

*An Entertainment Recommender Mobile Application*  
*Finding the things you want to do in real-time*

Tudu

# Tudu: Midterm Report

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## Abstract

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In this paper we present Tudu, a dynamic entertainment recommender Android application which suggests location-based activities in real-time. Suggestions may include activities for venues, restaurants, or events. Tudu allows users to choose between two types of personalized suggestions: “Truth” or “Dare” when finding an activity to do. “Truth” suggestions are more likely to correspond with frequent activities of the user, whereas “Dare” is more likely to give suggestions outside of the user’s common activities. The high-fidelity prototype for Tudu was created using an Android skin and functionality was replicated with the use of HTML, JavaScript, and CSS in Dreamweaver.

The core concepts highlighted by the application are: *Serendipity*, *Memorability*, and *Sociability*. The results of the usability study determined that although conceptually Tudu is appealing to users, the core features require more transparency in the case of navigability, which denotes *memorability* and also in regards to distinguishing between “Truth” and “Dare”, which denote the factor for *serendipity*. Additionally, the application should optimize the interface features and typical interaction style, in our case being the Android platform and texting, which would promote *Sociability*. The feedback from the usability study was taken into account in improving the final revision of Tudu.

# I. Problem Space

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## A. Context

The Tudu mobile application is a recommendation system for venues, events, and restaurants. It is designed to be used in real-time decision-making for possible ways to spend leisure time. While this in itself is not a unique idea, it has yet to be exploited in the mobile market. In relation to other products that are on the market, it is similar to other rating and recommendation systems such as Freetime Check, Urban Spoon, Yelp, and Eventful. Our product differs in a few key factors, though. First and foremost, our product will be designed and optimized to run on a mobile device. Secondly, our product will provide location-based suggestions for things to do in real-time. Tudu's goal is to fill this niche. For the end user, we aim to provide a convenient and easy way to find and try out new activities to do using a system which learns the customer's preferences and is location-based in an attempt to make more personalized suggestions.

## B. Use

We will be designing an application to be used on a mobile device, primarily comprising a recommendation system to suggest venues, events, and restaurants that are opportune in time and location. These are all non-digital forms of entertainments.

## C. People

### Primary Users

The primary users are 20- to 35-year-old college students and working professionals who live in a large city. When they have some free time after work or during weekends, they like to socialize with friends, try new things, and attend entertainment activities (i.e. clubbing, restaurants, concerts, movies). They have at least one social media account and are opinionated enough to rate products, articles, and events online. The primary users are technically savvy and own a Smartphone and/or tablet. They prefer texting over talking on the phone. They are familiar with downloading mobile applications that entertain them with music, videos, games, and other tools that support their daily activities. Easy access to information, quick search options, and fast turnaround time is preferred as they are usually on-the-go. They rely heavily on their mobile device to stay in touch with other people, entertain themselves, take pictures/videos, and receive reminders.

### Secondary Users

The secondary users include the people who do not directly interact with the application, which include friends/family/colleagues of primary users who may accompany them to an entertainment event. They have basic to moderate computer skills, and may own a social media account. However, they rarely use their social media account. They may own a mobile device, but primarily use it for communicating with close friends and family, rather than for entertainment purposes.

### User Communities

The user communities include Facebook, Twitter, Google+, and LinkedIn users. They are interested in sharing their opinions and letting other people know of their current activities. They are curious to know what their friends are doing as well. They encourage public participation by inviting people or sending recommendations to events through their social media account.

#### **Excluded Users**

Those excluded are people who are not very tech savvy, who rarely use a computer. They may own a mobile device, but their device is out-dated and simpler than Smartphones and tablets. Also excluded are children under 13 years old are also excluded. If they are too young to have a Facebook account, they are too young for Tudu.

### **D. Usability and Experience Goals of the Users**

#### **Usability Goals**

*Effectiveness.* Tudu promotes simplicity and ease of use to all users. The user should be able to freely sync to any social networking site of their choosing in a minimal amount of steps to build their own Tudu profile. The two-click feature will create an environment where users can easily figure out what to do.

*Efficiency.* Tudu promotes a two-click system. Two clicks will get you anywhere you want to go. Music, restaurants, events, friends, and back to home are only two clicks away with Tudu.

*Utility.* Tudu is a recommendation system with a simple interface that can be downloaded onto most mobile devices. Tudu uses a recommendation system that finds the current location of the user to suggest forms of entertainment in the real world.

*Learnability.* The clean graphics of the Tudu interface and two-click system make all navigation and content easy to use.

*Memorability.* Tudu enhances the user's memory by storing their preferences and friend's suggestions to remind users of the things they have liked in the past and to explore future activities that they may want to do.

#### **User Experience Goals**

*Enjoyable.* With Tudu users will enjoy the ease of use finding things to do, as well as creating their own profiles, linking to their favorite social networking sites, and being able to suggest forms of entertainment.

*Convenient.* Tudu can be used almost anywhere and on a number of mobile devices. You can access it while you are on-the-go.

*Exciting.* Users will find it exciting to know what to do in a new and different place whether planning for a night on the town or visiting a new city.

*Entertaining.* Tudu is an all-inclusive entertainment recommendation system where you can choose and make suggestions on forms of entertainment for yourself and your friends. The recommendation system promotes a fun and surprising user experience.

## II. Conceptualizing

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### A. Designing a Representation of the Target System

Tudu recommends as a friend boasting a location-based entertainment recommendation system. It will suggest the best places to go and activities to you in real-time. Like a good friend, Tudu listens to you by keeping track of how you rate the things you like to do. Tudu is adaptable and flexible, offering a personalized experience with three interaction styles: instructing, conversing, and exploring.

Play a game of *Truth or Dare*. With *Truth*, Tudu will be a friend who knows your preferences, who knows what you would like to do. Tudu will suggest something similar to things you do quite often. Or choose *Dare* and try Tudu as your adventurous friend. A new and exciting thing to do or things you don't often do will be recommended to you. Enjoy the serendipity that comes from being recommended something new that you discover you really like to do. Tudu is an intelligent design that can handle your recurring and changing tastes in food, music, or venues while making location and time-specific suggestions.

### B. Building Objects and Actions

**Conversing** - By rating past activities users, help to refine their preferences without explicitly defining them. As users accumulate an **activity history**, they are able to rate their past activities, whether they liked their experience or not. Tudu then analyzes ratings and suggests activities similar to the past suggestions that the user has liked.

**Instructing** - Tudu will be an application on a touchscreen mobile device. Users will use buttons displayed on the touchscreen to navigate through the pages.

