HomeTurf

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I. Problem Space

A. Purpose: Product Market

Home Turf is a mobile app concept built around the idea of "community notice boards" that allow people to connect with each other within a confined local community. Users in the Home Turf system will be able to request for shared rides, share buy / sell / giveaway notices, ask for help or information with other community members or neighbors in any of the following premises: college dorm, workplace, apartment complex. Like in real world, users can choose to remain largely anonymous and participate in instant communication with neighbors until there is a mutual exchange of personal details.

B. Goals: Usability and Experience

The system aims to provide the following user experience goals:

- **Local**: Confine communication within users in a specific locality, determined by geo-location mapping and radius calculations. For example, user can center on 535 W Michigan Ave and select relevant locality as one of the following: IUPUI School of Informatics & Computing, IUPUI Campus or Indianapolis Upper Canal Area.
- **Anonymous**: Users can choose to remain largely anonymous, with a limited shared profile, until there is a mutual exchange of personal details through the Home Turf system. The limited profile is to allow relevance matching by the system for establishing communication links within the network. Shared profiles include User ID, Home Turf locality, sex, age group, field of specialization, owns a car, interest tags.
- **Instant Communication**: The mobile app will include instant messaging features to facilitate real time communication where relevance is established, or a response is posted. For example, when a shared ride request is posted, users within the same locality that own a car will receive instant notification with an option to start communication.

C. Problem Space

In the old days people used community boards – large pin-up boards placed in the lobby, stairwell or any common place of the community. The boards would

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hold for sale ads, notice of lost cat, request for assistance or just general messages to share with fellow community members. The drawbacks of such notice boards are that they would require someone to be physically present in front of it to see the message, and the messages may not be applicable to all who read them.

In the age of online communication there are tools to help discover local information, user reviews and also connect with people living in the same locality. Some existing solutions offered within the problem space and their limitations are mentioned below:

- **Foursquare**: Local events, places and user reviews. Does not allow social interaction with users in the locality.

- **Ridejoy**: Connecting people in a locality to for ride sharing. Limited to sharing rides, no option for social networking or reaching the local community.

- **Nextdoor**: Neighborhood social network, allows messaging and information exchange within a local community, but limited to communication posted on site. There is no option for direct and real time communication or anonymous participation. Static and manually configured group with fixed members.

- **i-Neighbors**: Neighborhood community platform to set up closed groups, exchange media, post messages, polls or questions within a local community. Static and manually configured group with fixed members.

- **ChaCha**: is a human-guided search engine. It provides free, real-time answers to any question, through its website, via text messaging, or by using one of the company's mobile apps. ChaCha answers questions through the use of independent contractors called Guides. There are four main types of guides: Generalist/Specialist, Expeditor, Transcriber, and Vetter.

HomeTurf is different from these existing solutions in the sense that it bundles a variety of user needs into one neat package and offers social collaboration through anonymity and/or user controlled information sharing. HomeTurf facilitates communication within a specific hyper local community area as narrow as one's apartment and even at a broader level as wide as a whole city. The ability to reach a target user group within a highly confined or broad geographic area through a dynamic and unique user interface, sets HomeTurf apart from the competition.

II. Design Conceptualization

A. Usability Study Findings

1. Key CMC Elements

Contexts of Use:

Someone losing a notebook at the workplace can reach out to other people working at the same location, "Please let me know if you find my blue notebook I may have lost somewhere in the building". Turf set as within the building.

A student living in a dorm can post a wanted ad, "Interested to buy a couch if anyone selling in the building or within walking distance". Turf set as within campus area.

Visitor in a new neighborhood can ask the local community for directions, "I'm new in town. Is there any pharmacy within walking distance?" Turf set as within the neighborhood.
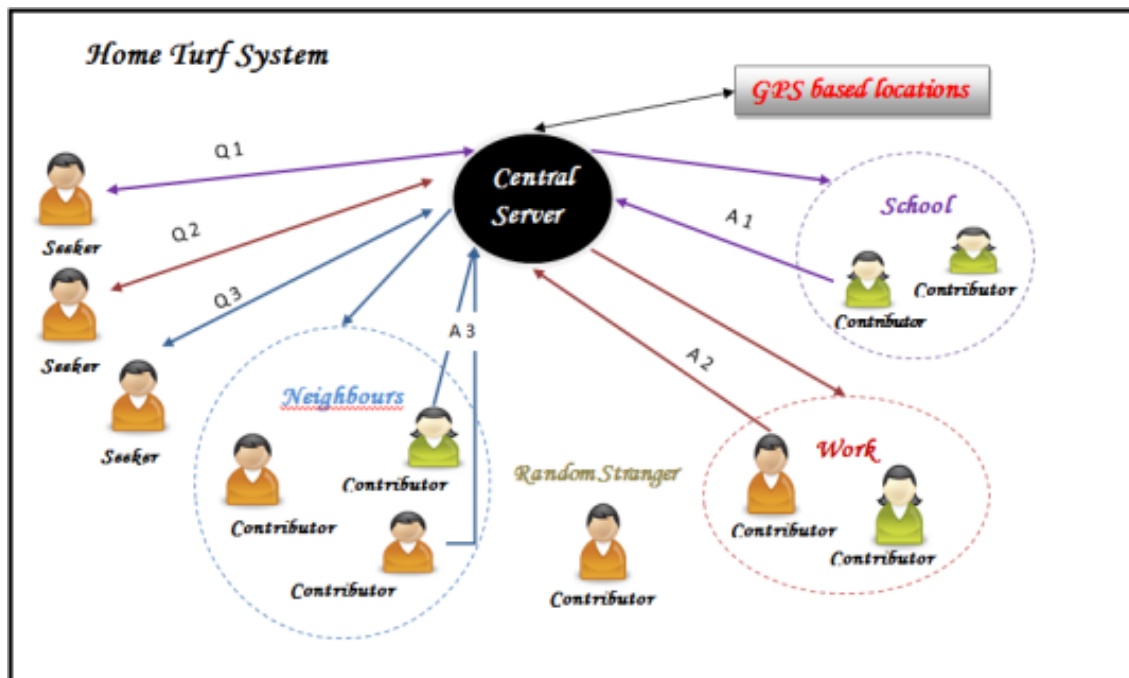
Key Features:

Home Turf combines the requirements of a local community within a social network of instant communication.

- There is no fixed or defined network with fixed user group. Home Turf operates as a global social network where each communication is restricted within users belonging to a chosen locality, i.e., "turf"

- With each post system sets perimeter based on GPS data or user input and suggests choices to restrict within a certain establishment, neighborhood or area.
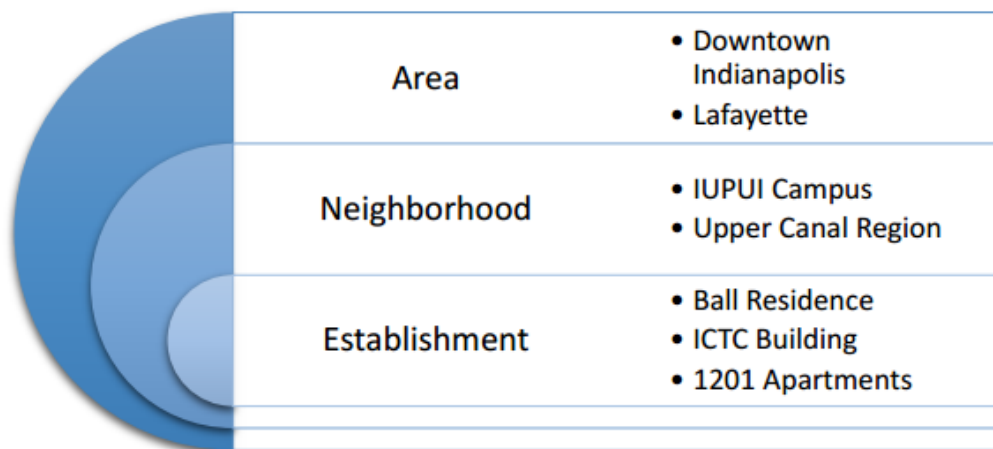
- All users of Home Turf can choose to remain anonymous with only a few personally unidentifiable profile information shared on the network. Personal information can be disclosed between selected users on mutual consent through the system.

- Mobile app supports instant notification of relevant posts or responses within the Home Turf community allowing user to respond with direct instant messaging.

Nature of Users:

The users of the system can be categorized in both roles and demography. Following 2 roles are interchangeable for same user depending on the context:

- *Seeker:* User posting on Home Turf seeking a solution, e.g., looking for a lost cat, need a ride, asking direction to a nearby pharmacy.

