**Project Overview**

GroceryShip is a web application that facilitates peer grocery delivery. Students from the same college can post requests for groceries they need with a detailed description of the item/s. Students who are doing grocery shopping can then claim and fulfill these requests. Requesters specify how much they're willing to pay as a delivery fee and which pickup/delivery locations (dorms, living groups, other on-campus places) they prefer. Payments are made once delivery is complete and both parties indicate this in the app. We will focus on an implementation for MIT students first.

**Motivation**

MIT students are generally busy and do not have time to get groceries in grocery stores which are all quite far away from the main campus. This web application will allow those who are busy to get the groceries in less time and those who make it to grocery stores to earn pocket money by delivering groceries for peers.

Existing solutions include the delivery services of each grocery store (if it exists) and 3rd party delivery services such as Instacart. The main difference is that GroceryShip is a peer to peer delivery service where your peers help you buy your groceries. Users can also specify how much they're willing to pay as delivery fee whereas other services have a fixed delivery fee. Other services also have a minimum price or number of items you need to buy in order to avail of delivery, whereas with GroceryShip, you can request for any items.

**Definitions**

1. Shopper: user at a grocery store who is about to complete requests
2. Requester: user who needs items from the grocery store but can't go; makes a request on the app with the list of items he/she needs

**Concepts**

1. Request (MVP)

- **Purpose.** Allow requesters to inform shoppers about items they need and how much they are willing to pay for the delivery
- **Operational Principle.** A user fills out a request form under Requests, filling out each field to describe each item, the pickup location preference, and the delivery tip he/she is

willing to pay. The user clicks “Make Request” and all other users will be able to see the request on the request feeds.

2. Peer Delivery (MVP)

- **Purpose.** Allow shoppers to fulfill requests
- **Operational Principle.** A shopper views all the requests from a feed and clicks accept on a request to deliver items. The shopper buys the items, fills out the actual price for each item, then notifies the requester to meet at the pickup point. The shopper meet the requester and gives him/her the items. Finally, the requester makes the payment and gives rating for the shopper.