**Exploring** - Tudu will host basic information about activities. In depth information would be redundant or hard to maintain. Instead, Tudu will contain links to external sites where users can find more information.

### C. General Proposal of the Product's Objects and Interactions

The **activity history** will keep track of the users past activities and provide a **rating tool** for the user to rate their past activities and keep their preferences current. The application will provide necessary **activity information** for suggestions, as well as **customizable profile preferences** and **general application settings** to grant the user control over how the application will support their needs.

The interface will consist of simple menus and buttons to access relevant and current activity information within two clicks. All application features will be available 24 hours a day on the user's mobile device and anywhere the user is located (i.e. home, office, school, or out in the general public). The application will be context-aware of the user's location, so the recommendations will suggest activities near the user's particular location. The interface design will be effective, efficient, error-tolerant, useful, easy-to-use/learn/remember, and aesthetically pleasing.

### III. Identifying Needs & Establishing Requirements

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#### A. Target Audience and Their Needs

##### Characteristics

The target audience for the Tudu entertainment recommender mobile application ranges in age from the college student to the young, working professional who lives in a metropolitan area, and who wants to be social and find things to do in their leisure time. They like activities that can offer an enjoyable experience with their group of friends, family, and co-workers. They may visit the same places and eat at their favorite restaurants, but are open to trying new experiences. They most likely use their Smartphone at work, school, home, and in the general public to browse the web for information, news, check social media accounts, and stay in touch with their friends and family. They use a Smartphone because it is easy, fast, and convenient to get the information they need whenever and wherever they may be.

##### Goals

The main goal of Tudu's target audience is to quickly find and decide on something to do in their leisure time. The tools that they use should be effective, easy to learn, and convenient. They want to enjoy activities with others, because they believe sharing a new experience is more fun and exciting.

##### Needs and Expectations

The target audience will need the Tudu application to be accessible on their Smartphone since they are usually on-the-go. They will expect this application to be convenient and to have a high degree of learnability and memorability in order to accomplish their goal of finding something to do. They need to know information about an activity, such as the location, pricing, times of operation, and driving directions. They also need to know what other people think about a venue or event to determine if they want to attend. They need to easily communicate with their friends to collaborate once they have found an activity of interest. The activity information will need to be delivered quickly, be personalized to their interests, location-based, concise but informative, and up-to-date, so that they can effectively and efficiently discuss their plans.

##### Persona 1: Regina

###### *Background:*

- 23 years old
- Female
- Caucasian
- Single
- Elementary Education student
- Works part-time during week nights
- Salary: \$18,000

###### *Motivations:*



- Spending time with friends and family
- Amusing entertainment, YouTube, listening to music, spontaneity
- Quiet moments to reflect and relax

*Frustrations:*

- Wasting time, being bored
- Indecisiveness
- People who don't answer their phone or text back
- Spam emails
- Out-of-date information online

Regina is currently a 4th-year Elementary Education college student at Indiana University-Purdue University Indianapolis. She is focused on her school work, but takes advantage of any free time she has by going out with her friends to have fun and de-stress. She and her friends like going to the movies, dinner, shopping, and going to places where there is good, live music. She considers herself somewhat tech savvy because she often uses her iPhone to call and text her friends, check her Facebook and Twitter accounts, browse the web, watch videos, and take pictures. She carries around her iPhone all the time because it makes her feel secure and sophisticated.

**Persona 2: Alfonso**

*Background:*

- 28 years old
- Male
- African-American and Puerto Rican
- Married
- Information Technology consultant
- Salary: \$60,000

*Motivations:*

- Being a father and husband
- Working out/playing sports
- Hanging out with his buddies

*Frustrations:*

- Sitting in traffic
- Paying bills
- Mean customers
- Missing out on popular events

Alfonso currently works as an Information Technology consultant in Sacramento, CA. He has a wife and a 3-year-old son. He enjoys spending quality time with his family on outings to the city during his leisure time. He frequently browses the Internet on his Android phone or home computer for family-oriented activities during the weekends that are affordable. He often takes pictures and videos on his phone to capture their memories together. Aside from spending time with his family, he also likes hanging out with his buddies whenever he can. They often go to the

gym and play sports. Once in a while, they will also go to a comedy club or to the bar for a drink or two.

## B. Requirements Analysis

Interviews were conducted in order to better understand the factors that the target demographic typically takes into account when deciding on something to do, and how those factor might influence their use of Tudu. Each interviewee was given an overview of Tudu and asked 10 interview questions. **Refer to Appendix A for the list of questions and detailed graphs of the interview results.**

Through analyzing the results of interviews with the target audience for Tudu, we assembled the following requirements. The requirements listed below provide a framework that will guide the Tudu entertainment recommender mobile application through the design process.

### 1. User requirements

- The user must be able to get the suggestions through their mobile device.
- The user must be able to personalize their subjects of interests.
- The user must be able to contact or invite their friends.
- The user must be able to see what their friends are doing.
- The user must have a unique screen name.
- The user must be compensated for submitting reviews.

### 2. Functional requirements

- The product must display prices, location, and hours of operation about activities.
- The product must be a “one-stop” shop for their interests.
- The product must be able to retrieve friend’s current status and favorites.
- The product must provide an integrated real-time messaging system.
- The product must have hands-free feature--voice commands.

### 3. Usability requirements

- *Effectiveness*
  - The product must make suggestions relevant to the user’s interests.
  - Product must be able to show what friends are doing.
- *Efficiency*
  - The product must deliver the suggestions promptly.
  - The product must be able to connect friends quickly.
- *Safety*
  - The product must allow for private conversations with friends.
- *Learnability*
  - The product must be easy to learn and use.
- *Memorability*
  - The product must store the preferences and favorites of the user.

#### **4. Data/Content requirements**

- The content must be up-to-date.
- The product must know if the data corresponds to the user's interests.
- The data for friend's statuses and favorites must be accurate.

### **C. Task Scenarios**

#### **Regina, the Student**

Regina, 23, is a student at Indiana University-Purdue University Indianapolis. She is usually in class most of the day, and rarely sees her friends during the week, as she works a part-time job in the evenings. It's Saturday night, and she is at home, but wants to do something with her friends. She opens the Tudu app to see what her friends are doing. She checks her friend's statuses and sees that they are at a local club. Regina then clicks on the venue information to find out the cover charge and the location. She has never been there before and decides to go by clicking the "Du It" button. Tudu asks her if she would like to invite other friends, so she sends an invitation to another friend who is also using Tudu. Her friend let's her know via Tudu messenger that he would like to join her, and offers to pick her up. Her friend arrives and she clicks on the address of the local club in Tudu. They drive together to the club using her iPhone's GPS that is linked to Tudu.