- *Contributor:* User voluntarily responding to a query or post providing solution, either by means of an offline response or instant message.
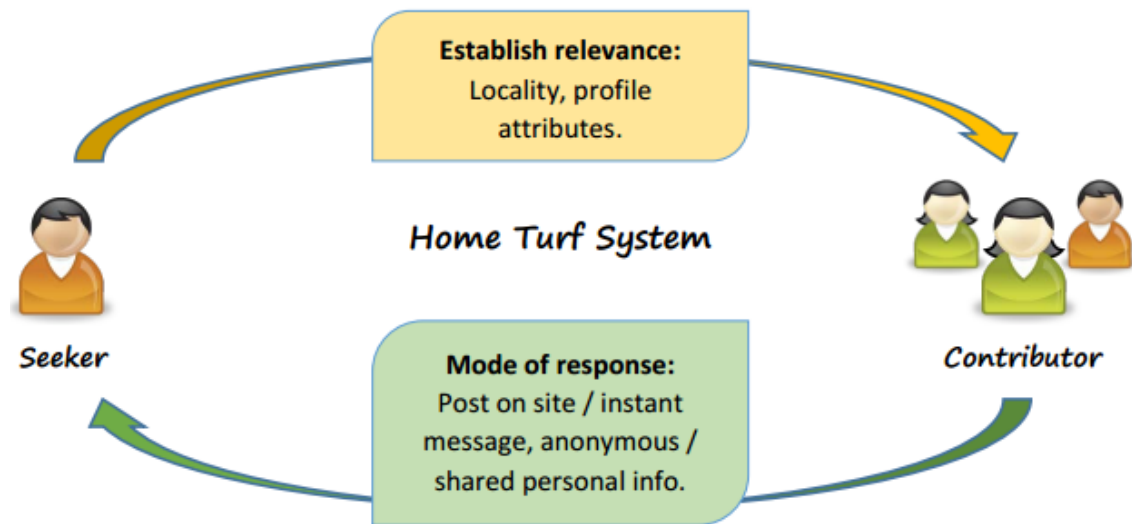
By demographic distribution, users of the system may be anyone belonging to a community:

- Students living on-campus
- Professionals in a workplace
- Residents of a housing complex or apartment block

Functional dimensions:

The Home Turf mobile app is a social communication tool that can specifically channel communication to location relevance determined from user preference and profile information.

- Seekers
- Contributors

- *Anonymity*

- Marketplace: Buy, sell, giveaway
- Shared Ride
- Request help & info

People **Topic**

Interaction **Location**

- Noticeboard posts
- Instant messaging

- *Mobile*

- Bound perimeter by radius - *locality*
- Narrow by establishment, neghborhood, area
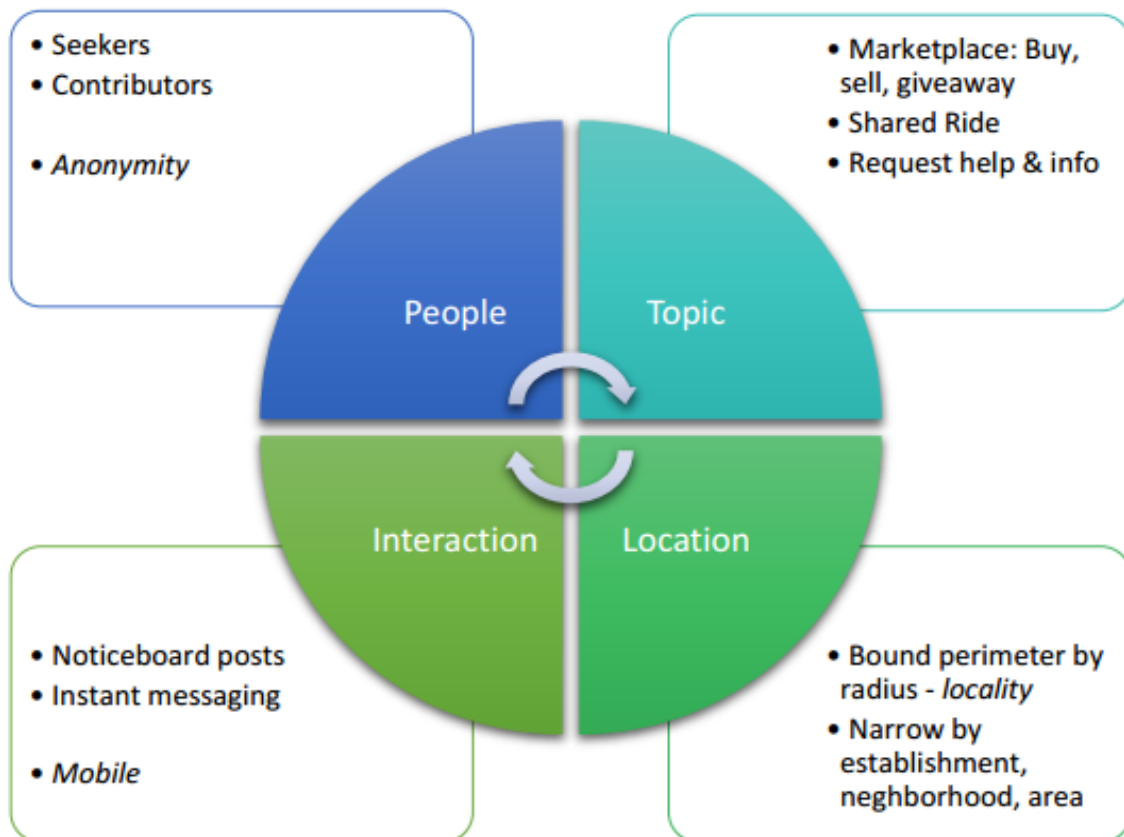
2. Requirements: Components / Functionality

User Requirements:

- Runs as a background process depending on user's configuration settings or can be switched on when required.
- Typically only consumes very few kilobytes for textual data and few Megabytes in case of image sharing.
- Maintain user preferences and personal details securely. Details will only be shared upon user discretion.
- Notification settings and frequency can be configured by user.
- Display questions to users based on user tags and question-and-answer history.

Functional Requirements:

- Wireless Internet Connectivity
- Supported platforms include Android, iOS and BlackBerry
- Seamless connectivity with central server
- Support for Global Positioning System (GPS)
- QWERTY keyboard is recommended

Usability Requirements:

- Simple, intuitive interface with minimum and gradual learning curve.
- App interface triggers when user selects it from the app-drawer or notifications pane.
- Accurate turf matching based on current/selected position and precise selection of users available in selected turf parameters (location, radius etc.)
- Demographic data browsing capability
- Appropriate visual cues and feedback in form of prompt messages display, helper functions, documents within online user manual etc.

Technical Specifications:

The app is intended to work on the popular mobile platforms such as Android, iOS and BlackBerry OS. The phone is required to support connectivity through Wi-Fi and 2G/3G/HSPA/LTE+. The phone must also support an active GPS to determine the current location of the user. Questions previously asked can always be viewed in offline mode but to receive new questions and ask a question or to answer a question, an active internet connection is needed. The app itself will only consume a few megabytes of data within the storage space of the cell and will only cache essential data within the storage. Messages are exchanged between the central "Home Turf" server and the user's device using a synchronous SMTP protocol.

3. Key User Scenarios

User Scenario 1: Doug, Male, 45 years, Working Professional

Doug works at a reputed firm based at Lafayette road, Indianapolis. He drives down to work every day but one day, his car is rendered useless due to a flat tire and the absence of a spare one, lack of time and the infrequent public transport system puts him in a difficult situation. Without further delay, he takes out his mobile phone and uses Home Turf to broadcast a message within the turf of his apartment, asking for a ride if someone is headed on the same route. Doug doesn't know the others in the building very well and to his surprise, someone replies to his query within a few moments, asking him to share his phone number and name. Doug does so and is offered a ride to office by Mike. Not only did Home Turf enable him to make it to his office on time, Doug now car pools with Mike on most days and both save a lot on fuel by sharing the costs, thanks to nearby workplaces and similar work schedules and Home Turf.

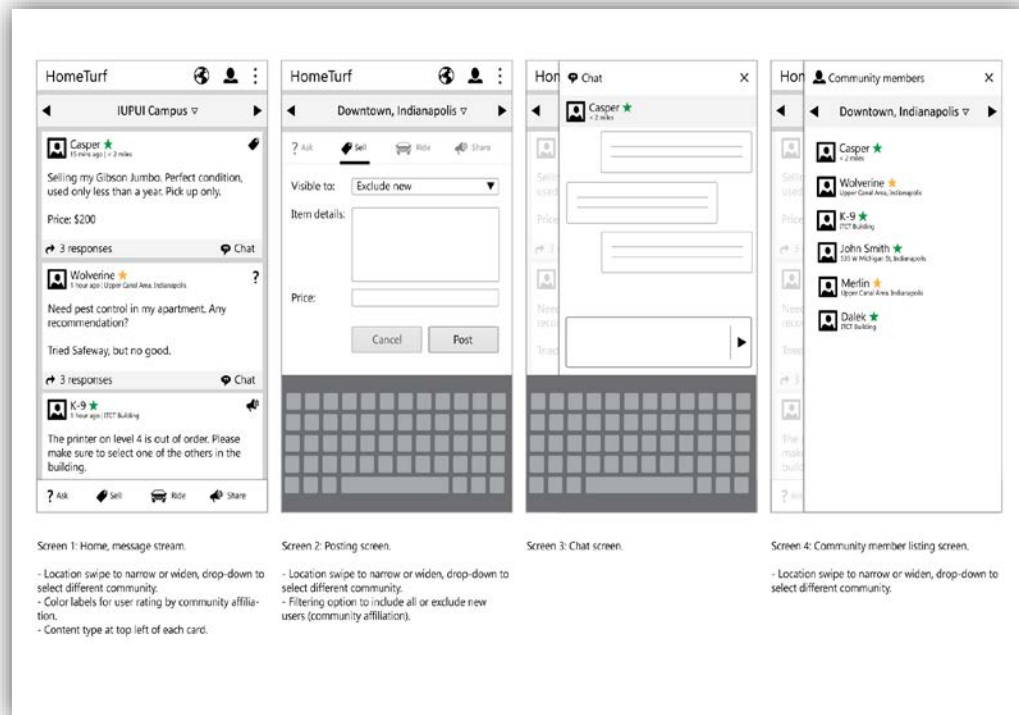## User Scenario 2: Malaika, Female, 25 years, International Graduate Student

