

# RoomEase Software Requirements Specification

Alex Vrhel  
(avrhel)

Cheryl Wang (cwang7)

Jakob Sunde  
(jsunde)

Matt Mans (mans1626)

Omar AlSughayer (oasugher)

Sid Gorti (sgorti3)

Weijia Dai (weijid)

## Project Description

### What is it:

RoomEase is a roommate coordination app which provides a better experience of living together. Its main goal is to help roommates manage shared resources and monitor responsibilities.

### Problems it solves:

- One's routine could collide with that of their roommates. E.g. watching different TV shows at the same time or taking morning showers around the same time.
- Food in common storage units would often rot before anyone have removed it.
- Meeting with all roommates to create a shared document, such as a roommate agreement or a shopping list, and then handing everyone a copy tends to be hard. Making sure that every roommate has a copy of said document is equally tough as well.

### Features:

#### Reservation

*Main Goal*

Allows users to reserve any of the common resources (e.g. TV, kitchen, etc.) for a specified period of time.

#### Food Management

*Main Goal*

List all food items in the fridge or storage, who is it owned by, and the expiration date on every item. This feature also notifies users when an item approaches its expiration date regardless of owner.

#### Shared List

*Main Goal*

Gives the option of creating mutable or immutable lists that can be viewed by all or some roommates.

#### Reminders Feed

*Main Goal*

Personal, regularly updated feed of chores, reservations, nearly-expired food, and to-do's.

### Alternatives:

Roommates could choose to coordinate amongst each other verbally, by using any texting service, or a standard scheduling app. What sets RoomEase aside from all of this is that integrates all of these into one and provides a record of past interactions as well.

### Product v. RoomEase

#### Home Slice

Home Slice can be used in only two areas when put in contrast to RoomEase. It functions either as a shared list, or to keep track of roommates' debts to each other. It does not provide any of the extra functionality that RoomEase provides.

#### Roommates

Although Roommates provides most of the functionality RoomEase intends to, it falls short with its user-unfriendly UI that can be hard to understand. It also does not attempt to address the food management problem that RoomEase solves.

### **My Roommates**

Like Roommates, My Roommates does not provide any food management functionality either. It is also only available on Android which makes it less ideal when roommates do not use the same operating system.

## **Non-functional requirements:**

### **Usability**

We recognize that having to type into your phone the expiry date of every item you buy is annoying, and so is typing before using the TV. Therefore, every task accomplished by RoomEase should be achievable in no more than a few buttons presses as not to bore the user away.

### **Availability**

To ease communication between roommates with different operating systems, RoomEase has to be runnable cross-platforms. Mainly on iOS and Android.

### **Performance**

Under optimal network conditions, no screen should load for more than two seconds. Otherwise, users will be less willing to use our product.

