

2 Conceptualization

2.1 Conceptual Model

The target system is a mobile specific carpooling application that uses any user's location sensitive information to help him/her achieve the aim of sharing a ride or getting a ride. The application has two modes of operation, interchangeable at any time: 'driver' and 'commuter'. This basically encompasses the whole target audience population at any time. The aim of a driver as represented in this application is to mainly socialize and gather people (friends/ friends of friends) while going for an activity (work or recreational). The objective of a commuter can be (1) to get a ride to go from a source place to a destination place or (2) to tag along an individual/ group for an activity.

If a driver wants to initiate an activity and grab friends to tag along, the system allows him to broadcast this at several level of privacy: (1) friends (2) friends of friends (3) School/ University Network or (4) publicly on the Network. The user can choose to input the destination/event/ time/ duration/ uniqueness and also tag others attending the event/activity. Commuters willing to join will have to send a request which can be explicitly accepted or anonymously rejected. If there is an acceptance, the system will provide tools to both the commuter and the driver to help tag along. The driver will be able to access the GPS location of the user and if he inputs his route details he can either reroute himself to pick the commuter up or ask the commuter to walk to a certain nearby location.

We provide a high level schematic diagram to represent the main components of the system, the nature of the user activities and the type of interaction happening among the users. Altogether we try to visualize the social problem space as in the Figure 2.1.

2.1.1 Key CMC Elements

When a first time user starts to use the application, he will have an option to leverage any social network into the system. The user's membership to one/ more of the existing social networks is used to help him start with a social network in the application. So the system gets a huge amount of data from the user's existing social network to potentially use in the carpooling scenario. The smartphone's GPS system is used to show the location of any member in this network. This allows users to plan instantaneous activities depending upon their friends' geographical positions and in turn helps crowdsourcing.

If a commuter wants a ride, he can first check the GPS locations of his friends on the screen. Then he can choose to ping a subset of those people around him about his intention of traveling to somewhere. If anybody is interested or headed to the same place, they might reply and further connections can be made. Or the commuter can, like the driver, share his riding intentions to friends/friends of friends/ publicly. If anybody replies, the system will help them to decide on the trip. The commuters can also mention other possible participants tagged along with them who would like to be considered by tagging them on the social network or just mentioning them. This will give the driver an opportunity to increase his social reach. Moreover, if the commuter does not have any friends as drivers in the Tag Along network at any particular moment, he can still either post requests or check his live feed to find if any posts by friends of friends or publicly available over the network interests him/her. After the commuter posts his ride need, he will also have the opportunity to get the filtered results from his affiliated network friends that tentatively matches his objective.

Now the rides can be short, long, regular or vacation trips. A user is supposed to categorize the trip into one of the categories while posting. The system will also allow adding customizations like incentives required, should agree to take turns driving, will like to split the gas etc. about the trips by the commuter/ driver. Also, the trips can be recurrently happening in either the driver's daily/weekly/monthly