Malaika is nearly set to fly to the USA to pursue her higher education in a reputed university. One of her major concerns right now is finding the most suitable residence for accommodation. She has been through countless apartment websites and is unable to make out the pros and cons of different apartments because the website and most forums speak well of the places and the reviews may not be totally trustworthy. She decides to use Home Turf and by choosing her turf to one of the apartment accommodations at a time, she is able to post her queries directly to people actually living in these areas and get honest reviews. This not only helps her find the right apartment but has also helped her find potential roommates.
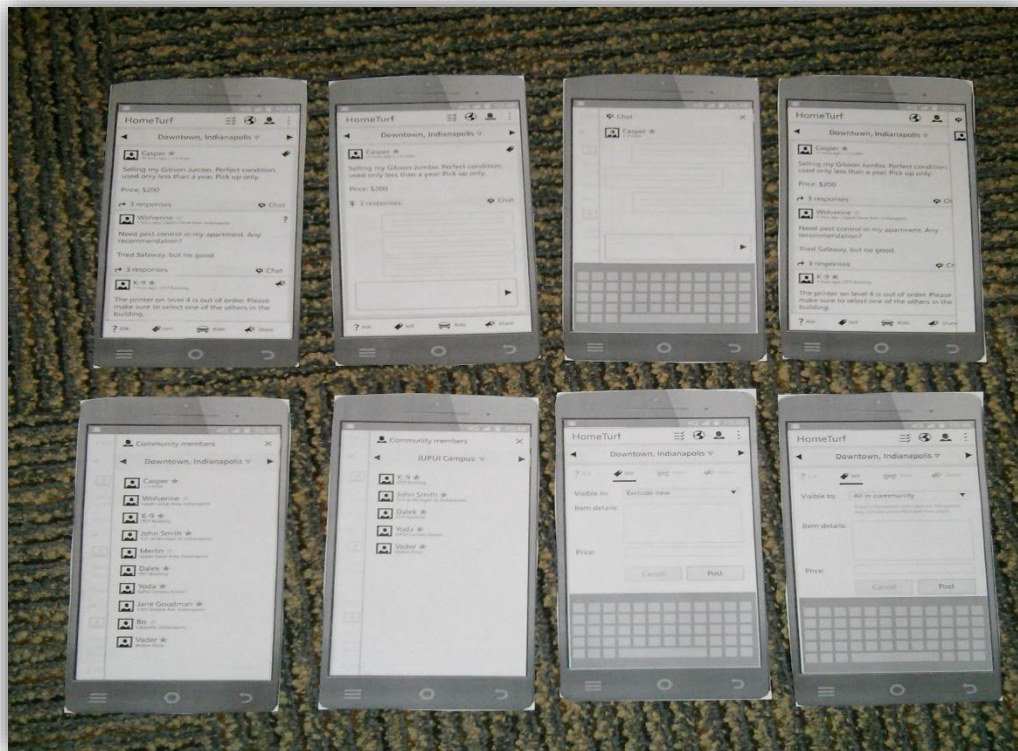
User Scenario 3: Karl, Male, 34 years, Working Professional

Karl has been recently promoted and transferred to his firm's New York based headquarters. He loves his new office but due to the bulk of responsibilities he must address to, he is unable to explore and learn much about the area around the office building in the first few weeks. He doesn't really enjoy the cafeteria food much and is soon in need for a change. Owing to lack of knowledge about good eateries nearby and finding similar reviews for all places over the internet, he instead turns to Home Turf and puts his query for a good Chinese restaurant across his colleagues. Some of the food enthusiasts within the company immediately guide him to some good restaurants from personal experience and that they feel suits his needs. Karl is thankful as he is able to learn more about the neighboring area much more quickly thanks to Home Turf and in turn, is able to post his reviews and recommendations for some of the lesser known food-joints as well, thus, returning the favor and helping everyone.

B. Prototype Design & Development

1. Paper Prototype:

Screen 1: Home, message stream.

- Location swipe to narrow or widen, drop-down to select different community.
- Color labels for user rating by community affiliation.
- Content type at top left of each card.

Screen 2: Posting screen.

- Location swipe to narrow or widen, drop-down to select different community.
- Filtering option to include all or exclude new users (community affiliation).

Screen 3: Chat screen.

Screen 4: Community member listing screen.

- Location swipe to narrow or widen, drop-down to select different community.

2. Cognitive Walkthrough:

- Sign up form should use bounded text-boxes instead of underlines. Just lines do not convey that the field is editable.
- The color of the star indicates reputation level but this was unclear to the user. The stars were not clickable. Recommended change could be making the star clickable and once clicked, a pop up window would display the reputation level associated with that color of the star (for example, Green: Reliable).
- User did not understand that the chat panel could be swiped right to collapse it. An arrow or other visual cue should be used to suggest the same.
- The community members' icon was confused for the "profile icon". The icon should either be changed (replace with multi-user icon) or be accompanied by a label.

3. Dynamic Prototype:

The Hi-Fi Prototype was developed in the form of an android app using the latest Android SDK (Software Development Kit, API-21) and Eclipse (programming editor for java and android development). The prototype was targeted for Nexus 4 but works well for android smartphones with a screen size of approximately 4.7"-5". The Android OS supported is 4.0 or higher (Ice Cream Sandwich and above).