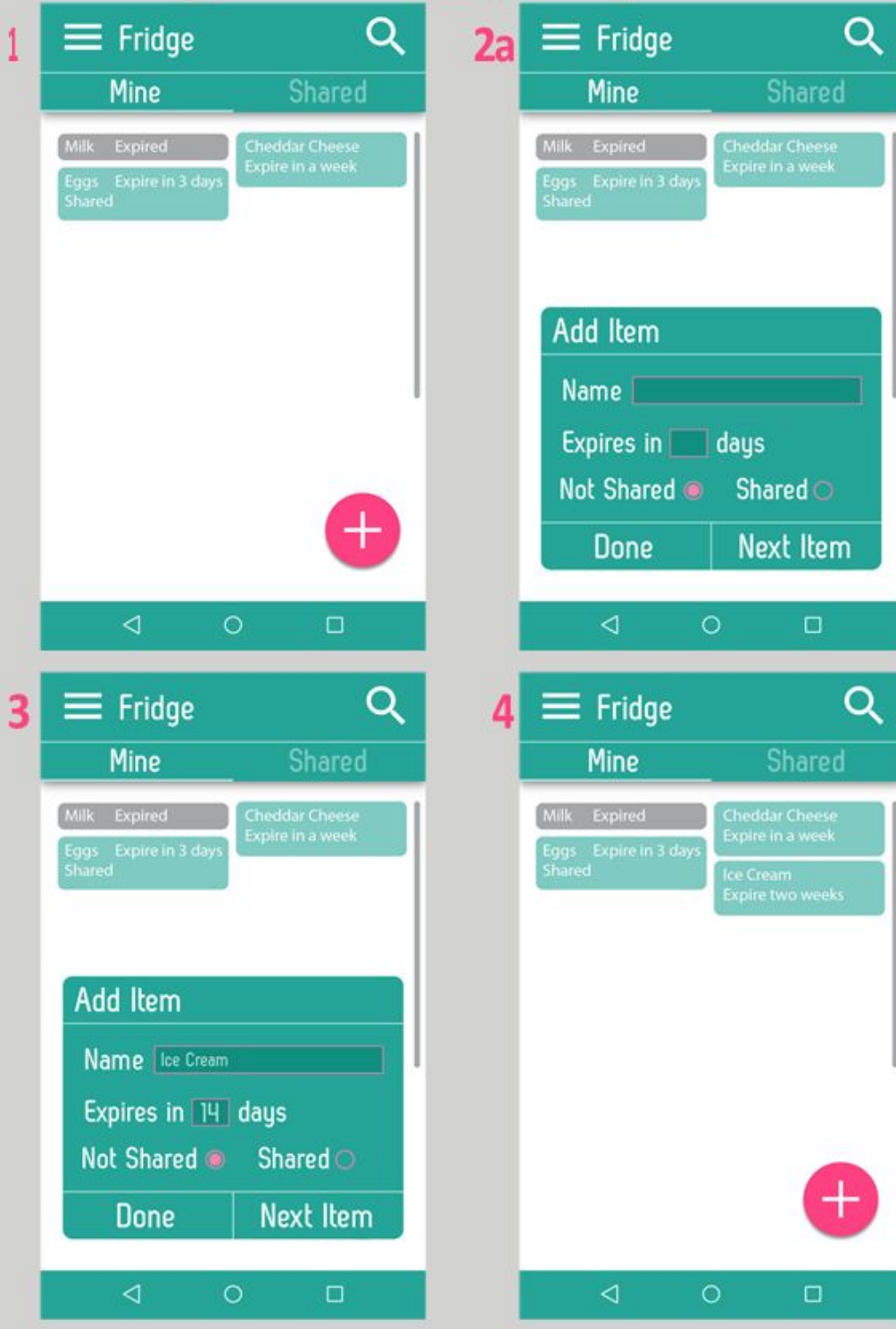
### **Accessibility**

Despite using server-stored databases, our app should still be accessible offline. Other than Who's Home, the latest-viewed version of the contents of the fridge, shared lists, reservations, and reminders feed should be available.

## **Documentation:**

RoomEase's UI is going to be enough to explain the flow of the program and how tasks are completed. However, Users also will be able to report any bug they encountered to the developers through a Google form linked to within the app.

## II. Adding Item to Fridge/Pantry



### III. Adding Item to shared list (Scheduler)

1



2-3



In this special case the content of the item being added is decided by which resource (either shower, laundry, or TV) is currently selected.

4



4-5



In this case the calendar and clock are used to enter the times in which they would like reserve the current resource.

## Use Cases

### I. Signing up with roommates

**Precondition:** User has downloaded the app

**Trigger:** User opens the app for the first time

**Success condition:** User has created a RoomEase group with their roommates

**End failure condition:** User has not created a RoomEase group, or their roommates could not all join it

**Steps to success condition:**

1. User authenticates their identity via facebook login
2. User indicates they want to create a new group
3. User is given a group name and password to share with their roommates
4. User's roommates download the application and perform step 1
5. User's roommates indicate they want to join a group
6. User's roommates use the given group name and password to indicate they will join the user's group
7. All roommates are logged in and in a group together

**Extensions (error scenarios):**

- 1a. User does not provide correct Facebook login info
  - 1a.1 App returns user to login screen
  - 1a.2 User tries again or backs out
- 6a. Roommate enters incorrect information when attempting to join user's group
  - 6a.1 App displays a message informing them the group was not found
  - 6a.2 Roommate tries to enter the information again or backs out

