Team: Starfleet

Designs for SnapBack: An Application for the Lending and Returning of items

NOTE: All changes italicized and underlined (05/05/13)

Overview

Purpose and Goals

SnapBack is an application designed to facilitate lending and borrowing items within MIT community. Many times we see emails asking if anybody has a specific item and if the sender can borrow it. Since there is no other way to ask a great number of people without sending emails, we decided to build SnapBack to transform the way people borrow things.

SnapBack allows for a more systematic borrowing and lendings. For example, college students are often short on cash, so we are constantly borrowing and lending money to our friends. However, keeping track of money we owe to other people and money they owe to us can be an ordeal. People generally do not keep reminding their friends about debts because bring up the topic of owing money can be a touchy subject, which causes both parties to forget. A good way to fix this is to introduce some third party system that periodically reminds the other person to pay you back.

Additionally, since college students don't have the luxury of buying every single item that they could potentially need (aka, most people wouldn't buy things like wood glue just to fix one wooden item that was broken), people often need to borrow these items from other students.

SnapBack is an application that will allow MIT students to easily return items, while implementing some reminder system that will encourage users to return items in a timely manner. It can remedy mentioned problems by allowing people to ask their friends, or members of our site, to borrow items.

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Context Diagram

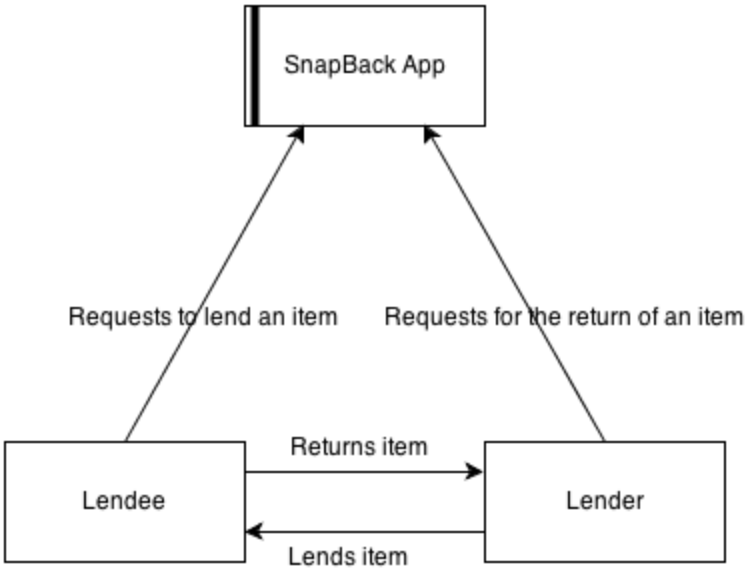

Figure 1: Context Diagram

Concepts

Key Concepts

The key concepts behind SnapBack are **lends**, **returns**, and **end-to-end validation**. Users of this system will be able to request **lends**, which are items (cash, books, clothing, etc.) that they borrow and will be able to return (if needed). Users will also be able to request **returns** from other users that they have lent items to. Because each request can be initiated independently, we will use **end-to-end-validation** to ensure that the requests are correct and unspammable. Each user will verify the request in this validation process