Some snapshots of the high fidelity prototype have been shown below. More snapshots have been included within the Appendix.
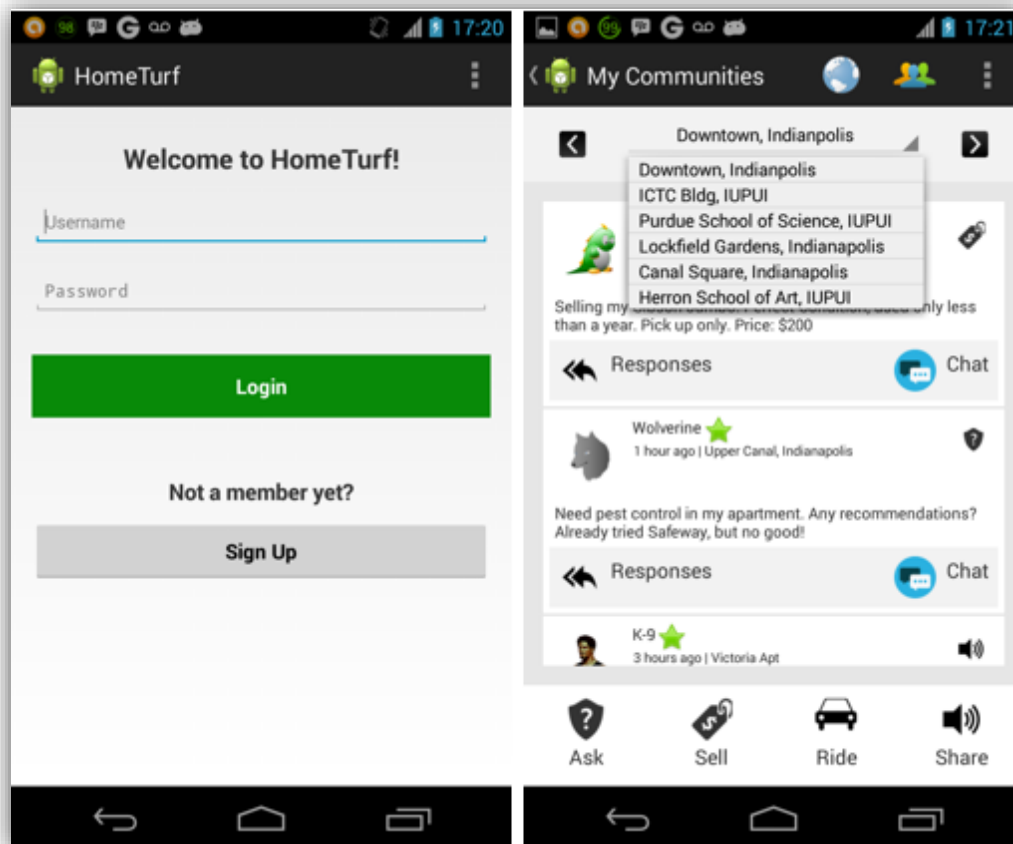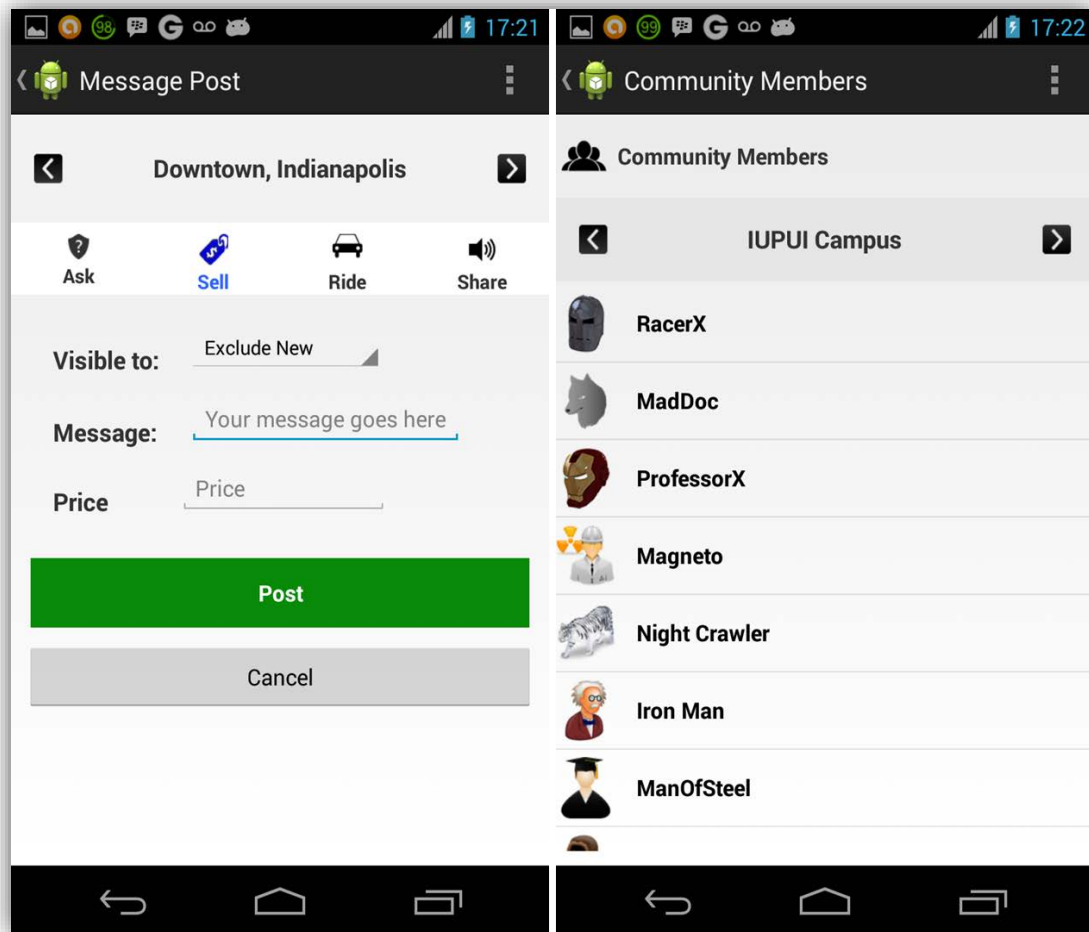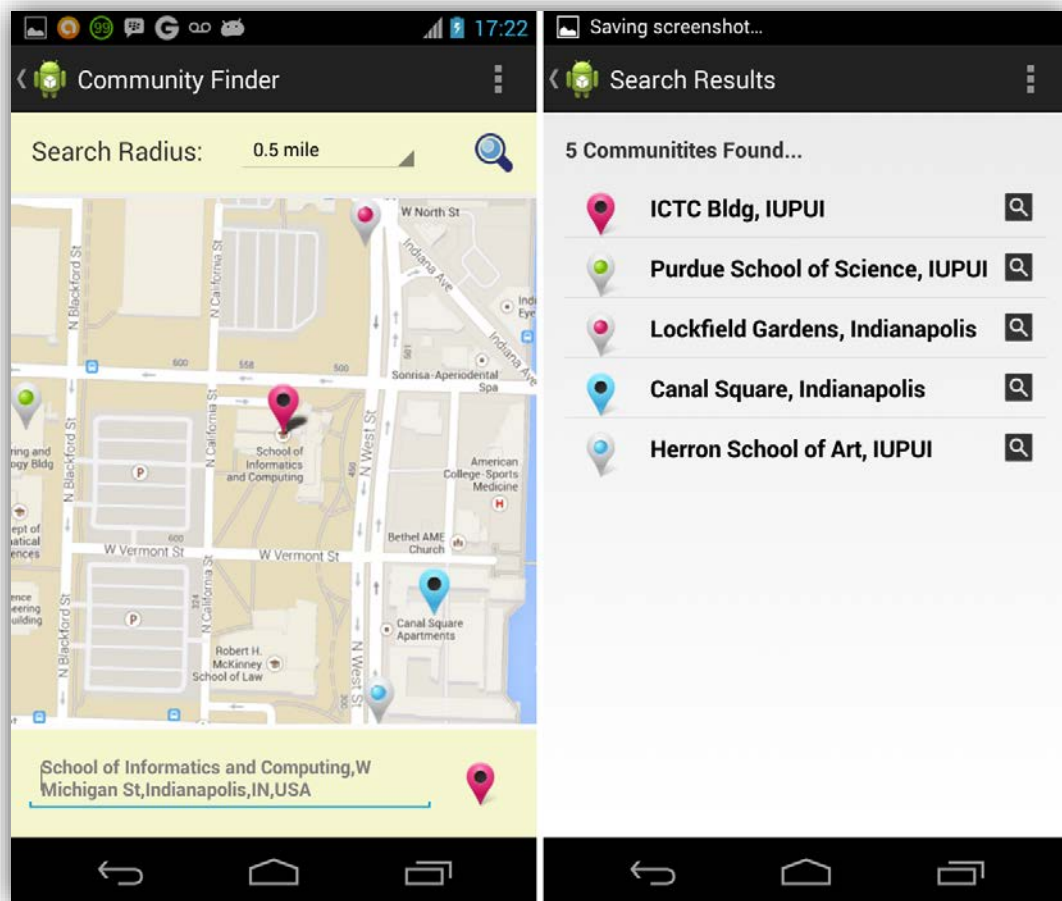
III. Validation

A. Usability Study Findings

1. Task Error

As a part of the expert evaluation, evaluators were given a set of task-based scenarios and log errors found (Scenarios and error definition: https://docs.google.com/a/umail.iu.edu/document/d/1ib7vTc3n1PwTtQqERg4fun YIR6uqGwM9rZl1UE6hxD0/edit).

Summary of the errors logged by evaluators are given below:
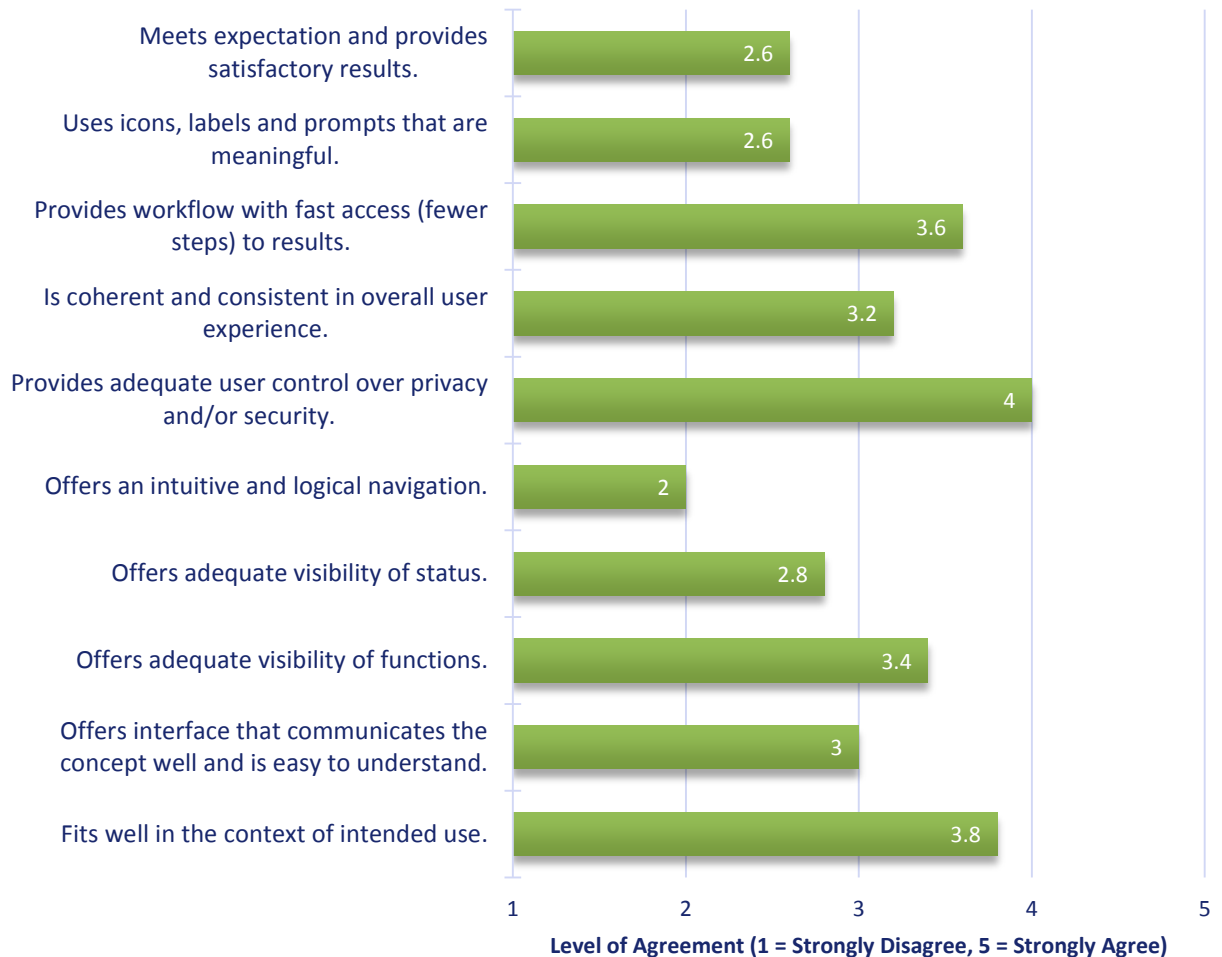
- Unclear labels on sign up form: Avatar, Email ID, Submit

- Status unclear: it is not well understood which community is currently on display. The 2 top bars appear as a hierarchy of navigation but probably functions independently, which is unexpected and confusing.