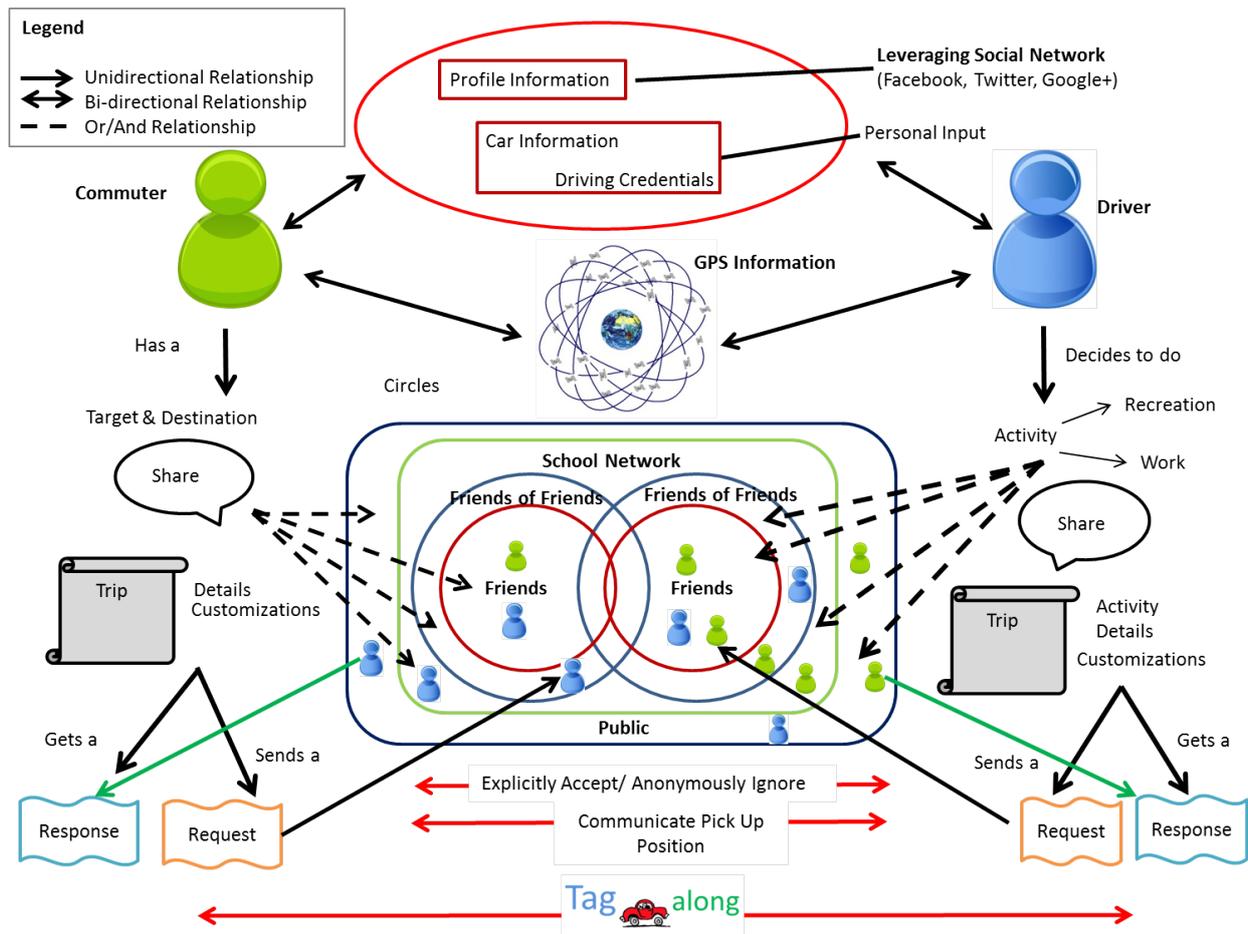


Figure 2.1: The Conceptual Model for Tag Along Application

routine or the commuters. So the users of this system will have the option to preserve their shared requests for ride sharing for future uses and the system will spawn the responses and show them to the user at higher command.

Apart from the profile information from the social networks linked with the Tag Along network, users will have an option to add in their car details, driving information details and will receive incentives in the form of badges. Higher tag-alongs will also be posted on the social networks at the user's discretion. Apart from leveraging the already available social network connections, users will also have the option to add people registered in the Tag Along network. This aims to overcome the limitations of the online social networks. So if a user does not have higher neighbor in the social network as their communication mostly happens face to face, he can still add him/her on the Tag Along network for getting a ride back home. An aspect of gameplay may also be introduced by providing badges to car-poolers to an important event with lots of people or the number of times they opted for car-pooling.

2.1.2 Requirements

Target audience: Our target audience is predominantly traditional students between ages 18-28 that may or may not have a car, live in small communities with other college students, and who would like to carpool for convenience, socialization, and safety.

Our secondary audiences are diverse individuals of students and professionals that need to carpool because they need transportation to work, school, want to be more economical, and/or want to be more environmentally sound citizens.

Requirement Analysis:

User Requirements:

- The user must have a Smart Phone.
- The user must have some experience with social media and mobile communication.
- The user must possess knowledge of downloading and installing application on mobile devices.
- The user must be willing to share basic information about his location and social network membership.
- The user as a commuter must be willing to ride with friends or friends of friends.
- The user as a driver must be willing to allow others to ride in his car.