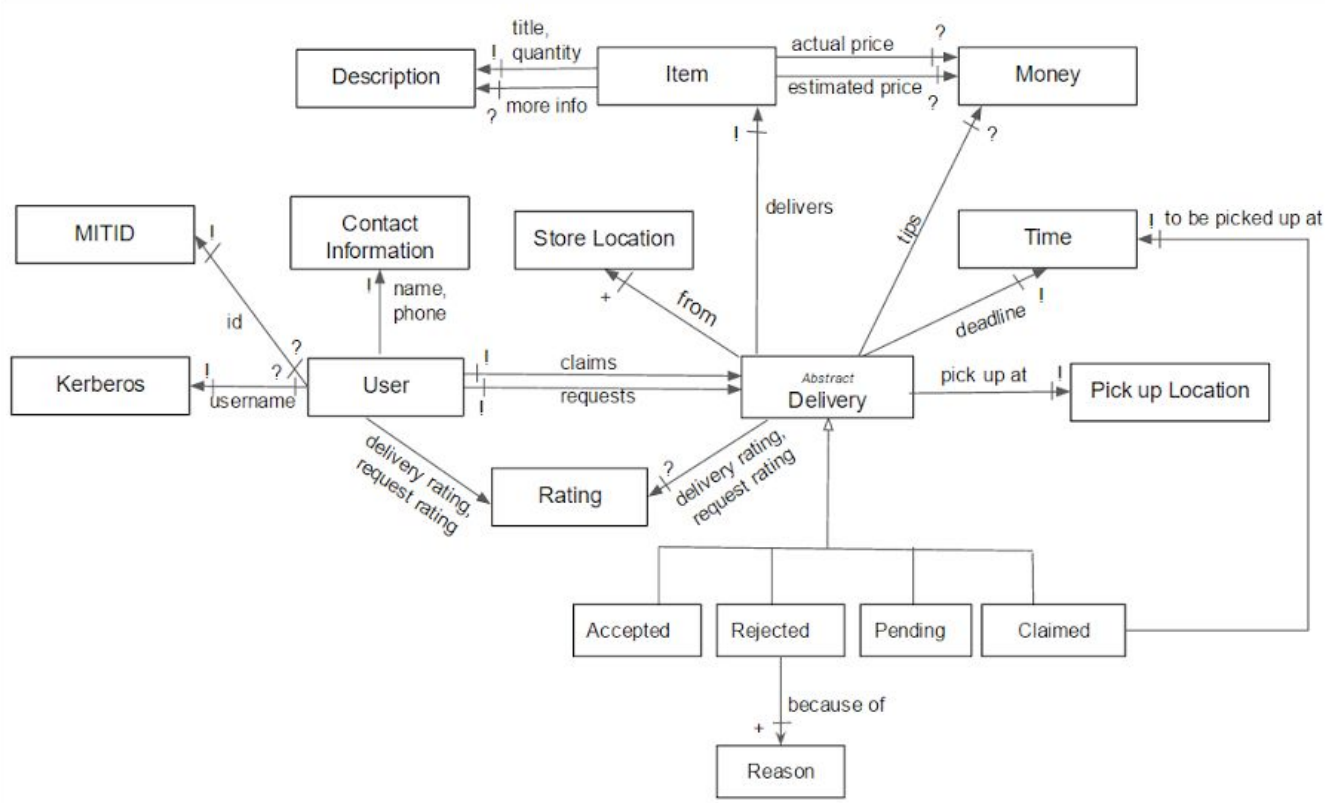
3. Rating

- **Purpose.** Allow the administrator to filter irresponsible users and provide better service quality and to incentivize well-behaved users
- **Operational Principle.** After each delivery, the requester and the deliverer give each other a rating by selecting from 1-5 stars, where 5 stars is the best rating. If it is not 5 stars, they will indicate with a comment why it is not. Users with an average of 3 stars or below are suspended.

**Anticipated Misfits**

- Users might randomly request items and not pick them up.
- Users might randomly claim requests and not buy the item/s and not deliver them.
- Shoppers might buy the wrong item.