- Ambiguity in navigation structure: Difficulty understanding how the granularity of communities change and how to switch to different communities.

- Icons not understood: community maps represented as a globe, announcement as speaker, filtering options as checklist sheet.

- Difficulty finding list of other communities: globe icon opens map but it is not intuitive on how to view listing. Some tips or clear indication may be required.

- Expected functionality missing: clicking on a post does not expand to display details. "Responses" and "Chat" labels are not clickable - only icons are too small for tapping for the actions.

2. Post-Task Questionnaire

10 questions related to user experience were presented to each evaluator as a questionnaire to collect level of agreement.

Averaged results are given below:

Expert Review Feedback (Average)

Question	Average
Meets expectation and provides satisfactory results.	2.6
Uses icons, labels and prompts that are meaningful.	2.6
Provides workflow with fast access (fewer steps) to results.	3.6
Is coherent and consistent in overall user experience.	3.2
Provides adequate user control over privacy and/or security.	4
Offers an intuitive and logical navigation.	2
Offers adequate visibility of status.	2.8
Offers adequate visibility of functions.	3.4
Offers interface that communicates the concept well and is easy to understand.	3
Fits well in the context of intended use.	3.8

Level of Agreement (1 = Strongly Disagree, 5 = Strongly Agree)

3. Interview

At the end of the evaluation, evaluators were interviewed with open ended questions related to the tested product. A summary of responses are given below:

Q: How clearly do you feel the concept of the product was communicated to the user? What was lacking, if anything?

- The idea of "communities" might be confusing to users and how it is expanded to include larger geographical area to include multiple small communities. It is fine to have several small communities that are mutually exclusive of each other, but expanding boundaries causes confusion because of overlaps and possibility of one community including multiple communities under it. Perhaps the term "community" can be used for the originally joined group and expanded area could be called something else - to differentiate between the entities. Or it can be made visible to the users the actual coverage of what they are seeing - ie, listing all the communities included in the larger scope.
- The function of "Chat" may mean it can only be used when users are online. Since it works also as the only private messaging system, it can be conveyed differently to clarify more on its unique capability differentiating from a reply in post thread.

Q: Please elaborate on any issues of visibility and feedback to the user you may have noticed.

- Ownership is missing from the interface. Users may feel more comfortable to know that they are viewing content organised specifically for them and they are on their "own" page. The proper placement of user identity could be with the posting features which they use to ask, sell etc.
- When users expand their communication beyond the joined community, it may help to provide feedback on what other original communities are included. This applies especially to the new post page.
- Users trustworthiness could also include endorsements, e.g., members endorsed by more other members can reflect on their trustworthiness and it should be made visible.

Q: Did you feel there was any problem with the use of interface elements?

- Semiotics / representation through icons should follow popular conventions. The globe icon (used for map) has been popularized by Facebook to mean "notifications" and may be misinterpreted. Question mark usually represents "help".
- User rating is not well represented through different colored star symbols.

Q: Did you feel the features of the product were adequate? Does it meet expectation of users?

- It is very important to provide a way for users to bookmark posts for later review or action. For announcements and for sale posts users generally like to mark important ones to revisit later as reminder.
- In social computing, the role of new users is very important to the success of an application. The importance of encouraging new users outweighs security concerns and therefore it should not be an option to "exclude new users" from any communication.

B. Summary of Product Assessment

1. Problems with the Product

Following the expert evaluation results, existing problems with the initial version of Home Turf is outlined below:

User experience issues

- The idea of "communities" might be confusing to users and how it is expanded to include larger geographical area
- Black "Action Bar" was easily missed. Hence, some important functionality was ignored.
- Semiotics / representation through icons can be misleading and should follow popular conventions.
- Difference between people with real information or anonymous alias in members' list is not obvious.
- Public (profile) information with the real personal information during sign up should be clearly separated.

Feature requests

- It is very important to provide a way for users to bookmark posts for later review or action.
- Ownership is missing from the interface. Users may feel more comfortable to know that they are viewing content organized specifically for them and they are on their "own" page.
- Instant messaging with known contacts visible within the contact list. Visibility of availability status (online/offline) for each member.

2. Recommendations for Future Development

Clearer communication of concept and logical navigation

- Introduce custom name for each joined community such as, "Home", "School", "Work" etc.
- Visually represent a community as browsable breakdown of multiple granularities.
- Provide affordance of zooming in and zooming out with "+" and "-" symbols.
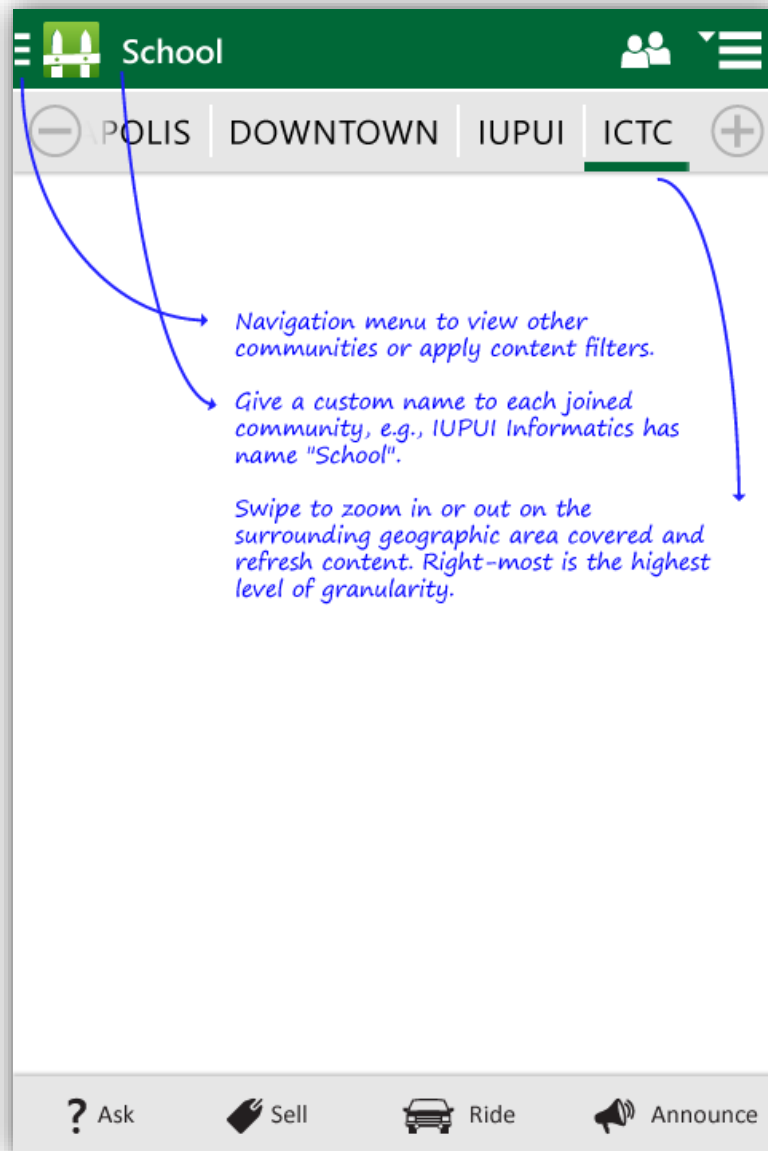
- Introduce navigation drawer to organize list of communities and content filtering options, thereby removing clutter and confusion from the action bar.
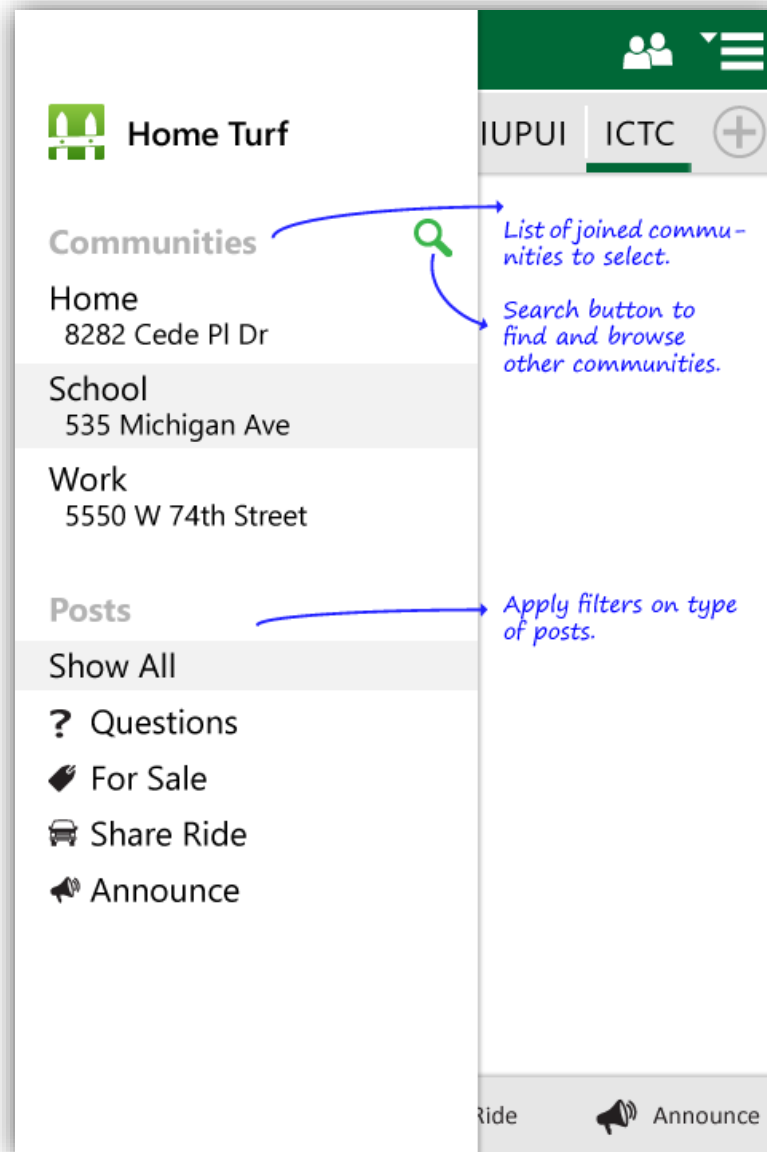
Representational interface elements