Functional Requirements:

- The application will allow users to create their individual profile leveraging their existing social networks and communicate with individuals/groups based on location and shared destinations.
- It will update as soon as there are new rides/requests posted over the network. (real-time)
- It will show on a user's profile the live feed of activities, shared rides taking place among friends.
- It will allow users to connect with friends and friend of friends to Tag Along.
- It will allow users to send requests to one/more person(s) at the same time as well as communicate back responses.
- It will provide regulated access to requests, messages and user profiles.
- It will provide the user an option to create a customized circle (network) of friends for carpooling like "Preferred Friends" or "Recently Tagged Along".
- It will provide "Add as a friend" option based on a recently shared ride with somebody not already a friend.
- It will provide maps and route options to activity locations and pickups.
- It will allow, for a ride shared, posting on social networks or commenting on such a post.
- It will have personal privacy settings that will allow users to have the control in limiting their information visibility to individuals, whole networks, self-made networks, etc.
- It will be able to extract the GPS location of the user using the Smart Phone.
- It will have the ability to set recurring ride requests – every Friday, Monday – Friday, etc.
- It will have the ability for users to mention if they expect money for the ride or will split the cost of fuel etc. in the trip FAQ section of the request posted.
- The user as a commuter can enter his ride options and ask the system to search for available options from his affiliated networks.
- Tag Along in itself is also a social network. So, users will have the option to add people as friends by searching their name or entering their email address irrespective of having them on any other connected social networks.

Usability Requirements

- The application should be intuitive, easy to understand and easy for beginners.
- The application should provide efficient navigation for the user to access and browse through the content.
- The user should be able to create a profile on Tag Along easily and manage his account effortlessly.
- The task of adding friends and networks should be intuitive and pleasurable.
- The application features should be organized in a logical, consistent and intuitive way to enhance memorability.
- The application should use time stamps for real time updates of posts/ requests/locations to make them unambiguous and trustworthy.

Non-functional Requirements

- The application should preserve the last reported location of user if wireless signal is lost or in case of a battery failure.
- The application should give the user options to save his customizations in case he wants/needs to uninstall and reinstall the application later.

Negative Requirements:

- The application should not prohibit user from logging into multiple mobile platforms synchronously.

2.1.3 Components/Functionality

Metaphors and Analogies:

The application has two user modes—driver and commuter. Any user can use the application in only one of the exclusive modes at a certain time. The user in both modes can shout their ride intentions to a particular circle—friends/ friends of friends/ school network/ public. We assume that a driver will generally want to have company as an objective when he wants to share his riding intentions to an activity. And the activity can be work or leisure. The commuter has the main aim to get a ride. So he will have to shout his source and destination of his rides. His likelihood to land a ride increases by shouting this to people who are currently in close proximity of his target destination. So he will have an option to shout his ride intention to the following circles – Nearby Friends/ Friends/Friends of Friends/ school network / Public. It is to be noted that the broadcasting categories supported by the system are both one-to-all and one-to-one. So a user can ping any of his friends with a ride intention. To facilitate this aspect, the system will show the user his friends on a GPS map accessing the last accessible GPS stamp of the user with the associated time stamp. This is to be called *friend map*. The message that a driver or commuter shouts about any trip will have to have certain required features as well as a set of customizable features describing the trip called the trip FAQ. A *live feed* showing real time posts/ requests/ responses will also be provided to the users. After a connection between one/more commuter and a driver is made, i.e. both parties accept the ride share the system will provide a set of useful tools to complete the experience. If one of the parties does not belong to the other's friend circle, the system will (1) make the GPS location share-able; (2) ask to add the person as a friend in Tag Along as well as all/any of the connected social networks. After both the parties have shared their GPS locations, the driver can use the system to fetch a route that includes the commuter's current position or use a different route and ask the commuter to walk to a nearest pick up location. The system will

share a route between the commuter and driver, give options to both to edit it and lock it. Then finally the commuter gets a GPS trail to his pick up position while the driver gets a pick-up flag on his route to the event. After the ride share event, both the parties get a commuter and driver badge for the event/location and can allow a post of the ride share event on any of his connected social network.

Concepts, Objects and Operations:

The main concept for this system is ride sharing. The task domain objects created to make that happen are a ride request, a ride details message, a ride response and social circle. The social circle can be visualized in terms of current GPS positions, filtered in terms of groups of friends to show on the friend map and measure the distance in between or fetch a route. The request, ride details and response can be shared over the network to one/many people.