### II. Adding an item to the fridge

**Precondition:** User is logged into the app

**Trigger:** User goes to the fridge screen while putting away food

**Success condition:** User's food item and its relevant info is visible to their group

**End failure condition:** User's food item is not entered into the system

**Steps to success condition:**

1. User presses a button indicating they want to add a food item
2. Application prompts user to enter information about the item
  - a. User is prompted for name, expiration date, and sharing settings
3. User enters the relevant information and puts the food item away
4. If the item was labeled as shared then it is now visible to all roommates in the group in the Shared section of their Fridge
5. If the item was labeled as non sharable then it is not visible only to this one user in the Mine section of his Fridge

### III. Adding an item to a shared list

**Precondition:** User is logged into the app

**Trigger:** User has the app open and wants to add an item to a list for their group to see

**Success condition:** The item has been added to the list, all group members can see it

**End failure condition:** The item was not added, group does not see the new item

**Steps to success condition:**

1. User navigates to one of the shared lists screen on the application
2. User press-holds on the list that they would like to add to, from a selection of all existing lists for their group
3. User enters the content of the item they would like to add in the greyed-out item field.
4. User indicates they are done, and the item is added to the specified list, now visible to all group members

**Variations:**

- 2a. User may add a new list rather than selecting an existing list
- 2a.1 User presses the add button before selecting any existing list
  - 2a.2 User enters a name for the new list and populates it with items

## IV. Editing an item on a shared list

**Precondition:** User is logged into the app, at least one list has an item on it

**Trigger:** User wishes to change an item of an item on a list

**Success condition:** The item has been modified on the list, all group members can see the change

**End failure condition:** The item was not added, group does not see the changes for the item

**Steps to success condition:**

1. User selects the “shared lists” screen from the menu at the landing screen
2. User press-holds the list that they would like to edit
3. User edits the content the list as desired
4. User confirms their changes to the list

**Extensions (error scenarios):**

- 7a. User attempts to delete/edit an item while their roommate also edits/deletes the same item
- 7a.1 System will reflect the changes that were made and confirmed most recently
  - 7a.2 User whose changes were overwritten backs out, accepting their roommate’s edit, or tries again

**Variations:**

- 3a. User may change the list as a whole rather than a single item
  - 3a.2 Use case continues as above, but for the list rather than a single item
- 5a. User indicates they want to delete the item
  - 5a.1 User backspaces all content from that item’s field

For the use cases above, the main failure condition would be caused by an error in the system (the changes made on a user’s app aren’t properly transmitted to the data that our system stores), which will ideally be ironed out as we design our front end and back end, or by an issue in the user interface (such as confusion in how to proceed with their desired action). Since most of the use cases are simple sequences of operations within the UI, we will make it a main goal of our project that the UI flows logically and is very responsive, so that users don’t fail these use cases due to confusion or frustration.

We feel that the use cases listed above cover the important scenarios, because adding items to lists and editing/removing those items are the core action behind many of the different modules of the application (including the fridge management, shared lists, chore schedules, and reservation portions of the app). Although the cases may vary slightly, such as what options need to be entered in or the details of the UI at these different screens, the core process is very

similar. Thus, outlining how to sign up and how to interact with these list modules covers the functionality of the app at a high level.

## Process Description

### Software Toolset

#### *Client Application:*

The client application will be developed using Phonegap. Phonegap uses CSS, HTML and Javascript for designing the client application. We decided to use Phonegap, since it allows us to develop one application and compile for multiple platforms. This is important for development, as we want to deploy for Android and IOS to allow nearly all roommates to use the application. Development for IOS and Android has a steep learning curve, and given the tight timeline, it is easier to learn HTML/CSS/JS from scratch than development for IOS or Android.

We will use Materialize for stylizing the application. Materialize provides CSS/HTML/JS implementations for common UI animations and layouts, and therefore we will not have to spend time developing this portion of the UI.

#### *Server Application:*

The application will be accessing resources from the internet and therefore a server application will be required. The server application will be developed using Node.JS. Node.JS is relatively simple for new users to learn, and since PHP is relatively difficult to develop with, Node.JS is the best option.