- Review icons and labels to maintain consistency and standards.
- Provide better visual distinction between main screen and overlay screens such as chat, member list etc.
- Increase size buttons and links to include text labels and provide visual "clickable" affordance.

People and community relevance

- In community members' list, highlight and group "Members you may know" with real profiles and enabled messaging options.
- Reduce to only 1 category of star for new users in the community, and an "endorsement badge" icon to identify most endorsed members.

Feature addition

- Bookmark or "Save for later" function for posts that users can mark for later review or follow up.

IV. Appendix

A. Initial Product Abstract

Home Turf is a social networking tool to facilitate information exchange between members of neighborhood communities, e.g., workplaces, dorms, schools, apartment blocks etc.

Membership and user profiles:

- Users must register on Home Turf by creating a full profile with verified cell phone and email address.
- Other members only see a personally non-identifiable alias or username, unless in member's phonebook, throughout all communication and activity within the application. However, user may choose to share personal details with another member when required.

**Communities and reach of communication:**

- To access communication within a community, each user requires an invitation (new or as response to a request) by an existing member for introduction. User may join multiple such communities.
- For communities joined, users can choose to restrict communication within the specific community or expand the location scope around the community up to city-level areas. For example, member of IUPUI community can communicate within only IUPUI, Downtown Indianapolis or Indianapolis city.

Features and scope of content:

- Within a selected community (and chosen reach) users can post content of the following types: **1) Ask** - general inquiry seeking help with local knowledge, **2) Sell** - list an item for sale, **3) Ride** - Post a request to share a ride, **4) Share** - share an important information or tip for other community members. User's may also choose to include all members or exclude new members from viewing.
- System can use GPS to determine current position and load corresponding joined community in the app, which may be changed by the user.
- User may search for other communities, view members' list and request invitation from known users (revealed by matched details on phonebook) to join. Users may also create new communities and send invitations to join.

- New posts from other members are posted on community home page with member's alias, approximate origin location, time and type label (ask, sell, ride or share).
- Responses to user's posts and occasional new posts (by relevance) from other members generate app notifications.
- Responses to posts may be done through replies (others can see as a thread), or instant chat (private one-on-one dialogue) through the app.
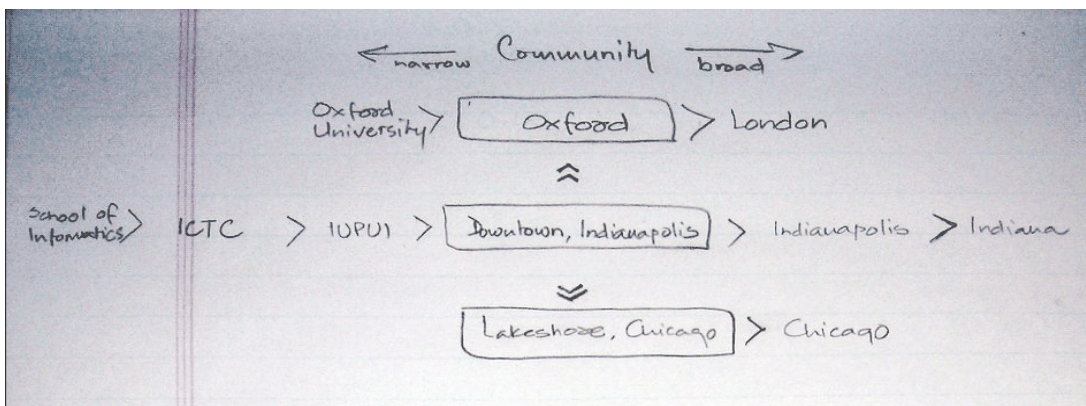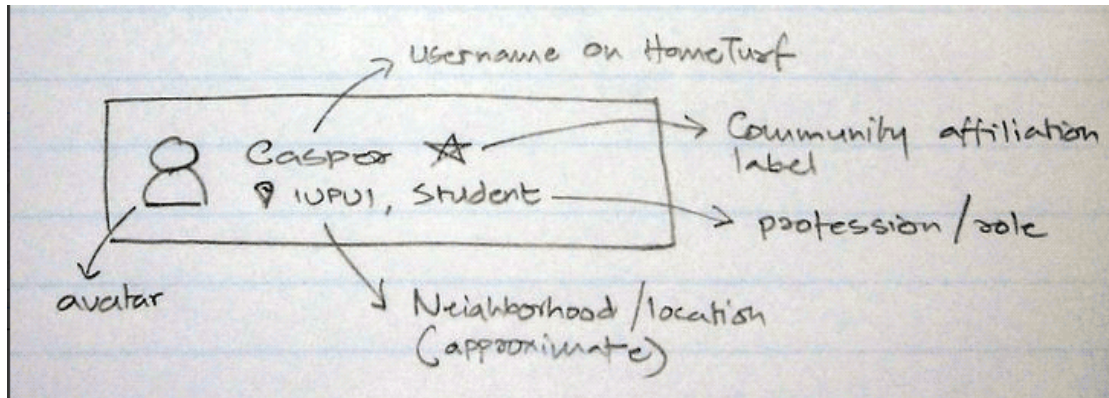
B. Paper Prototype Sketches
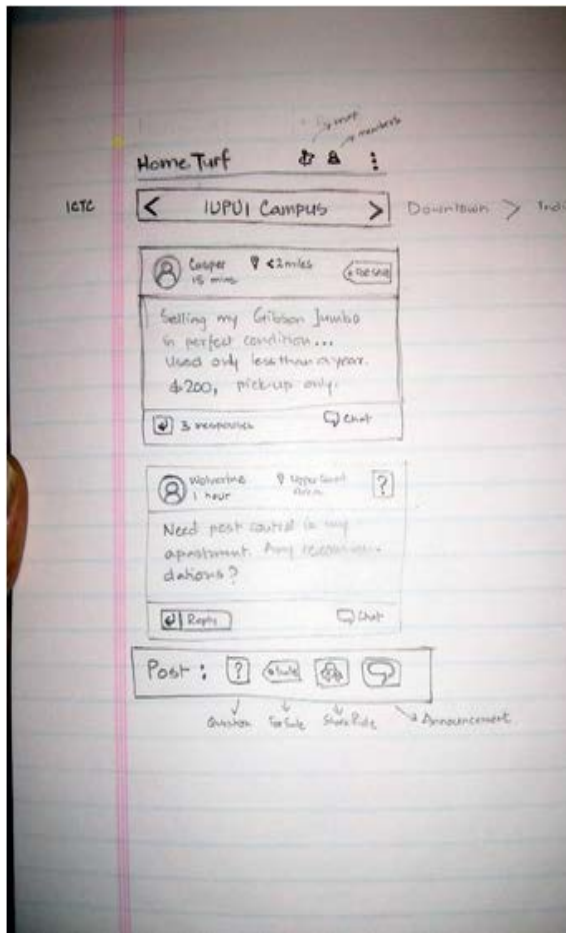
- titlebar, buttons: map, people / members (to view list or invite)
- surrounding locality: narrower toward left, wider toward right - we may need a link / button to input different community.

- the posts from others in the locality, displays: username, post time, approx location, type of post, reply, number of responses (to expand on click), option to start chat (available if user is online)

- post bar: can expand to show input area below when post type selected.

Username on HomeTurf

Community affiliation label

profession/role

Caspar ☆

IUPUI, Student

avatar

Neighborhood/location (approximate)

C. Internal Walkthrough TaskSheet

TASK NO.	TASK DESCRIPTION
1	Register yourself on Home Turf.
2	You are part of the Downtown, Indianapolis community. Describe what you see and what information you think is conveyed on the community page.
3	Investigate further details for the first notification on the page. Who is it from? What additional information has been added by other members?
4	Engage yourself in a one-on-one conversation with the first Seeker.
5	Does the Community page indicate current ongoing conversations? If so, how would you check them out?
6	Find out who are members of the community "Downtown, Indianapolis".
7	Switch the community page to "IUPUI" community.