#### **Alfonso, the Family Man**

Alfonso, 28, is married and has a 2-year old toddler. It is 3pm on Sunday afternoon, and he wants to take his family out for nice affordable meal. He decides to check out Tudu on his Android phone to get a suggestion on a place for his family to eat. A new restaurant pops up as a suggestion, and he clicks "Du It" to accept. He loads his family into the Toyota Prius, and uses his phone's GPS to get directions from Tudu. It is 3:45pm and they have just arrived at the new restaurant. However, there is a 45 minute waiting list. He and his family decide they do not want to wait. He opens Tudu to find another restaurant close by. Tudu suggests an Italian eatery a block away. He reads the reviews that are listed to see if this is a good place to take his family. Alfonso and his family are pleased by the reviews and he clicks "Du It" to accept the suggestion. They hop back into the car and use directions from Tudu again. They arrive at the newly suggested restaurant and are seated right away. At the end of his meal he decides to rate the Italian restaurant with a "thumbs up" on Tudu.

## IV. Design & Prototypes

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### A. Concept Design

#### 1. Product concept explained in detail

Tudu is an entertainment recommender mobile application designed for use on Android devices with a touch screen interface. It essentially serves as a friend helping you decide on things to do and remembers your personal preferences. At the core of Tudu's functionality and features are three key experiences which can be obtained by the user: *Serendipity*, *Memorability*, and *Sociability*.

##### Serendipity

The Tudu experience begins on the Home screen where user must select a suggestion randomizer: "Truth" or "Dare." Based on the selection, the user will be presented with a new location-based suggestion. The "Truth" selection gives the user a suggestion similar to activities they have recently done or added to their favorites. The "Dare" selection presents the user with activities that may not have been done by the user in a while. Once the user's selection has been made the suggestion will be displayed on the Suggestion page. The user can navigate through the Info and Reviews tabs to get general information and reviews about the suggestion to finalize their decision and decide to "Do It." By selecting "Do It" on the Info tab the user will be asked if they would like to invite a friend. Also, the Chat tab in the Suggestion page allows the user to easily connect with friends who might want to join the activity. The moment of *serendipity* comes when the user finds something new and exciting to do and can instantly share with friends.

##### Memorability

Tudu's rating system is intelligently engineered to recommend suggestions based on the user's interests along with past likes, dislikes, and favorites. The ratings system which is featured in the History page allows Tudu to recommend similar, as well as adventurous new things for the user to do. The overall Tudu user rating can be viewed on the Info tab for each activity. Extending your memory, Tudu makes suggestions on what you will enjoy discovering next. This *memorability* factor allows Tudu to remain adaptable and to provide personalized suggestions. Tudu keeps up with you as your tastes in food, music, and activities providing you with real-time, location-based activities that you will enjoy.

##### Sociability

Tudu enhances *sociability* every step of the way. A Social page along with an integrated instant messaging system that can be accessed from anywhere in Tudu allow users to quickly connect with friends through chat, status updates, and invitations. After deciding on something to do a user can choose to invite a friend to join or click on the Chat tab to share the information about the suggested activity with friends. The user can navigate away from a conversation and back to the suggestion by simply clicking on the appropriate tab or back button. The user can also visit

the Updates tab to view the friend's status updates to see what friends are currently doing and if they are available to join them. At any time a user can send invitations to friends to join Tudu by selecting "Invite a Friend" from the menu. The seamless integration of instant messaging and information on what friends are doing make it easy for friends to collaborate on planning what to do and experience new things together.

### Tudu Information Architecture

The following figure gives a view of the overall information architecture for Tudu.

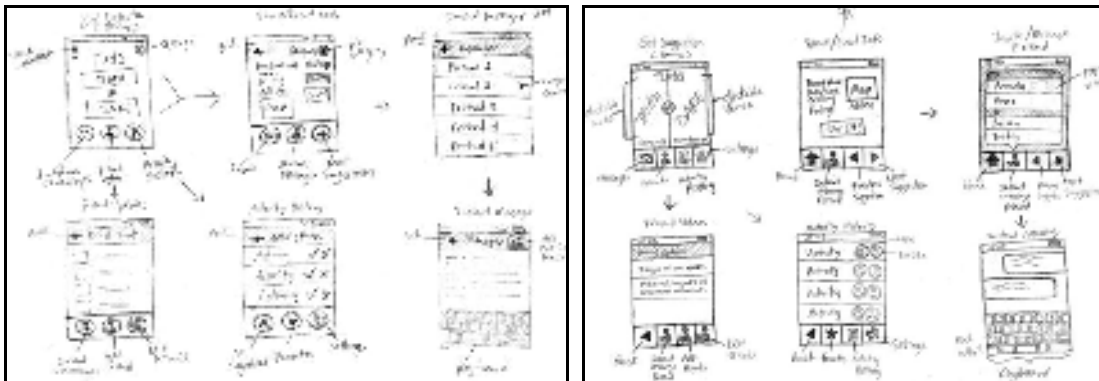


Figure 1. Tudu Information Architecture

Refer to Appendix B for the detailed information on the first level of the navigation (the main pages) and also for the second level of the navigation (the tabs in each main page).