**Data Model**



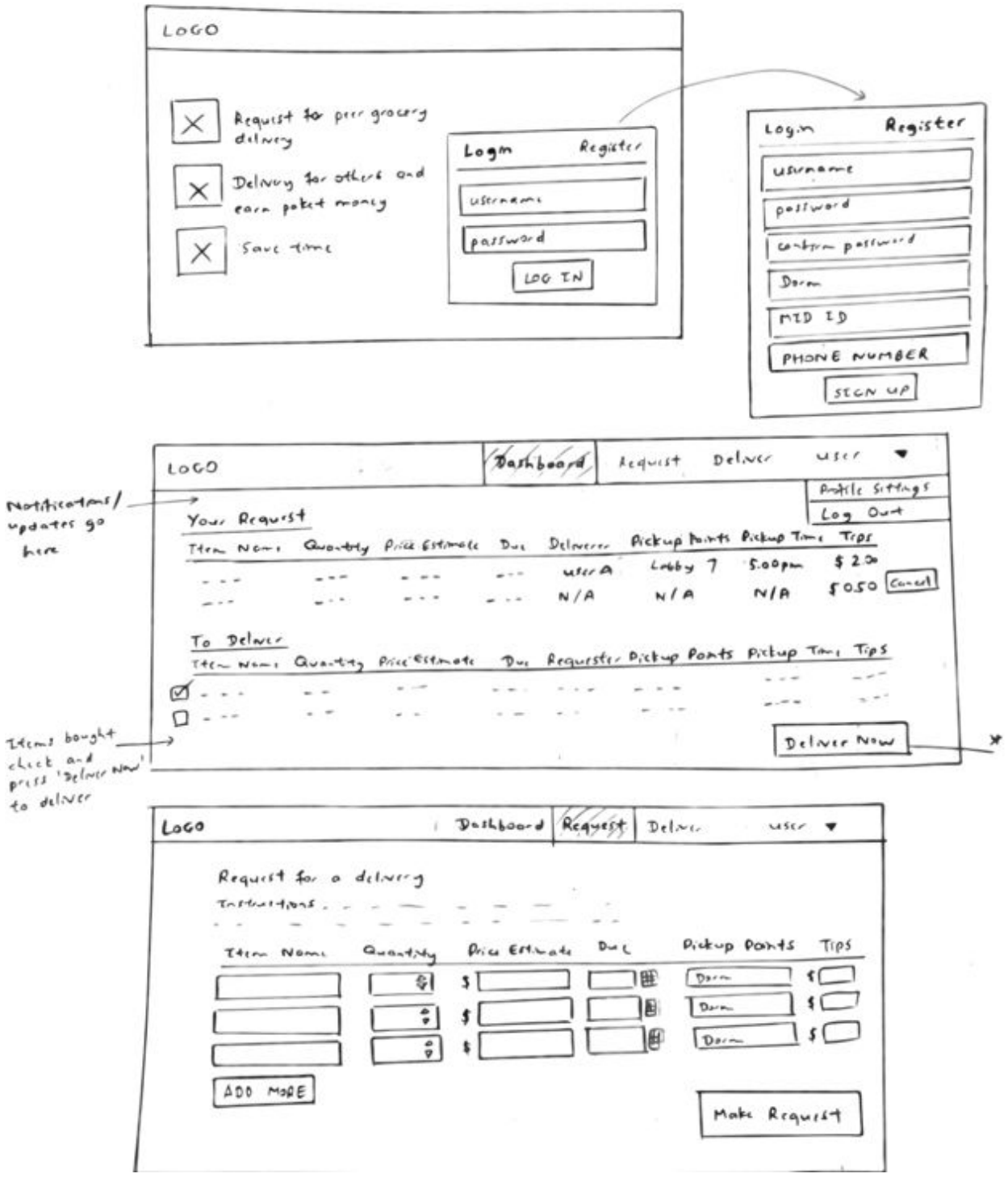

- Explanations
    - Requests start out as a Delivery that is Pending.
    - Pick up location is set by the User who requests the Delivery.
- Textual constraints
    - Requester and shopper of a request must be different users.
    - Delivery pickup time is before the request deadline.
    - The user who gave the delivery rating must have claimed a delivery corresponding to that rating. Similarly, the user who gave the request rating must have requested a delivery corresponding to that rating.
    - A delivery can only have delivery rating and request rating if it is an Accepted or Rejected delivery.
    - Users cannot claim their own requests.
    - Pick up time must be earlier than the due time.
    - Item of a “pending” delivery cannot have an actual price
- Insights

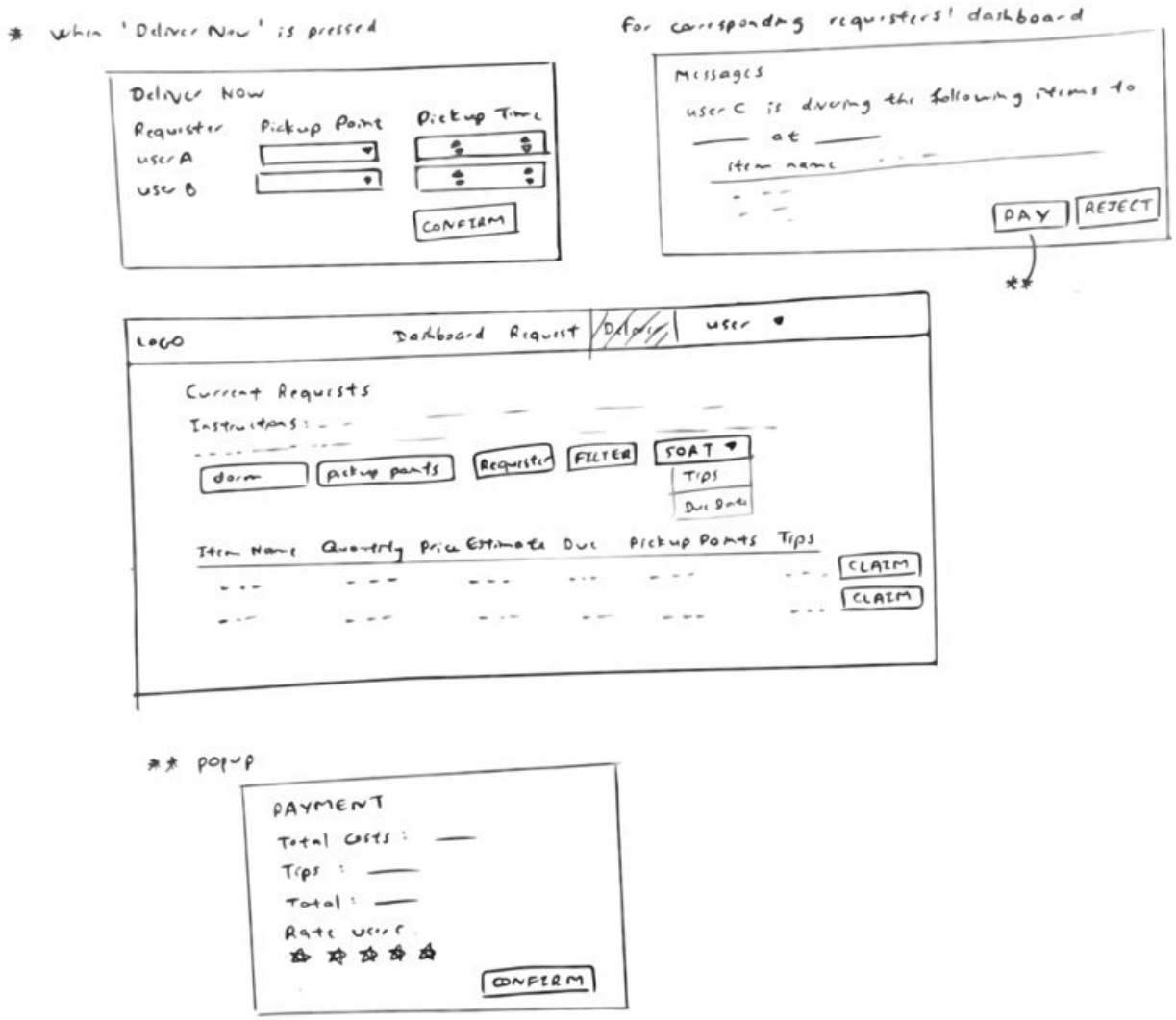
    - The concept of request and delivery turn out to be the same because a request eventually turns into a delivery so we decided to model them as one set, Delivery.