D. Usability Test Results

Task Errors

- Task based scenarios:
  https://docs.google.com/a/umail.iu.edu/document/d/1ib7vTc3n1PwTtQqERg4funYIR6uqGwM9rZl1UE6hxD0/edit#bookmark=id.8b2hhsllfoxt
- Task error records:
  https://docs.google.com/spreadsheet/ccc?key=0ArWXfbcELjT5dGhQcDNFbDhQMGloTExtSWVCOUlCSUE&usp=sharing

Questionnaire

- Review questions:
  https://docs.google.com/forms/d/1txKDJHrvqzO73B-MaoSXaJmcqRd5qn3f_iAGWiWePoM/viewform
- Review responses:
  https://docs.google.com/spreadsheet/ccc?key=0ArWXfbcELjT5dHJDb0c2Rkh6S183ZlRWMkJGeVdma2c&usp=sharing

E. Test Subject Profile Information

Expert User 1: pursuing PhD program in HCI at IUPUI

Expert User 2: pursuing Master's program in HCI at IUPUI

Expert User 3: Assistant Professor at IUPUI

Expert User 4: pursuing graduate program in HCI at IUPUI

Expert User 5: pursuing Master's program in HCI at IUPUI

F. Additional Screen Images of Product Interfaces
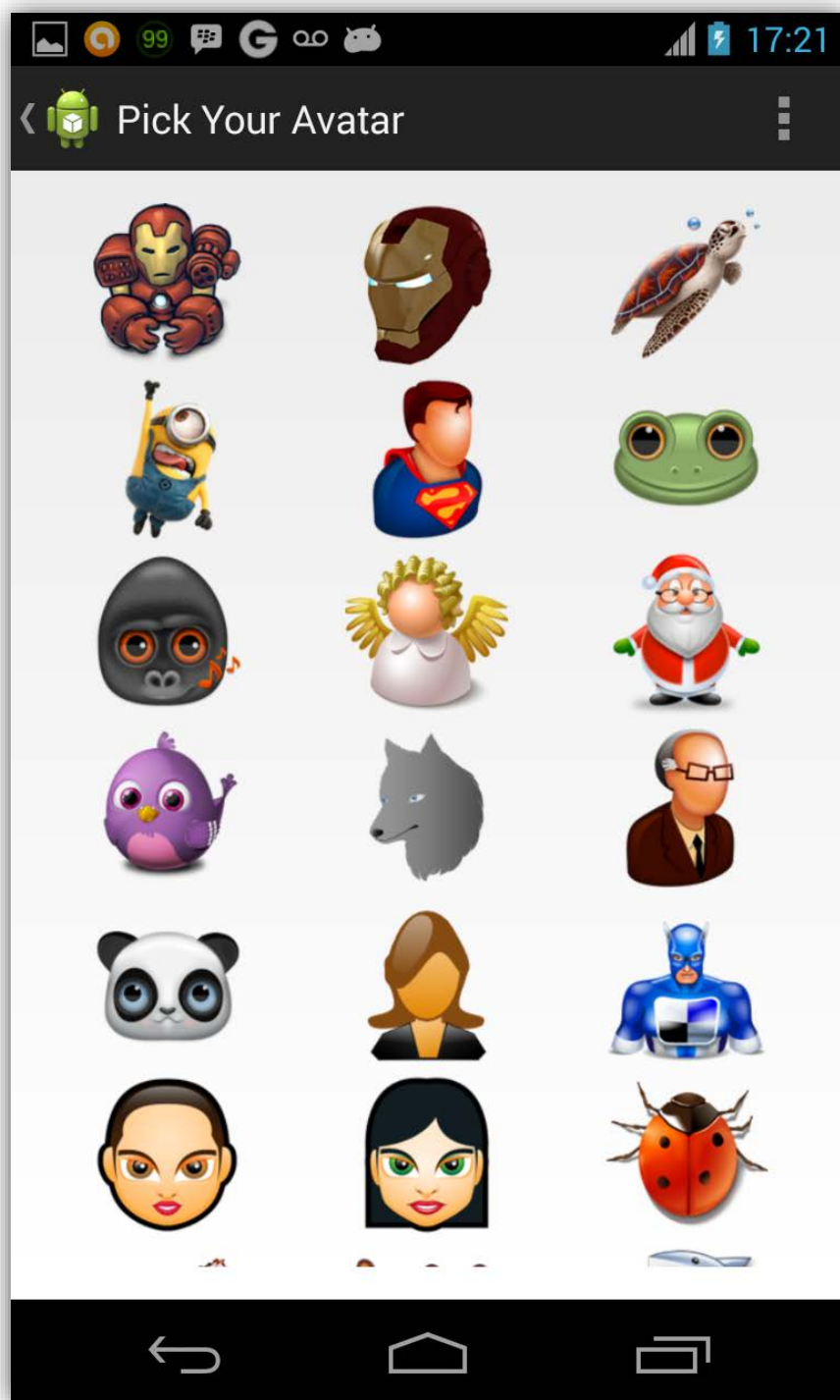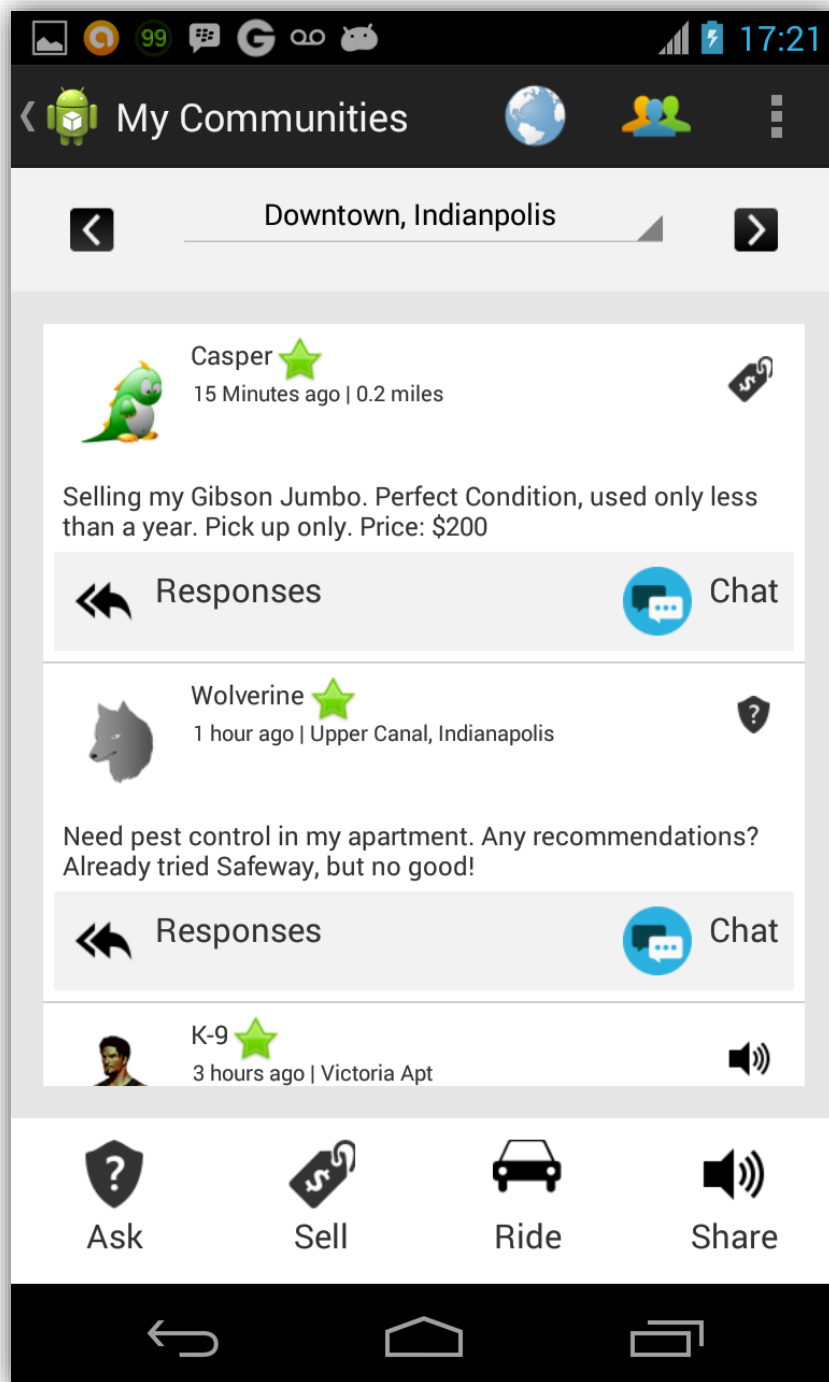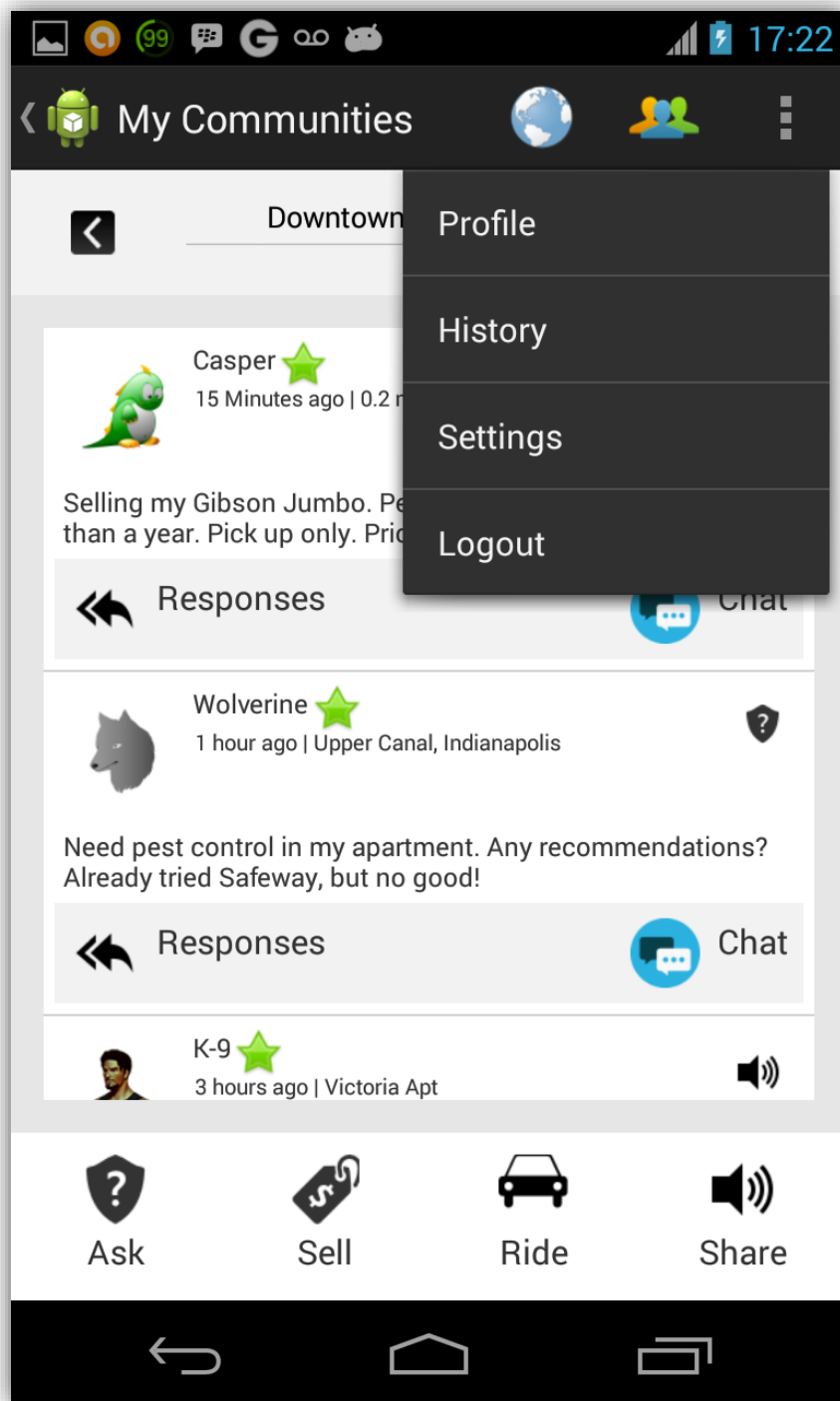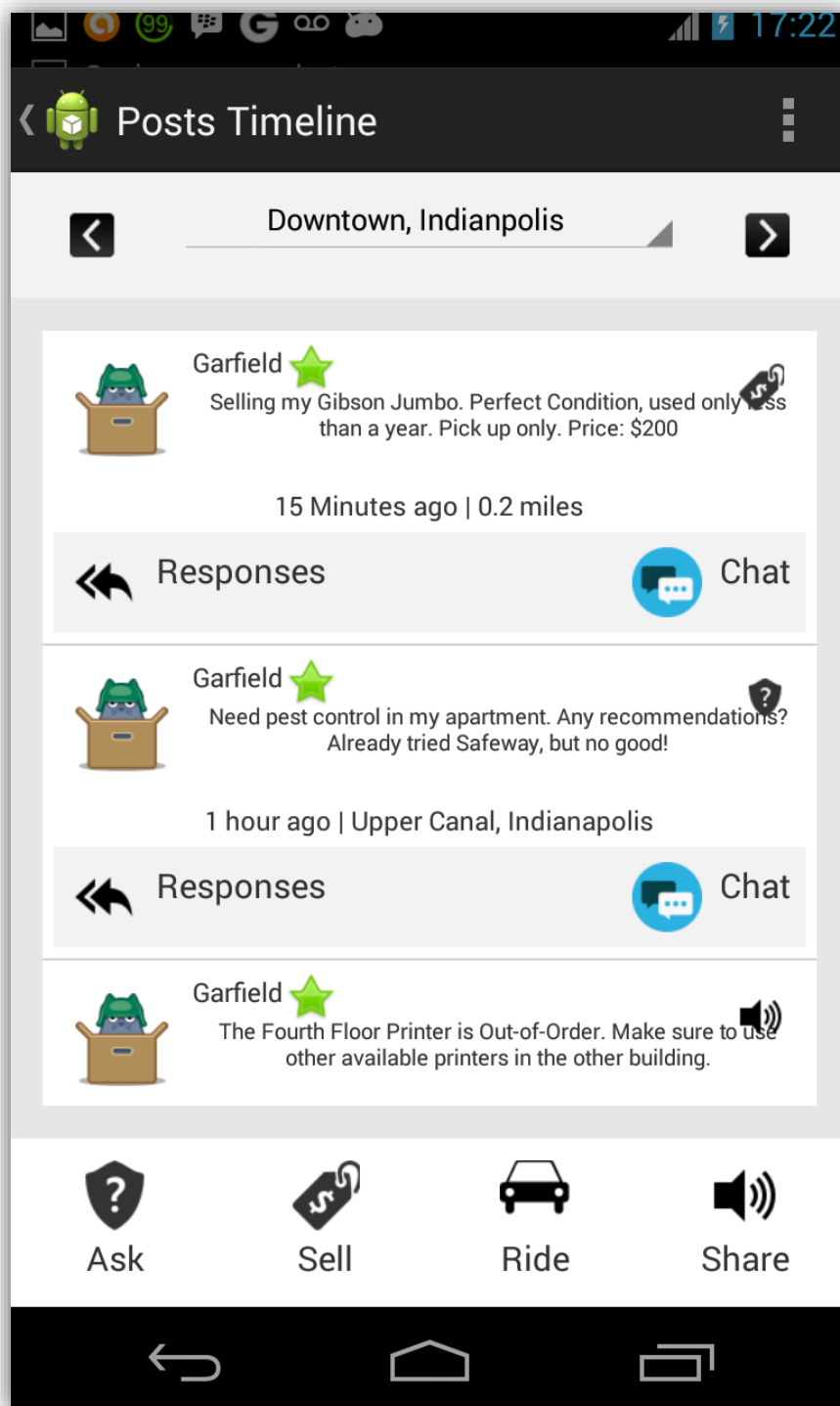
G. Resources as External Links

