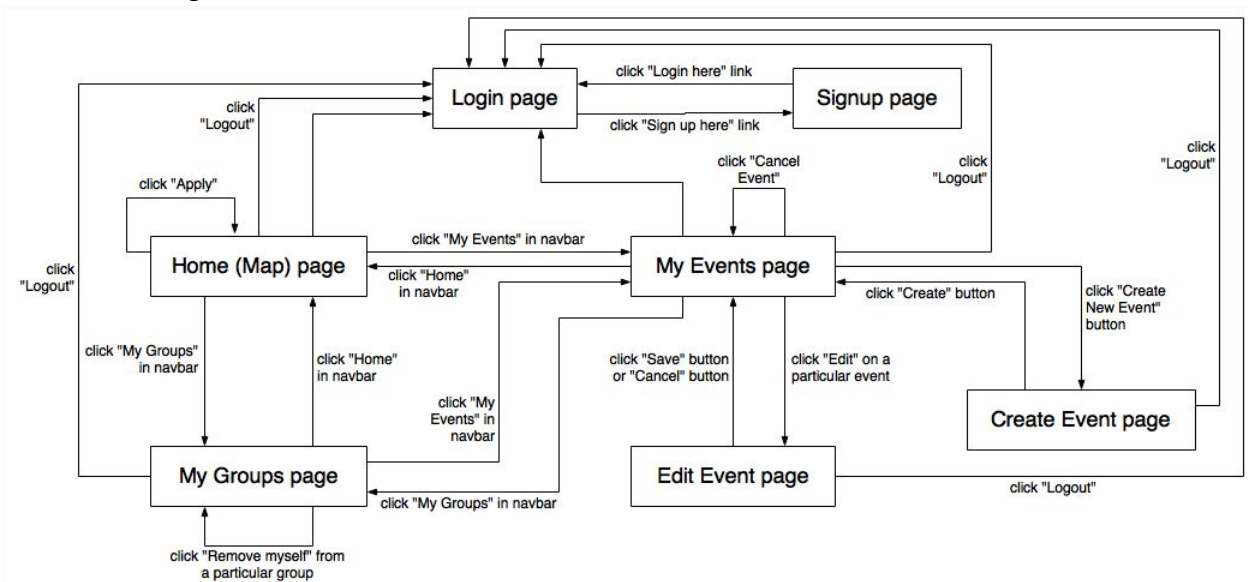- Users can create an event from this page

My Groups page:
- Users can view the groups they own
  - They can view all members of the group
  - They can add members
- Users can view groups they are a part of, and remove themselves if they wish
- Users can create a group from this page
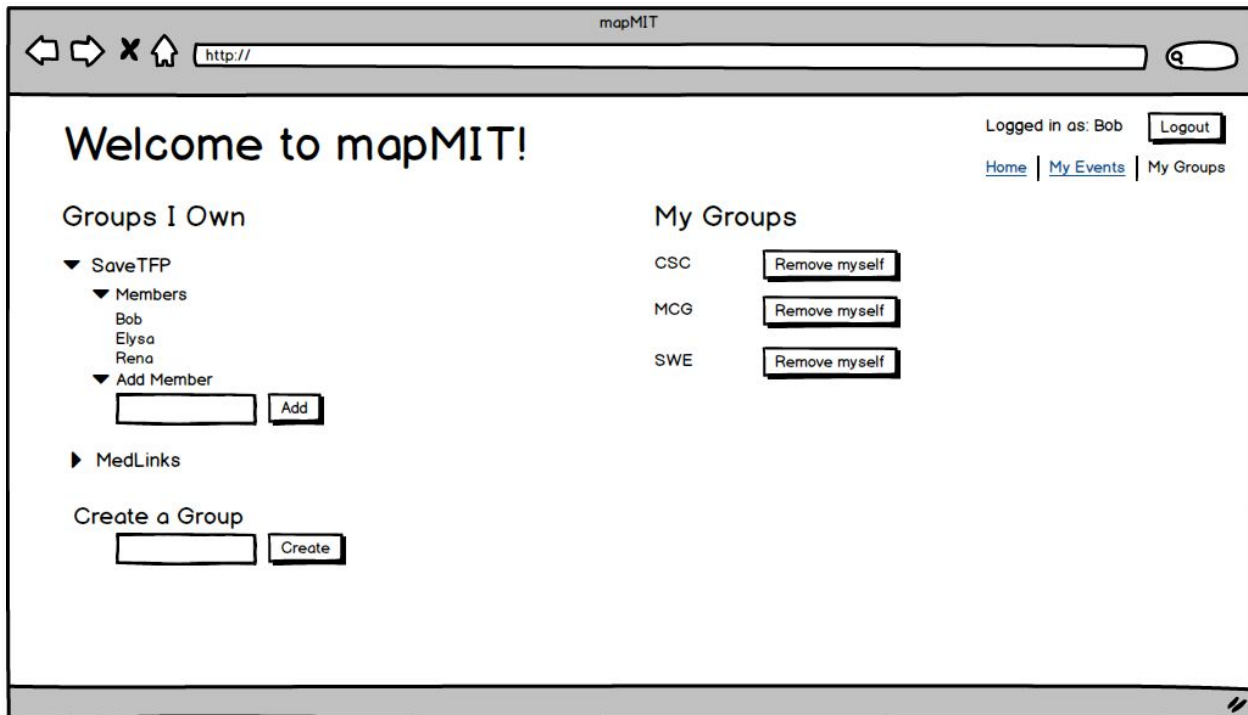
Transition Diagram:

