Motivation

UGift is an online app to help a group of people select a gift for someone. It supports assembling the group, making and sharing suggestions for the gift, agreeing on the gift, and dividing the costs. It does not provide the actual purchase of gifts or transfer of payments.

The purposes of UGift are as follows:

- **Simplify the process of selecting a gift, especially amongst a large number of people who may not know each other.** In particular, UGift seeks to centralize the state of the deliberation process (and the list of gift suggestions) in a single, attractive interface; to make it easier and more pleasant to negotiate the size of the financial contributions; and also to track whether members of the group have made their contributions to the payment.

- **Serve as an advertising platform for vendors.** By aggregating groups of users together whose goal is to make purchases, UGift is an ideal target for directed product advertising for vendors, both independent or general retail.

- **(Potentially) provide a general forum for the coordination of group expenditures.** UGift's platform might also be suitable for general situations where groups of people need to make some purchase requiring a degree of discussion and coordination, i.e., not necessarily a single gift for a single person.

Context Diagram
Concepts

**Cabal**: An ad hoc group of users that join together to select a gift. A cabal is associated with only one gift, so there is no separate concept of a gift, ruling out the possibility of a cabal deliberating over several distinct gifts. A cabal has a name chosen by its creator used to distinguish it in the UI from other cabals created by the same person.

**Item**: Something that can be given as a gift. It may be a concrete item (eg, a book), a service (eg, an airline flight, a massage) or perhaps a coupon. The item need not be a commodity; it may be a one-off (eg, a piece of art, or a craft object on Etsy.com). An item must be identifiable by a URL to an online retailer. Generally, this will preclude an item consisting of multiple things, unless (a) they are already packaged together for sale as a single item by the retailer, or (b) the retailer’s website provides a facility to save a shopping cart and provide a link for sharing it.

**Voting**: Members can indicate using up and down votes which items they prefer. They can also make comments about individual items. Also, any member can add a suggestion of an item to a cabal, by providing a descriptor, a price, a title, and optionally a brief textual description. Suggestions cannot be withdrawn.

**Pledging**: Users provide a “pledge” to indicate the upper and lower bounds of their contributions. Pledges are not item-specific; rather a single pledge is made by each user for all the items under consideration. Pledges can be private or revealed to other members of the cabal and are used to constrain the final choice of item, and perhaps also the display of suggestions.

**Cost Sharing Scheme**: The app might provide different options for how pledges are treated (private or public) and how costs are divided. For example, each member of the cabal might pay the same amount, with the cost of the selected item being at most the number of members multiplied by the smallest pledge; or members might pay different amounts according to some scheme.
Data Model

Additional constraints:
— At most one vote per member/item pair

Design Challenges

**How are large cabals created?** For small cabals, emailing each member with an invitation makes sense. But for a large one (convened eg to make a class gift), not all email addresses might be available.

Potential Solutions:

— *Provide public cabals that people can request to join* -- this then creates an issue of whether members are allowed to leave cabals in such circumstances. Allowing this could complicate or even compromise the integrity of cabals.

— *Let members invite other members* -- a lightweight solution which mimics the process of cabal creation with the initial invitations from the cabal organizer. However, the cabal owner would therefore lose control over membership, creating issues depending on the trust model between cabal organizer and the members he or she initially invites.

— *Use or create a credential that enables recipient to join, but limited in some way (e.g., by*
Less flexible than the prior option, but also carries a similar issue about the degree of trust between the cabal organizer and holders of these credentials.

What if item price changes? This will be especially problematic if pledging is taken to be contractual.

Potential Solutions:

— Organizer can reset the price -- Least desirable, since all pledging must start over with the new price. This is especially onerous because prices are auto-tuned daily on many sites like Amazon.

— (If price increases) App can contact pledged members to request they increase their pledges, or just automatically increase the amount paid by each until the current set of pledges cannot match the price -- Lightweight and convenient solution for organizers. Site can automatically detect price changes, or organizers can submit price changes. Organizers then directly handle cases where the current pledges cannot handle the increase in price.