**Security Concerns**

- Summary of key security requirements and how addressed
    - No exposure of database details so that user and payment information aren't exposed and stolen.
    - Secure payments will be done using an existing secure payment method so that none of the transactions will be compromised.
    - Login validation will be used so that users can only make requests for themselves and do actions on them.
    - Passwords will be hashed so that no one's passwords are stolen.
    - Money amounts will be validated in the model (e.g. validate that the delivery tip is not negative) so amounts in transactions are will always be accurate.
    - Login is needed to access the database and all the actions on it are logged so that internal attacks have a threat of punishment.
- How standard web attacks (such as XSS, CSRF, etc) are mitigated
    - XSS: use Handlebars to render the text content of the request posted by the requester
    - CSRF: use secret session token from both cookie and form (double submit)
    - Login CSRF: use anonymous cookies with double submit
- Threat model
    - Attackers can be users who post requests containing text that invoke malicious scripts.
    - Attackers can be from other domains/websites.
    - Outside attackers don't and shouldn't have access to the server. Internal attackers (developers working on GroceryShip) fear the threat of punishment.

**User Interface**






**Design Risks**

- Deliverers might buy the wrong items.

  Solution:

  - Only allow grocery stores with full-refund policies.
  - Instruct the requesters to provide complete and precise item name and if possible additional description
- Irresponsible requesters or shoppers.

  Solution:

  Use user ratings and let user accepts terms and conditions of using the app

- Outsider takes the requested items.
  Solution:
    - Give the requester and deliverer a shared code.
- Fraudulent credit card
  Solution:
    - Use established secure money transaction method such as TechCash.

**Design choices**

- **Concepts:**
  Problem: Whether to just have the concept of “Delivery” or both “Request” and “Delivery”

  Option Chosen: We chose to have separate concepts called “Request” and “Peer Delivery” because in reality, they serve different purposes and it is better to have a concept for each purpose.

- **Data models:**
    - Problem: Whether to have “Request” and “Delivery” as separate fields, or merged as a single field.

      Option Chosen: We decided to merge the two concepts into a single field. This is because almost all the fields/information pertaining to “Request” is relevant to “Delivery” as well, as they are both requesting/delivering a common item, at a common pick-up point, etc. Hence, it is more sensible to represent them as a single transaction between the deliverer and the requester.

    - Problem: Our concepts are “Request” and “Peer Delivery”. One of the challenges is that a requester may want to request for multiple items at once and we allow that. However, there might not a deliverer who can get or find every item on the list especially if the items can only be bought from a specific grocery store.

Option chosen: After a request is made, instead of creating just one request, we will break request into multiple requests each containing only one item. That way, a shopper can claim any item he/she has time to find/get for the requester.

- **User interface:**

  Problem: Whether it is an issue to also include notifications on the dashboard along with the status of requests and deliveries because it might get too cluttered; what are the important things that a user needs to see right away

  Options:

  - Status of requests and deliveries, and notifications **(chosen)**
    - Pro: everything that the user needs is in his/her homepage
    - Con: it might get too cluttered with many requests and notifications
  - Just status of requests and deliveries (use another tab for notifications)
    - Pro: clutter in the dashboard is prevented
    - Con: users won't be able to see the notifications right away