Object Model

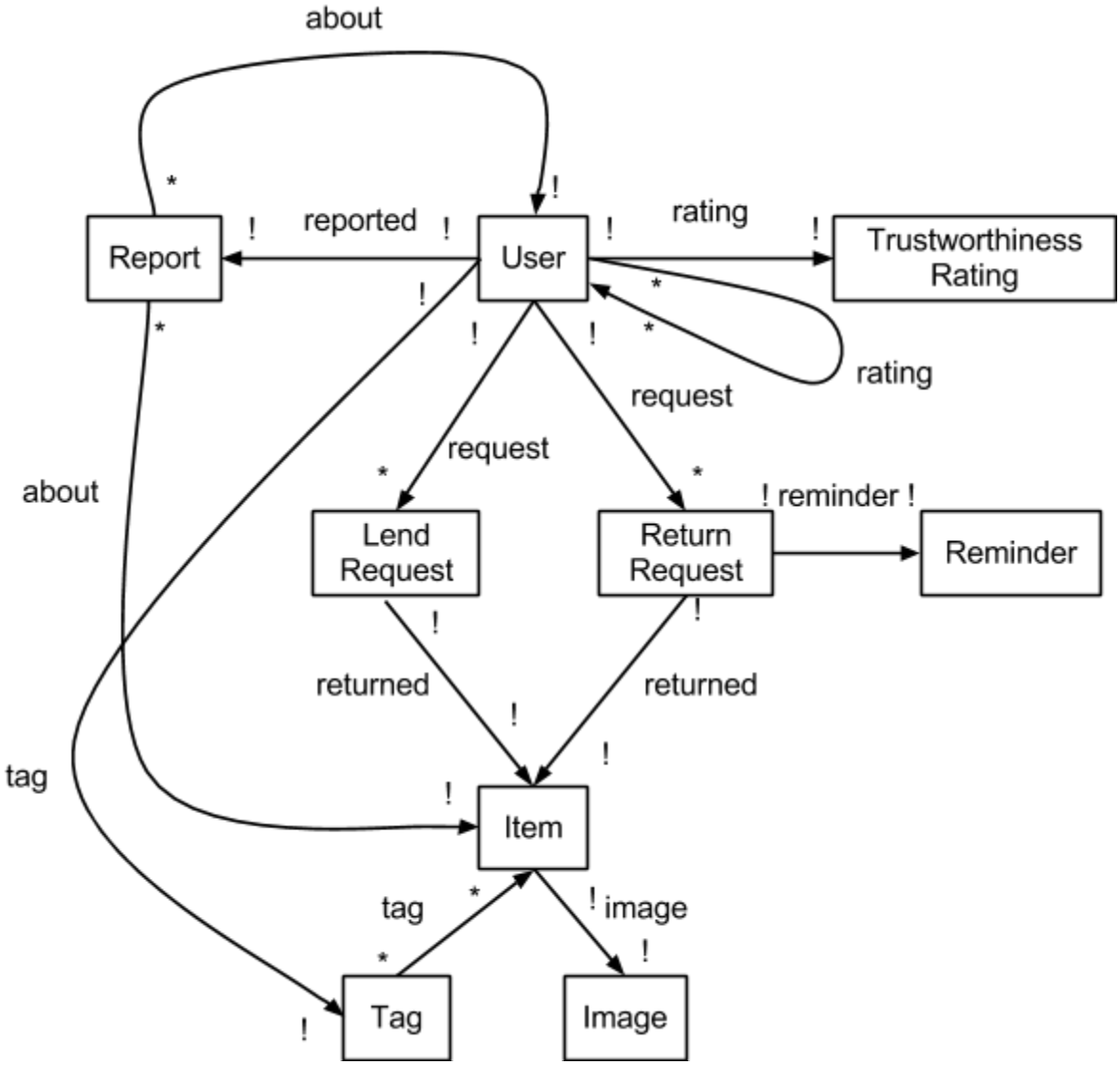

Figure 2: Object Model

Behavior

Feature descriptions

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SnapBack provides following functionalities:

1. Lend request: a user can post a lend request for any object with tag and image.
2. Return request: a user who agrees to lend the object can specify the return date. Snapback will send a reminder email to the borrower before the return date.
3. Report: a user can report requests related to illegal objects, etc.
4. Trustworthiness ratings: a user can rate other user's trustworthiness based on their lending /borrowing experience
5. Tagging: a user can tag their lend requests for easy filtering and searching
6. Searching: a user can search for specific requests
7. Image: a user can post an image along with their item requests

Security concerns

SnapBack has the following security requirement: it makes sure that a user registers with a valid MIT email and needs to login to make requests. The application may be vulnerable to the following potential security threats:

MIT Only
We want our application to only be available to MIT students and community members (those with mit.edu addresses), since we want students to feel safe interacting with others on the site. To do this, we will require that users sign in with their MIT emails, and click on a verification link in their email to make sure they are MIT students and that the email address is theirs.

Validation
A risk we have identified is that lend and return requests can be spammed to congest the system or make others' experiences miserable. To mitigate this, we will require end-to-end validation on both parties of the request. We will also have automatic checks in place to filter out duplicate requests.

Legality
Another risk is users potentially lending illegal items. To mitigate this, we will have user moderation and reporting to help keep our system legal.

Moderation
A final risk is that items that are lent could possibly not be returned. To mitigate this, we will have a user trustworthiness level that comes from ratings by other users. This will help users decide for themselves who they can lend to or borrow from.