- Link to Hi-Fi Prototype Video Walkthrough:
  https://iu.box.com/s/v4jvjc8c7v44t3up49dy

- Link to HomeTurf Introductory Video:
  https://iu.box.com/s/s9l0snglul81z84iwz0k

- Link to HomeTurf Lo-fidelity prototype: http://go.iu.edu/9mB

- Link to HomeTurf Hi-fidelity prototype (Android app):
  https://dl.dropboxusercontent.com/u/37055351/HomeTurf.apk

- Link to Evaluation Packet:
  https://docs.google.com/document/d/1ib7vTc3n1PwTtQqERg4funYIR6uqGwM
  9rZl1UE6hxD0/edit?usp=sharing

H. References (Conceptual Design)

1. Ren, Y., & Kraut, R. E. (In press). **A simulation for designing online community: Member motivation, contribution, and discussion moderation.** Human Computer Interaction

2. Burke, M., Joyce, E., Kim, T., Anand, V., & Kraut, R. E. (2007). **Introductions and requests: Rhetorical strategies that elicit community response**. C. Steinfield, B. Pentland, M. Ackerman & N. Contractor (Eds.), *Communities and technologies 2007: Proceedings of the third communities and technologies conference*. New York, NY: Springer Publishing Company.

3. **The Intellectual Challenge of CSCW: The Gap Between Social Requirements and Technical Feasibility**, Mark S. Ackerman (Computing, Organizations, Policy and Society Information and Computer Science, University of California, Irvine and Project Oxygen Laboratory for Computer Science, Massachusetts Institute of Technology)

4. **Information Revelation and Privacy in Online Social Networks (The Facebook case)**, Pre-proceedings version. ACM Workshop on Privacy in the Electronic Society (WPES), 2005, Ralph Gross, Alessandro Acquisti

5. Ren, Y., Kraut, R. E., & Kiesler, S. (2007). **Applying common identity and bond theory to the design of online communities**. *Organizational Studies, 28(3),* 379-410.

6. IBM Research, Social Technologies: Project SOCITIES https://www.research.ibm.com/haifa/projects/imt/social/societies.shtml

7. Privacy concerns with social networking services

8. Social network profiles help thieves guess your Social Security Number

9. Usenet: http://en.wikipedia.org/wiki/Usenet

10. Online Community: http://en.wikipedia.org/wiki/Online_community