## 2. Multiple Sketches

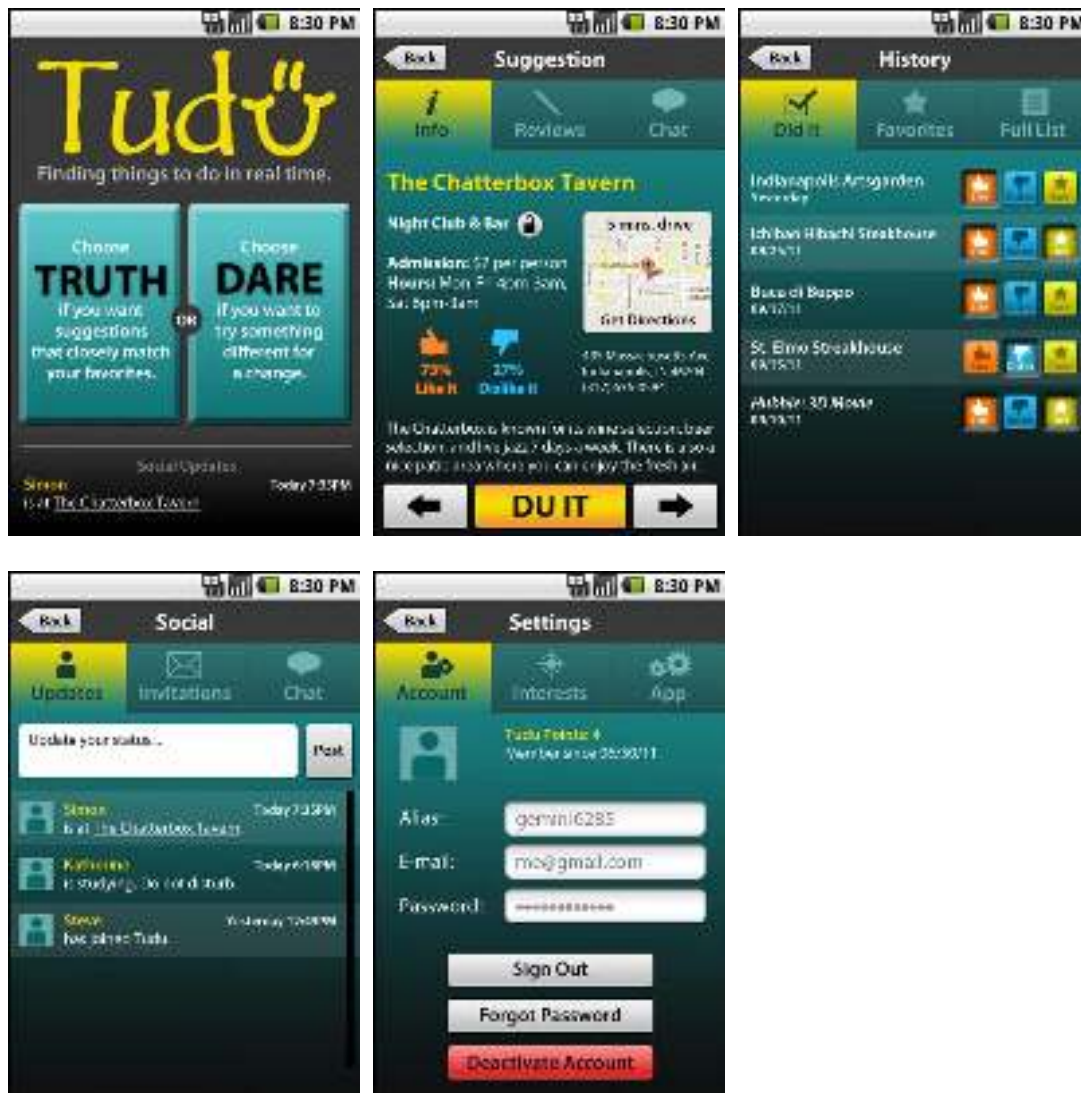
Preliminary sketches for the Tudu application were created to determine an appropriate and efficient interface that would support the user experience.





### 3. Low-fidelity Prototype

Based on the sketches, a low-fidelity prototype was derived to display the interface of the Tudu application and to better visualize the information architecture in the overall design.



Refer to Appendix C to see all low-fidelity prototypes of the main screens/tabs.



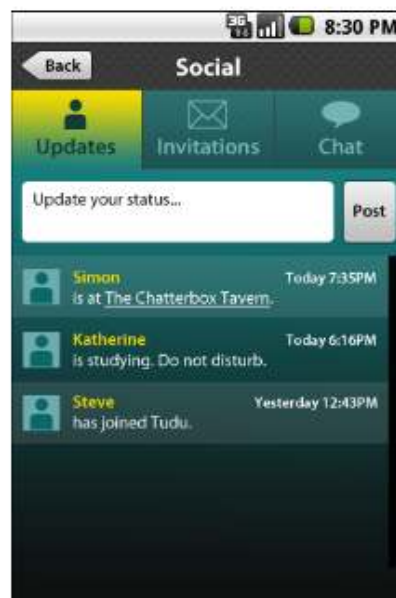
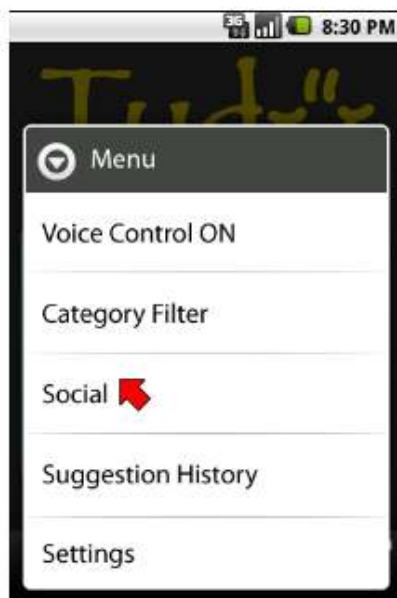
## B. Scenario in Action

The scenario for Regina, the IUPUI student, was used to demonstrate the user interaction with the low-fidelity prototype.



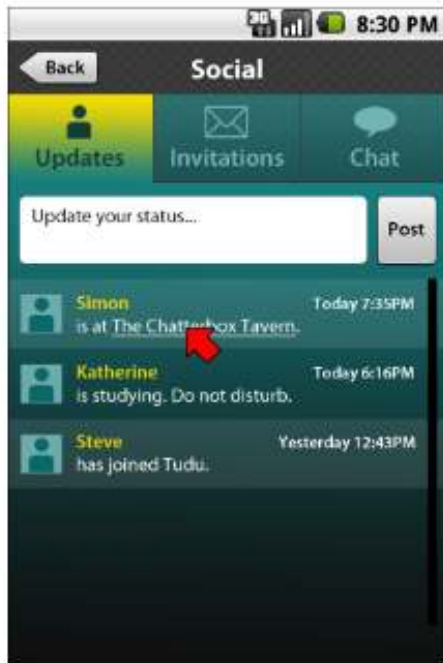
Regina, 23, is a student at Indiana University-Purdue University Indianapolis. She is usually in class most of the day, and rarely sees her friends during the week, as she works a part-time job in the evenings. It's Saturday night, and she is at home, but wants to do something with her friends.

She opens the Tudü app to see what her friends are doing.



She checks her friend's statuses and sees that they are at a local club.