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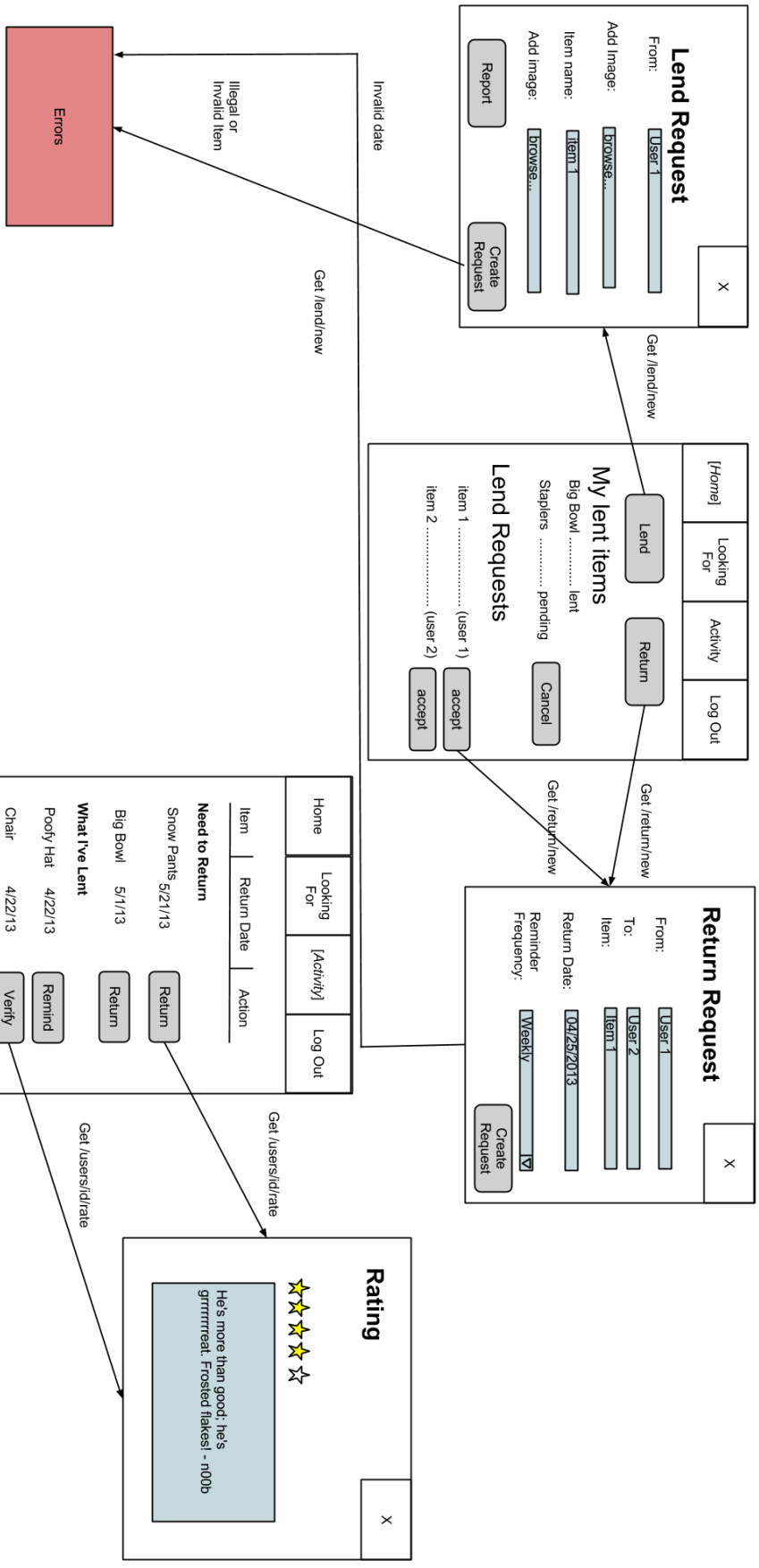

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Challenges

Design challenges

Lending/returning money and items
Money and items are sometimes lent in different ways, however we want to make a site that can be applicable and helpful in all use cases. For example, items can be requested, and then once the request has been fulfilled, users can issue a return for the item. However, money is often lent when immediately needed, so the user would only need to request a return. Our application will allow users to make return requests without having the need to have made a lend request first.

Guarantee of loans occurring
It's difficult to guarantee for sure that a loan has actually occurred. We don't want users lying and saying they've successfully lent out items, in an attempt to increase their trustworthiness factor. We will have the user on the lending and receiving end verify that a loan has occurred, or that money is owed.