The server application will be hosted using AWS for the reliability and ease of use of the service.

#### *Database:*

The application needs to access data from a database and push requests offline and therefore a database is needed. PouchDB will be used for queueing requests offline then pushing them into CouchDB.

#### *Source Control:*

We will use git and host our project on github, since all team member know git and hosting on github allows us to make our source code public.

#### *Task Tracking and Bug Reporting:*

We will use Google Docs to keep a list of what tasks are currently being worked on, what tasks are completed, what needs to be completed and what bugs are currently present in the application. A formal task tracking tool is unnecessary for a project of this scope.

### Group Dynamics

Alex is serving as the team's Project Manager, and all other group members will share in development, with some specialization. Specifically, Cheryl, Sidd, and Jakob will be working primarily on front end development and UI design, while Matt, Omar, and Weijia will be working more on the back end of the application. These roles were chosen according to our group member's preferences and strengths, although they are flexible and may change as we progress and help is needed in various areas. Disagreements will be handled by taking the issue to the group and deciding democratically, which has proved easy so far due to our open communication channel through Slack. As the PM, Alex is willing to step in to resolve conflicts and mediate issues between group members if necessary. We feel that deciding things as a



group when possible is the best method, since everyone has a chance to make their voice heard and be a part of the decision.

## Schedule/Timeline

**Set / Flexible (DD = developer days)**

**Feb 01:** Set up PhoneGap Project (1 DD, Jakob)

Set up developer website (3 DD, Sidd)

Setup PouchDB/Azure Server (2 DD, Jakob/Matt)

**Feb 04:** Routing logic (2 DD, Jakob/Matt/Sidd)

Request handler (4 DD Matt)

Local Storage (2 DD Omar)

Initial unit testing (2 DD, Corie/Matt)

**Feb 08: Zero-feature release (Packaging/debugging: 1 DD, Alex)**

Initial implementation of list module (3 DD, Cheryl/Alex/Jakob)

Automated testing (4 DD Jakob/Alex)

**Feb 12:**

Full implementation of list module (6 DD, Cheryl/Jakob)

Initial implementation of reservation module (3 DD, Matt)

Facebook login integrated (3 DD, Omar/Sidd)

**Feb 16:**

Initial implementation of fridge module (3 DD, Jakob/Corie)

Front-end styling (4 DD, Jakob/Sidd)

Front-end: full interactivity & integration with backend (6 DD, Cheryl/Jakob)

**Feb 17-18:**

Testing suite improved (5 DD, Omar/Cheryl/Corie/Matt)

Group login initially implemented (6 DD, Omar/Sidd/Matt/Alex)

Bugs discovered and fixed (8 DD, Cheryl/Alex/Omar/Sidd/Corie)

**Feb 19: Beta Release (Packaging/debugging: 1 DD, Alex)**

**Feb 24 - 25:**

Full implementation of fridge module (4 DD, Jakob/Sidd)

- Fridge history/autocomplete stretch goal (4 DD, Jakob/Sidd)

Full implementation of reservation module (5 DD, Alex/Jakob/Matt)

Test coverage tool (3 DD, Omar/Alex/Jakob)

Group login fully implemented (5 DD, Sidd/Alex/Matt/Omar)

**Feb 26: Feature-complete release (Packaging/debugging: 4 DD, Alex/Jakob/Sidd/Matt)**

**Feb 26 - March 03:**

Test suite finished (8 DD, Corie/Cheryl/Matt/Omar)

Syncing paradigm fixed (pull to refresh) (3 DD, Matt/Alex)

Feed module implementation (4 DD, Jakob/Alex)

Code review (1 DD, Sidd)

Code refactor (2 DD, Alex/Jakob)

User testing (1 DD, Alex/Jakob)

Styling/UI Polish (8DD, Jakob/Sidd/Alex/Cheryl)

Bugs discovered and fixed (10DD, Matt/Jakob/Cheryl/Alex/Omar/Sidd/Corie)

**March 04: Release candidate & user testing**

**March 08: Final release**

## JUSTIFICATIONS:

We want half of our app's functionality by the zero feature release because of the short amount of time between ZFR and beta release. Much of our app is UI based and it is critical that we leave

enough time for testing, and get features working early enough to get user feedback. For our back end, we want to make sure that our app can communicate with our database by ZFR, since we need to have our back end working and communicating with both our app and our database by the beta release. We want to do at least some early user testing so we can identify early on what some of the potential issues may be.