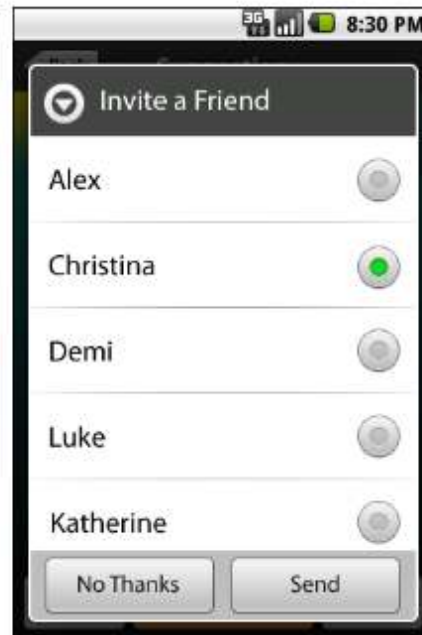




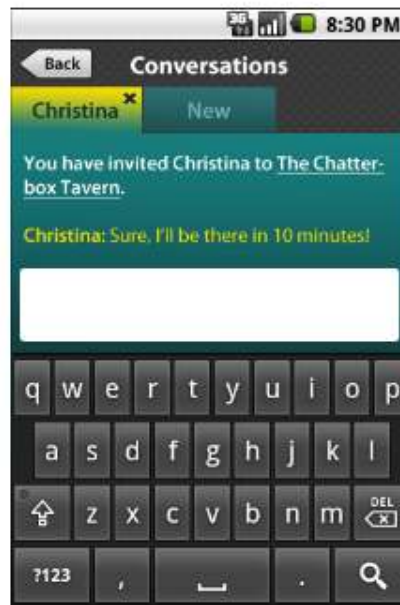
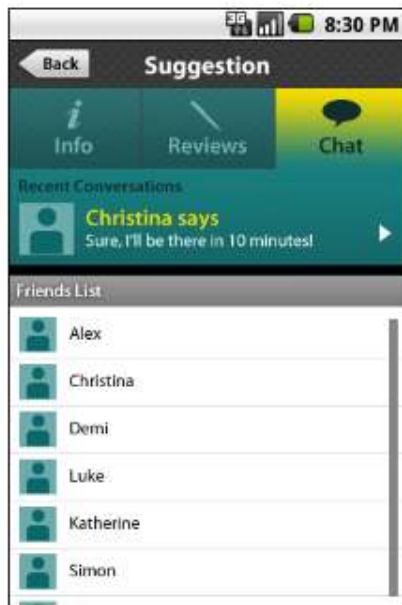
She clicks on the venue information to see how much the cover charge is and the location.



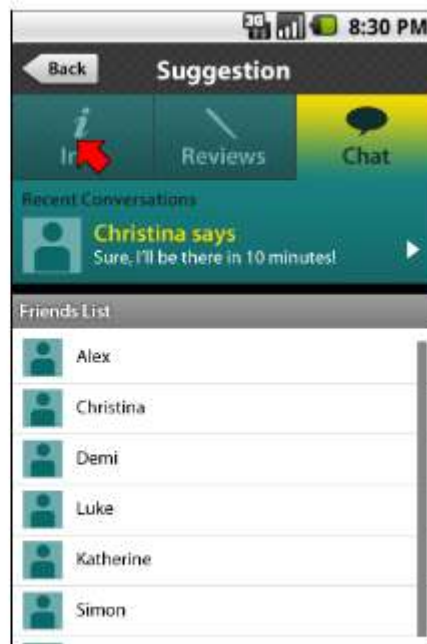
She has never been there before and decides to go by clicking the "Do It" button.



Tudu asks her if she would like to invite other friends, so she sends an invitation to another friend who is also using Tudu.



Her friend let's her know via Tudu messenger that she would like to join her.



her friend comes to her house and they get in the car...



She clicks on the address of the local club in Tudu.

They drive together to the club using her phone's GPS that is linked through Tudu.

**Fin**

## C. High-Fidelity Prototype

### 1. Development

A high-fidelity interactive prototype was created to visualize the conceptual idea for Tudu on an Android phone. It was developed from the low-fidelity digital illustrations using HTML, CSS, and JavaScript in Dreamweaver.

The high-fidelity prototype used during the usability testing can be viewed at: <http://www.katherinepmanuel.com/tudu/home.html> (see URL for the revised high-fidelity prototype in the "Revised Interactive Prototype" section).

### 2. Explanation of Interaction and Interface Design Components

The high-fidelity prototype showcases the five main pages of Tudu: Suggestion, Suggestion History, Social, Settings, and Home. They can be accessed from the Android phone's menu button at any time. Tudu has a ubiquitous navigation system which features three tabs and a Back button arranged at the top of each page. The main interaction types on Tudu are outlined below.

### **Exploring**

Exploring is Tudu's primary mode of interaction. Exploring begins at the Home page where the user can choose which type of recommendation s/he wishes receive: "Truth" or "Dare". Choosing the "Truth" button will suggest an activity that is similar to the user's recent activities and favorite things to do, whereas the "Dare" button will suggest an activity that the user may not have experienced in some time, but still something that the user at least showed some interest in at one point. At its core, Tudu is driven by two different suggestion algorithms: the *Truth* algorithm and the *Dare* algorithm.

The *Truth* algorithm works by finding those categories of events, venues, and restaurants that the user has done most recently and giving those categories a higher probability of being suggested. However, the weight for a specific event or venue that has recently been done is decreased. For example, if I have been upvoting and "Du"ing Mexican restaurants for the last two months, Tudu will be more likely to suggest another Mexican restaurant if I select "Truth" when looking for someplace to eat, but not the same exact restaurant I've recently been to.

In contrast, the *Dare* algorithm looks to suggest events, venues, and restaurants in categories the user may have expressed an interest in in the past, but which has not been done recently. For example, if my Tudu preferences have Chinese food selected as a category of interest but I have only been "Du"ing Mexican restaurants for the last two months, Tudu will be more inclined to suggest Chinese when "Dare" is selected.

Both options, Truth and Dare, provide location-based suggestions. The option to choose provides a sense of serendipity and discoverability to the user experience. The user can explore the information regarding a suggested activity and freely move between suggestions using the Previous and Next arrows at the bottom of the screen. When the user accepts a suggestion by clicking the "Du It" button located at the bottom of the page, Tudu will automatically bring up an option for the user to invite some friends to the suggested activity. All suggestions that the user has received will be added to the History page so users can revisit the suggestion information at any time. This bookmarking and storing capability denotes the memorability function of Tudu.

Another way of exploring with Tudu is from the Social page, which allows the user to check their friend's status updates, view activity invitations, or instant message a friend. Initially, the Home page will feature a running feed of friend's updates at the bottom of the screen. The Social page can be accessed from the menu at any time, enhancing the sociability of the application. The Chat feature is available as a tab in the Social page and Suggestion page, so users can quickly connect with friends upon deciding on a suggestion or planning an activity to do.