— (If price decreases) Lower member pledges uniformly -- Possible that price can be lowered too much that members are paying nearly nothing. Could create issues where the cost-to-member ratio is unreasonable. Ignore for now, leave to organizers.

What do pledges mean?

Potential Solutions:

— The minimum indicates the cheapest gift the member thinks is suitable -- This would implicitly be covered in user suggestions and voting, and conflicts with what a "maximum" should be (see mark four below).

— The minimum indicates an amount the member is definitely willing to pay -- Hard requirement for the organizers to be able to synthesize pledges and make a purchase. Logically consistent with the concept of a "maximum pledge" in mark four, and together provide the most useful information to the cabal organizer.

— The maximum indicates the largest amount the member is definitely willing to pay -- This can be difficult to assess, and enforcing this could be problematic. Organizers will likely wish to be conservative and only purchase gifts whose price can be met by minimum pledges, or close to it.

— The maximum indicates the largest amount the member may be willing to pay -- This option would allow some flexibility in the face of price increases. The system can e-mail users who still have a "gap" between the current cost division assigned to them and their maximum pledge; or, organizers can directly suggest to members who have pledged more whether they would be willing to meet their maximum pledge, and if not, perhaps begin
suggestions and voting on a new item.

**Should members be able to drop out, or reduce a pledge?** This might eliminate items that were previously acceptable. There is also an issue of breach of contract if the item has already been purchased.

Potential Solutions:

— *Forbid decreases to pledges or dropouts (except perhaps with organizer approval)* -- Best way to maintain integrity of cabals as far as app is concerned, and the satisfaction of organizers is perhaps more important than that of general members in the app. If dropouts are not allowed, there will be a greater psychological "barrier to entry" for users accepting invitations, which would translate to a greater likelihood of cooperation down the line.

— *Allow decreases to pledges or dropouts* -- In cases where the users don’t all know each other, could damage integrity of cabal due to lack of social pressure. A few users could easily invalidate an item by dropping out or reducing pledges and thereby placing a greater burden on other members especially the cabal organizer.

**Security Model**

The security requirements are that:

— Only invited members of cabal can read or write suggestion, pledging, voting and member profile information. The existence of a cabal may be private or public.
— Members of a cabal can see only each others’ names, and not email addresses or other profile information. Suggestions and who made them are visible to all members; votes are visible, but not who made them; pledges are not visible except to the organizer.

Potential risks include:
— Hoax organizers who assemble a cabal to defraud its members.
— Dishonest members who refuse to pay after an item has been selected and paid for.
— Members who manipulate pledges to disrupt item selection (eg, by reducing pledges).
— Conflict of interest: members who direct the cabal to items they’re selling.
— Hackers who break into the system and extract profile information about users for identity theft.
— Hackers who insert themselves into a payment channel between members and organizer, perhaps just using this app for pretexting.
— Spam advertizers gain access and add suggestions of pharma, porn, etc.

**Threat model**
— Can assume no interest from state actors or criminal syndicates, since only minimal profile information stored (name and email).
— For small cabals, assume that all members know each other well, and communicate out-of-band, so little risk of fraud.
— For large cabals, assume that initiation and completion of the process are by out-of-band
communication using existing, trusted mechanisms (eg, class mailing lists), so little risk of fraud succeeding.
— Attempts to spam are very likely.

Mitigations
— Standard strategies to address code vulnerabilities (such as injection, XSRF, etc) and thus reduce risk of spamming.
— Attribute all suggestions in name to member, in order to expose members who leak credentials (eg, to spammers).
— Use access control to prevent even viewing of basic cabal information except to members.
— Make organizer responsible for due diligence on purchase, to ensure no conflict of interest or hoax.
— Prevent alterations of pledges, or allow only with organizer approval.
— Encourage comments as a means of informal authentication.

_User Interface_

[Not included]