Tasks

List of tasks, expected effort, allocation to team members

Features in MVP:

- User registration/validation: allow users to sign up for the site with MIT email and send them a confirmation email after they have signed up to ensure that they are MIT students.
    - Includes: Sign up/in, verifying MIT email used, verification email
    - Time: 5 hours
    - Member: Stephanie
- Lend requests: allow users to submit a request asking for an item that they would like to borrow.
    - Includes: Create request for item, have other user verify
    - Time: 5 hours
    - Member: Paul, Jason
- Return requests: allow users to submit a request asking for an item back by a certain date. Allow user to specify how frequently they want to send reminders to the other person.
    - Includes: Create request for item return, include email reminders, have other user verify
    - Time: 5 hours
    - Member: Jason, Paul
- Email reminders
    - Includes: Change frequency of reminders for each return request
    - Time: 5 hours
    - Member: Sarah

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Features Beyond MVP:

- User Ratings: allow users to rate other users on a scale from 1 to 5, where 5 represents extremely trustworthy and 1 represents not trustworthy at all.
    - Includes: Rate users, update ratings, and view other users' ratings
    - Time: 5 hours
    - Member: Sarah, Paul
- Report requests: allow users to report items that they view as dangerous or illegal. Allow users to report other users as well.
    - Includes: Request items/users and include descriptions
    - Time: 5 hours
    - Member: Jason, Stephanie
- Tagging: allow users to tags requests for easier filtering and searching
    - Includes: Tag system and connections to requests
    - Time: 5 hours
    - Member: Paul, Sarah, Stephanie, Jason
- Images: add images to requests for better user experience
    - Includes: Store images in database
    - Time: 3 hours
    - Member: Jason
- User Interface
    - Includes: Add AJAX requests for features (ex: user ratings), improve UI
    - Time: 10 hours
    - Member: Paul, Sarah, Stephanie, Jason

Features Beyond This Course:

- *Maps: allow users to specify their locations on a map*
- *Notification: Showing notifications indicating number of items to be returned*

Expected effort: each member is expected to share equal work and work on the project for at least 7 hours per week. Meetings are held at least once a week for at most 2 hours each. Each member will also look over code added to the project, so that they understand the current state of the application, how different parts are working together, and can review each others' code practices.

Calendar of intermediate and final milestones for tasks

(class deadlines in black, ours in blue)

- Sunday April 21, 11:59pm: P 4.1 due
    - Design document
- Wednesday April 24th - some MVP implementation
    - Working sign up with email verification

    - Beginning to create basic lend and return requests
    - Beginning email reminders implementation
    - Basic tests for MVP features
- Sunday April 28, 11:59pm: P 4.2 due
    - MVP implementation
    - Programming: basic code only
- Monday April 29, 9:00am: P 4.2 demo due
    - MVP demo
- Wednesday May 1st
    - Ability to report items/users
    - Ability to rate users
    - Starting tags/images
    - Improved UI
- Sunday May 5, 11:59pm: P 4.3 due
    - Final product
    - Final design doc (update to reflect changes)
- Wednesday May 8, 9:00am: Project fair
    - Demo of final product
- Sunday May 12, 11:59pm: P 4.4 due
    - Final code (all parts, including unit tests)
    - Final design doc (updated to reflect changes)
    - Design Evaluation
    - Team Evaluation

Minimum viable product

Identification of minimum viable product for first release

The MVP will include the ability to verify MIT accounts. Users can make a lend request for a specific item based on text input. They can also make a return request and specify a return date based on existing lend request. SnapBack will send a reminder email to the borrower if the return request is verified by both parties.

This first prototype will still be able to provide value to users in that users will be able to use SnapBack to make requests for items they need, items they want to return, and report items and users for invalid or illegal use. This will also provide a great opportunity for feedback from both team members and friends. We will make sure to have enough time in our process of designing and implementing to utilize user criticism to improve our application. We also believe this is a stepping stone to our final product in that all of the current features can be augmented and improved in the final product.

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Subset of features to be included

We will include the following features for our first release of the product:

- User registration and validation
- Lend requests
- Return requests
- Email reminders and scheduling frequency

Issues postponed

The MVP includes only basic functionalities. Security mitigations will be examined once we finish building the site structure because at that point we will have a clearer direction of security concerns. Beautiful user interface elements will also be included after the MVP is done.

We will also postpone more extraneous features like

- Report requests
- Item Tags/Searching
- Trustworthiness Ratings
- Images on items

Provides real value to users

The MVP will allow users basic functionality of the application, which includes making lend and return requests. This is really the core use of the site. Our other features, such as a item images and tags, ratings, and reporting, can be postponed for our final product, as they aren't necessary for a basic idea of the application.

Provides opportunity for feedback

Since the MVP includes basic functionalities of the application, it gives people who evaluate our application a good idea of what SnapBack does. The MVP will have enough features for them to provide feedback on things to add or change. Moreover, there are several possible extensions to be added to the MVP, so there is always room for improvement based on this feedback. It will let us know if how we should add the items in our 'issues postponed' section.

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On path to full product

We will include the following additional features for the full product:

1. Trustworthiness rating
2. Tag for items for search feature
3. Images for items in lend requests
4. Report requests
5. ***~~Notifications for items you need to return~~ No notifications***