### **Conversing**

Conversing with the application will primarily occur when the user is customizing his/her personal preferences. Once a user selects "Du It" for a suggestion, then the suggestion is stored in the "Did It" tab on the History page for future rating. The user can automatically update his/her personal preferences by rating the activity using either the "Like" or "Dislike" button. Activities that are starred will be added to the "Favorites" tab in the History page. The user may also manually update his/her personal preferences by going to the Settings page of Tudu.

**Instructing**

Instructing will occur on several page buttons and menu options within Tudu. A voice control option will be available to provide the user with a hands-free way of interacting with the application. The main instructing interactions include: adding a suggestion to your favorites, locking into a category type, getting driving directions to an activity, submitting a review, inviting friends, posting a status update, adding/editing friends, saving account changes, signing out of Tudu, and deactivating your account.

## V. Evaluating the Design

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### A. Usability Study

#### 1. Interview with Users

An interview was conducted on 6 participants to evaluate the design of Tudu and gauge their feedback on the overall product concept and interaction design. The participants ranged in age from 22 to 39. Four out of six participants were male. The educational level attained ranged from the high school level to the master's degree level. The work experience varied from student status to warehouse house employee to professor status. Most of the participants cited having advanced technical skills, and all were familiar with computers and using the Internet.

The interview process consisted of: (1) an introduction, (2) a warm-up, (3) a main session, (4) a cool-off, and (5) a closing. The introduction gave a brief overview of the Tudu application and the user was asked to complete a consent form. The warm-up session asked a few general questions about the participant's usage of technology and social applications.

The main session was comprised of task scenarios given to the user one at a time in order to facilitate the exploration of various functions and features of Tudu. The tasks were randomly selected for each participant and entailed:

1. Generating a suggestion
2. Contacting friends
3. Rating or writing a review about an activity
4. Using the category filter
5. Adding a suggestion to favorites
6. Updating profile settings

Qualitative data was collected by asking each participant a series of unstructured interview questions regarding their experience while attempting the tasks:

1. What were your initial impressions of the product?
2. Did you like anything about the product? If yes, what?
3. Did you have any difficulties with using the product? If yes, what?
4. What was your overall experience while attempting the tasks?

The cool-off session asked the participant some final questions to determine their overall experience with using Tudu. Finally, closing remarks were given to the participant, thanking them for their time and feedback. **Refer to Appendix D – Table 1 & 2 for the table of results.**

#### 2. Internal Walkthrough

An internal walkthrough was conducted by one group member to evaluate the usability and interaction design of Tudu. Various tasks were performed in the way intended by the product team to explore the main interaction pages: Home, Suggestions, Social, and Suggestion History.

Upon completing the tasks, qualitative data was collected by asking the expert a series of semi-structured interview questions. Each question was accompanied by a Likert scale which consisted of 5 steps and worded appropriately to pertain to each question. (For example, Question #1's scale steps would be written as "Very easy - Somewhat easy - Neutral - Somewhat difficult - Very difficult"). The list of questions included:

1. How easy is it to get a suggestion? Why?
2. How informative is the suggestion information? Why?
3. How useful is the "Invite Friends" feature? Why?
4. How easy is it to write a review for an activity? Why?
5. How easy is it to rate an activity? Why?
6. How useful is the "Friend Updates" feature? Why?
7. How easy is it to navigate within the app? Why?
8. How useful are the menu options for each page? Why?
9. How intuitive/understandable are the buttons, labels, icons, and links? Why?

A field for suggesting recommendations for improvement was also provided within each question to highlight any key changes that could potentially solve any usability issues and improve the user experience. **Refer to Appendix D – Table 3 for the table of results.**

## **B. Assessment of Findings**

The qualitative data that was collected from the user interviews and internal walkthrough results provided helpful feedback on the use of the product and overall response to the interface and interaction design. Overall, users liked the concept of the product and its interface layout, and found the content to be informative and helpful.

### **General Problems**

The common problems were related to the navigation using the Menu button and the labeling of buttons and menu options. Both the interviews and the internal walkthrough revealed that too much was being hidden under the Menu button which affected the ability to easily navigate through Tudu.

Some users also stated that they probably would not use the Social functions of Tudu since they already had numerous ways of contacting friends (i.e. texting, Facebook). This issue was confirmed during the internal walkthrough.

Finally, the internal walkthrough revealed the difficulty in distinguishing between "Truth" and "Dare" suggestions. Although the type of suggestion was labeled at the top-right of the suggestion page, it was not clearly visible, and it fails to clearly explain why a particular suggestion was given to the user.

### **Specific Problems**

One problem with the navigation is that the "Home" link was buried in the menu. While the Home screen was never very far away, it was not obvious where this link was located. In the



upper left corner of the screen where you would typically find a link to the Home page of many websites, was instead taken up by a “Back” button. Pressing “Back” would take the user to the previous page or tab. Each tab was treated at its own page. However, as pointed out by a few of the interviewees, it is more intuitive to view the group of tabs as a single page. The Back button should not merely switch tabs.

The “Du It” button was also unintuitive for users. When clicked, Tudu opens up a box to invite friends to a suggested activity, which the users didn’t expect. They couldn’t see the underlying functionality that clicking “Du It” would add the suggestion to the “Did It” tab of the History page for future rating, as well as, allow users to invite friends to a suggested activity. The internal walkthrough also revealed this as an issue.

Another issue which arose was distinguishing between the Category Filter (meant to be a temporary search filter) and the Interests tab on the Settings page (meant to be an underlying element of the user’s profile and much more static than the Category Filter). Interviewees seemed to have trouble recognizing the Category Filter option, possibly because it was buried under the Menu. However, the initial problem might have been because the Category Filter option was not fully implemented at the time of the usability tests.

## C. Revised Interactive Prototype

To improve the navigability of Tudu, the “Back” button at the top left corner of all pages was removed entirely, considering that navigation structure for Tudu is relatively shallow and given that many Android phones have a Back button on them already. Instead, it was replaced by a “Home” button so it is more easily accessible. The Home page itself was also revamped to showcase buttons to the Social, History, and Settings pages at the bottom of the screen, bringing them out from behind the Menu button.

Complementary colors, blue and orange, were used to distinguish between “Truth” suggestions and “Dare” suggestions. A short blurb in the “Info” tab of the Suggestion page was also added to give users a concise list of reasons why a specific suggestion was being given, using the user’s activity history, user’s preferences, and their friend’s past activities. This helps highlight the uniqueness of the product to help users decide on something to do during their leisure time by discovering or rediscovering activities.