### **Risk Summary**

#### **1. Risks to the project caused by inadequate or untestable requirements.**

Coming up with good and complete requirements is difficult. The functionality of RoomEase are hard to convey precisely and in detail. Moreover, the requirements are hard to communicate effectively for a group of size 7. To reduce this risk, we will try to make our project requirements as detailed as possible during the early stages of development. This also forces us to actively receive feedback from TAs early so we reduce the risk of needing to change our requirements in the future. If we still encounter any problems caused by inadequate requirements, we may adjust our requirements and change our approach so we can deliver our product on time.

#### **2. Risks of changing software toolkit**

It is possible that some of the software tools we listed do not work as we expected, or the learning curve associated with the tool is too high. In that case, we will need to find alternative tools. To reduce the risk of changing tools, early on we will experiment with the tools we have chosen so we can see if we need to change the tools we need to use. Even though it is unlikely to happen, if we realise we need to change a tool in the middle of development, we will have to adjust our group dynamics, having one person search for alternatives and others making sure all the other parts of the project are no longer dependent on the old tool. Considering the ramp-up time of getting familiar with a new tool, we will have to change our schedule to accommodate.

#### **3. Risk of not achieving deadlines**

Even though we have set milestones for our project, things can go wrong and this makes estimating progress difficult. In order to meet the deadlines, our group will have team meetings frequently to assess our progress. We will also aim to finish things ahead of the specified deadline so we have extra time in case things do not go as planned. When things do go wrong, we will shift the duties of different teammates to help address the issue at hand. If we encounter a major issue that pushes our deadlines extremely far back, we may have to cut features.

#### **4. Risks of non user friendly UI**

We are trying our best to make our UI clear and user friendly. To ensure usability, we have had multiple team meetings exclusively for the UI design, and we will continue to do so as the project progresses. Also, we will make sure to continuously show the UI design to our TAs and friends to continuously improve it based on feedback. If we have to modify our UI after it is linked with the backend, we will have to make sure that our changes to the front end do not require heavy changes to the backend. Also we will adjust our group dynamics as needed.

#### **5. Risks of failing to deliver the app of both Android and iOS**

One of the main things that sets aside from our competitors is delivering our app cross-platform which allows nearly all roommates to use the app. Failing to do so could render our app useless as limiting the usage to half a house's population does not solve the problems the app is set to solve. Although PhoneGap works greatly to minimize this risk, plugins and platform-specific pugs still raise the same risk.

Generally speaking, the feedback from users will be the most useful at the beginning of project development. At initial stage, things are not settled yet and the cost of making even drastic changes is comparatively low. Therefore, we will seize our time and ask for as much feedback as possible before our zero-feature release.

## Design Changes and Rationale, Beta Release 02/18/2016:

### Project Description

- Features.Shared Lists: This feature will *not* come with a built-in Roommate Agreement list that the user is prompted add.
  - We removed this built-in list because we think that the majority of the users will not use it; and it is distracting from the main purpose behind shared lists.
- Documentation: We are going to add the ability to report bugs to the developers.
  - The in-app HELP section and the UI should be more than enough to guide the user through the app. HELP, however, won't be beneficial to the user when they encounter a bug in the system. Therefore we had to add a bug report.

### Use Cases

- Use Case II.2.a: Expiration date of an item is to be inputted as a calendar date instead of number of days from present.
  - We chose to not prompt the user to enter expiration dates in number of days from present because we think it is a burden for the user to have to calculate this number.