- Not depicted: Clicking navbar links to Home, My Groups, and My Events from the Edit Event and Create Event pages

Challenges
Design risks

Risks	Solutions
Users might try to join groups that they shouldn't be in	Group owner must be the one to add members to the group
Users might get added into groups that they don't want to be in	Users have the option to remove themselves to groups they have been added to
Event details might change after creation; for example, the speaker, location, or time might change	Users can edit the events that they have created, and edited events are visibly flagged on the page to notify users of the change
Non-MIT people might try to view MIT events, which could have potentially creepy or threatening consequences	Users must be authenticated in order to access the web application
Users might try to create inappropriate events	If a user sees an event on the page that is inappropriate, offensive, or dangerous, then he or she can "report" the event

Design choices
1. The concept of a group.

We knew that there was a need for making certain events available to only a specific subset of the user population, so we weighed the idea of having a concept of Privacy versus a concept of Group. In the end we decided to have a concept of a Group, because it was a clearer solution to the intended purpose. Privacy would have to be associated with each event that was ever created, whereas Groups could be created once and then reused for future group-specific events. In this way, Groups proved to be the more efficient solution, providing users with a streamlined process of event creation, and allowing users to have a greater degree of control over what groups they are part of and what groups they own.

2. Location.

Because we planned to display the pins for events on a map, we needed a concept to encompass the geographic location of events. At first we wanted to call our concept a "Map", but we eventually decided against it because we did not want to confuse the concept with a user interface element. So, we decided to have a concept of Location. When creating our data model, we discussed how we wanted to represent the location information -- first we considered x- and y- coordinates, but this idea seemed unreliable for the data model because x- and y- coordinates are relative, not absolute. After some discussion, we chose to encapsulate the geographic location with longitude and latitude, which are globally absolute and can be mapped to relative coordinates if needed.

3. PublicEvent and ClosedEvent.

After deciding on the concept of a Group, we needed to change our data model in order to reflect the fact that some events would be available to the public and some would be restricted to specific groups. So, in our data model, we decided to make PublicEvent and ClosedEvent disjoint subsets of Event.

4. Contents of home page

Our home page greets logged-in users with a view of the map with the event pins, and a filtering interface so that they can filter the events by event type, location, or time. This was a sensible design decision in and of itself, but we also had to choose how we wanted the homepage to behave if the user did not select any filter criterion. Ultimately we decided to display all events that are Happening Now.

Goalls for MVP
- Users should be able to create, edit, and delete public events
- Public events should be properly displayed on interactive map
- Hover action on map pins should display event details
- Attempted implementation of filters (either work in progress or finished)