Finally, we removed the Friend Updates and Chat features from the Social page and instead integrated it directly with the user’s texting (SMS) capabilities on his/her phone, since most of our target users typically text on their phone. Overall, we feel that the Social page is still a work in progress, and has room for improvement to make it more unique to the concept of Tudu.

The lessons learned from the evaluations have been applied to the interactive prototype in an effort to maximize usability, usefulness, and intuitiveness. **Refer to Appendix E for the revised interactive prototype screenshots.**

The revised interactive prototype can be viewed at:  
<http://www.katherinepmanuel.com/tudu2/home.html>



### **Future Product Improvements**

Below are some more projected future generation product refinements to showcase the full potential of our product concept:

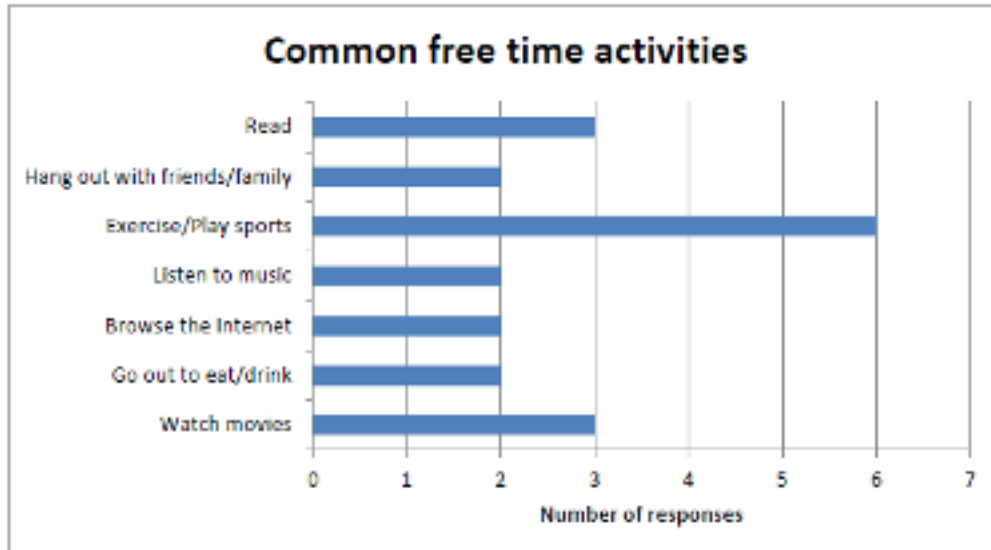
- Further improvement on the Social functionality to facilitate group chat
- Incorporate an incentive-based model for submitting ratings and reviews (i.e. the user could receive credit points and redeem prizes such as discounts and freebies.).
- Provide other interaction styles to get a suggestion, such as shaking the device (opposed to clicking buttons on the screen).

## VI. Appendix

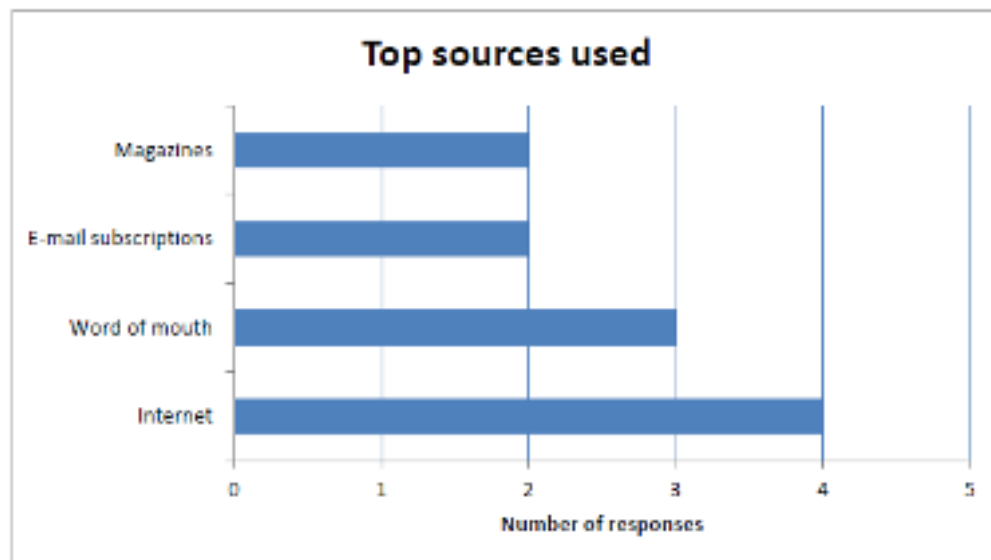
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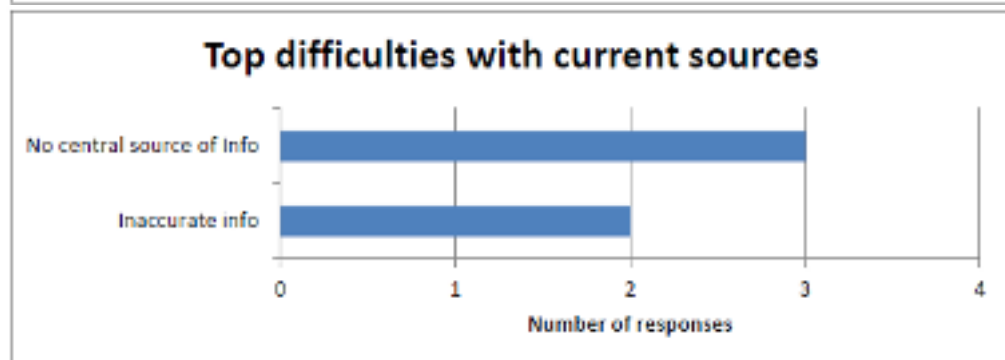
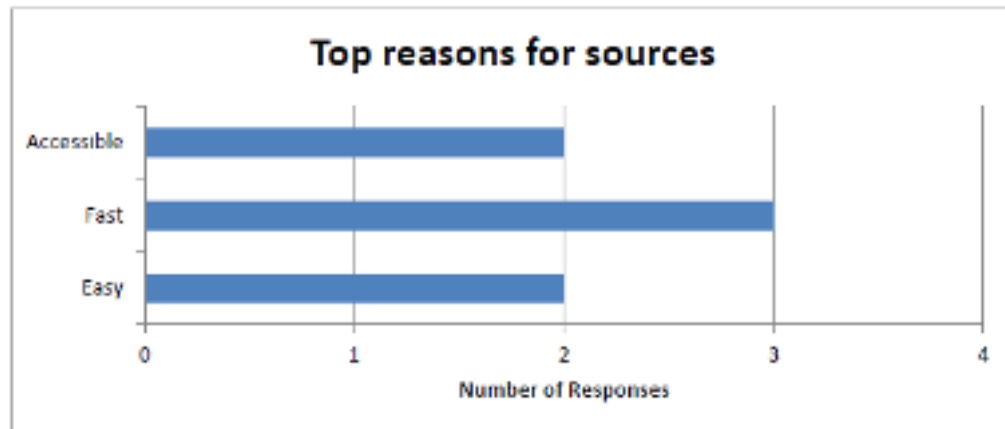
### A. Requirements Interview Results