### Process Description

- Databases Backend is now implemented using PouchDB and CouchDB instead of DynamoDB and AWS.
  - Through development we decided that we want the user to be able to push requests to the database while offline. PouchDB allows the functionality of queueing requests offline then pushing them into a CouchDB database once an Internet connection have been established, while DynamoDB does not. For this reason we decided to switch away from DynamoDB.
- Schedule.Feb 16: Fridge management feature is not to be completed by this date anymore. Instead, Facebook login, shared lists, and reservations are fully functional.
  - We originally decided to first finish implementing shared lists completely, by then we recognize that reservations share a much closer resemblance to shared lists. So, it was more logical to build reservations on top of shared lists before implementing fridge management.
- Risk Summary: Add 5. Risk of failing to deliver our product on both Android and iOS.
  - Having our app run cross-platform is essential to set it apart from our competitors and allow for full communication among roommates. Initially, we did not consider this a risk because PhoneGap advertises itself as being fully functional on Android and iOS. We later found out though, while implementing Facebook login, that PhoneGap's plugins and Facebook's developers restrictions could restrict the compatibility of our code cross-platform. We also encountered platform-specific bugs that required many hours of debugging. All of these issues have been solved so far but a new risk have been realized.

## Design Changes and Rationale, Feature Complete Release 03/04/2016:

### Project Description

- Problems: Our app does *not* solve the chores scheduling problem anymore.
  - Due to time constraints, we had to drop the Chores feature.
- Features.Shared Lists: all lists are mutable and viewable by all users now.
  - We decided that making personal lists is out of the scope of the problems that our app wants to solve, and so is making immutable lists.
- Features: Removed all stretch goals.
  - Stretch goals were listed to implement if and only if all other features were completed way ahead of schedule. We came to find out that we are operating per schedule, not faster nor slower.
- Documentation: No HELP section is going to be included in-app anymore.
  - Field testing showed that the UI is more than enough to explain how the app works.

### Use Cases

- Use Case I.3: Users are not invited to join a group by their email anymore.
  - Inviting users through their email addresses creates many issues that have to be resolved. What if a user does not have a Facebook account? How to validate that an email is valid? etc. It also adds another prerequisite the user has to complete before accessing the app, so we decided it was more trouble to both the user and the developer than it was worth it.
- Use Case I.6: Users do not use the content of an email to join a group anymore.
  - Since inviting by email was removed, then obviously the user cannot use the content of an email that have not been sent to join a group.
- Use Case I.3a: this is not a valid extension anymore
  - This is because inviting by email have been changed to name and password sharing.
- Use Case I.Variation: There are no variations anymore
  - Variations were meant to be other possible ways we might implement the use case in. Now that our program is finalized, the variation section serves no purpose.
- Use Case II: The name of the food management section have been changed to Fridge.
  - We think Fridge follows the same one-worded naming convention we used to name all the other features, and is even catchier.
- Use Case II.4: An item is not visible to all users anymore except if it was labeled as shared.
  - User testing told us that a user would not be interested to see someone else's food that is not shared. So, we decided to show every user only their food and shared food as well.
- Use Case III.2: Editing a list is initiated by press-holding on it, not pressing anymore.
  - We found that press and hold is the more conventional way of editing items.
- Use Case III.3: User does not need to press a + button to add an item anymore.

- To make the UI more user friendly, we now have a greyed-out area to add a new item that should be more intuitive for the new user.
- Use Case III.variations.A: Shared List does not refer to Chores as well anymore.
  - Due to time constraints, we decided to remove the Chores module.
- Use Case III.variation.2a: User now can populate the list while creating it.
  - This was merely a point we forgot to mention originally.
- Use Case IV.trigger: There are not notification settings for items anymore.
  - For shared lists, we decided that a user would not usually want to be notified of an item. Rather, fridge and reservation items are what the user need to be notified for.
- Use Case IV.2: The user does not have to select an individual item withing a list to modify it anymore.
  - Having to select a list then select an item is troublesome to the user, especially since elements are only displayed as texts.
- Use Case III.3a: User interacts with the whole list in the same manner he interacts with a single item.
  - Unifying the way a user interacts with UI elements makes for a smoother user experience and a less steep learning curve.
- Use Case III.5a: User deletes an item by removing all content from its field, then the program deletes the field after updating.
  - Since items are not treated individually anymore, this had to be done.

#### Process Description

- Schedule.March 03, 04 - 08: No Stretch goals will be implemented anymore.
  - We decided that this time is better spent perfecting our main features rather than to try and half-implement stretch ones.