Relationship between Concepts:

The audience that can be reached by sharing of messages / requests depends upon the social circle of the user. The system is leveraging the user's social information to assist him share a ride.

Mapping:

The product is designed to support user drivers to have a better social outreach and user commuters to get a ride in need.

2.1.4 Key Scenarios

Scenario 1:



Figure 2.2

Raquel, age 18, rides a bus to go to school. The bus stop is 4 blocks east to the school. She also works at a local restaurant, where she is learning to be a chef, about 3 blocks away and while returning back home waits at the bus stop over an hour for the bus. It is Monday morning and Raquel has half an hour before the scheduled bus leaves. She logs into the Tag Along app and looks onto the friend map to see if any of her driver friends are nearby her house. She has both her Google+ and Facebook account connected to Tag Along. She finds Tom, a colleague from the restaurant, nearby at a car shop. She pings him a request for a ride with her original and destination mentioned

and the time by which she needs to be at school. Tom replies that he can pick her up an hour after. Raquel calculates and notes that it would be enough to reach school in time. She accepts the response. Tom sends her the route and decides the bus-stop as the pick-up point. She gets some extra time for her homework. While riding with Tom, she posts her intention to share a ride back from the restaurant she works in, to home. She makes this available to her friends of friends. As Tom drops her off, she thanks him and allows Tag Along to post her ride share on her Facebook status. During her lunch she gets a response from one of Tom's friend Lisa. It happens she is taking a late class in the same school and rides back home on the same street 10 minutes after Raquel is done in the restaurant. So Lisa responded with her time frame. Though Lisa dropped her one block away to avoid detouring, Raquel was back at home around 9:15pm instead of 10:15 pm. She sets Tag Along to remember these three trips for Monday, Wednesday and Friday and post them in the night before. She also adds Lisa on Facebook and finds Tom commenting on her status showing "Lisa and Raquel rode from downtown Indianapolis to the West Side".

Scenario 2:



Figure 2.3

Andrew is a nerd and a senior at Tristate Technical University. He works hard all week attending classes, studying and completing assignments and has often not planned activities at the weekends. He has a social network but is often busy to check ongoing events and plan accordingly. He has a car and it being a Saturday night he would love to go to a movie.

Bored from the regular status updates in Facebook, he turns on the Tag Along app on his smartphone. He chooses him as a driver. Instead of posting his intention of going to a movie, as he is basically a shy person, he hovers over the feed of activity going on by his friends. He finds Stella, a classmate, has just been tagged along by Rob for the same movie he was planning to go. He comments on the post also broadcasting to his friends that he is driving to the same movie. Stella comments on the same feed asking if he can pick up her friend Jonah and tags her on the post. Andrew updates his broadcast to friends of friends and also sends Jonah a request for sharing a ride to the activity. Jonah sends him a friend request on Tag Along and skims through his Facebook profile when friended. Then she responds sharing her GPS location and also tags Tim as a commuter to be on the trip. Andrew checks the route options, decides on one and sends to Jonah. She accepts. Tim sends Andrew a friend request on Tag Along and the whole group gets ready to rock the Saturday night.

Scenario 3:



Figure 2.4

Ben, 29, is a teacher at a career college in Indianapolis. He drives his own car from his home in Broad Ripple, a local art district, 20 minutes away from work. He is a social person. On a Sunday morning, during a brief encounter with a neighbor at the church community, he came to know that she has to wait for a bus on the way back home from school. Her school happens to be on the same street that Ben drives home from work. So he asked her to add him on Tag Along and ping him when she is coming home. If he is also coming back the same time he can give her a ride. Ben got a friend request on Tag Along from Emma, his neighbor, the next day and added her in the neighbor

circle. She pinged him on Tuesday while returning home and they shared a ride. While taking, they discovered there was a small jazz festival happening next Friday at Broad Ripple and a lot of people would attend that if managed to get a ride. After coming back home, Ben broadcasted the activity and his intention to share rides to public on Tag Along. He also tagged a few friends who he knew were drivers and would enjoy this festival in his post asking them if they were willing to carpool. The Friday event was a successful gathering with all the drivers getting a drive-to-swarm badge and the commuters getting a tagged-to-swarm badge on Tag Along.