1. What do you like to do in your free time?

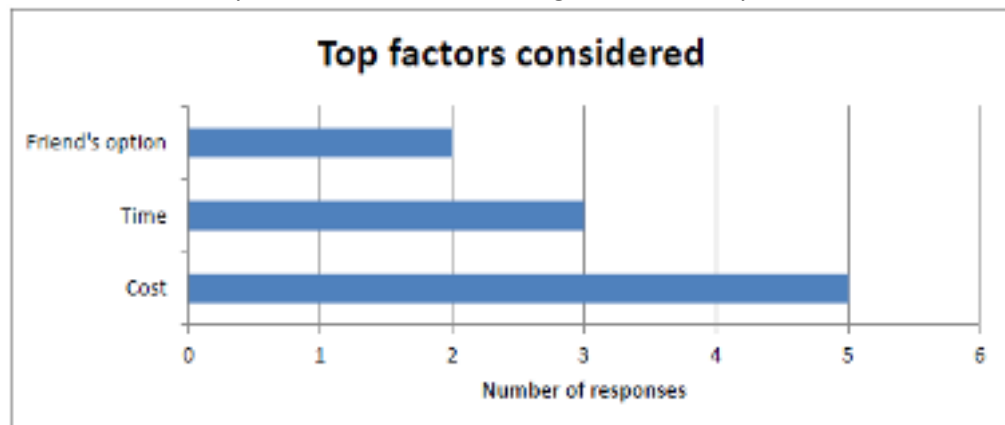


2. What sources do you use to find something to do? Why do you use those sources? Any difficulties?

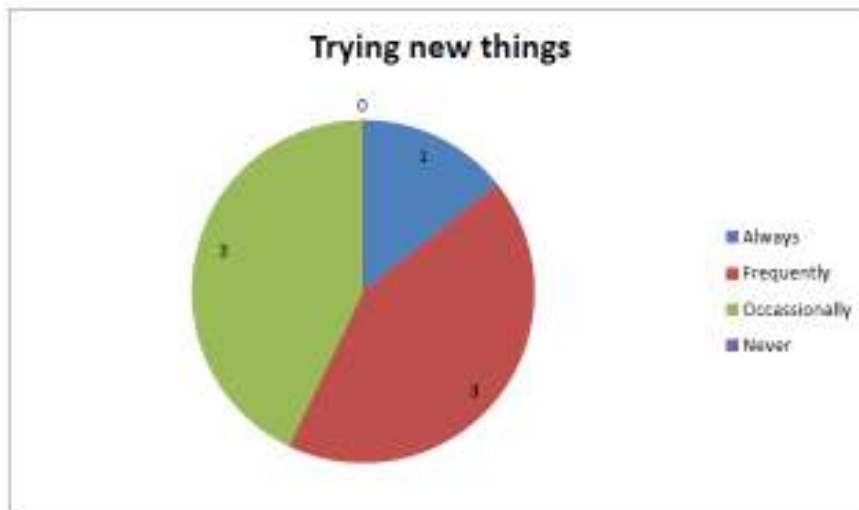




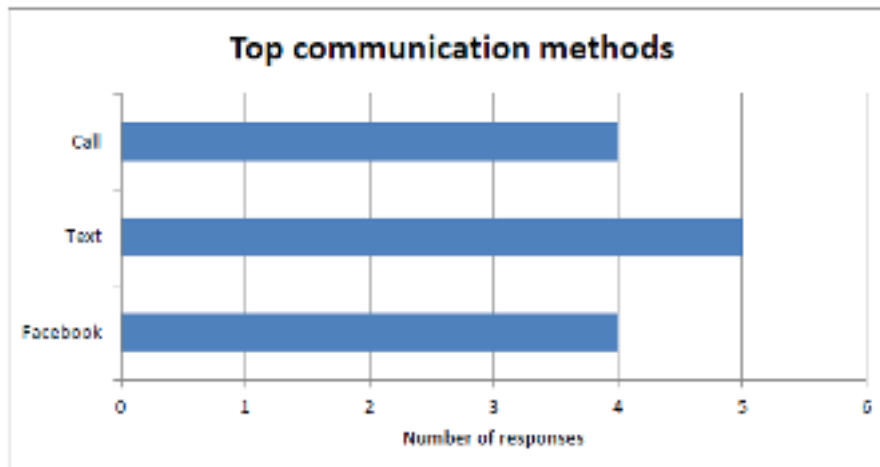
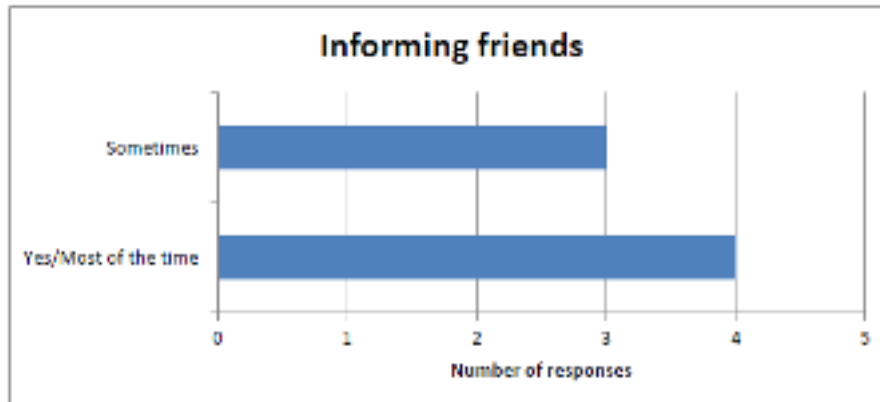
3. What factors do you consider when deciding what to do in your leisure time?



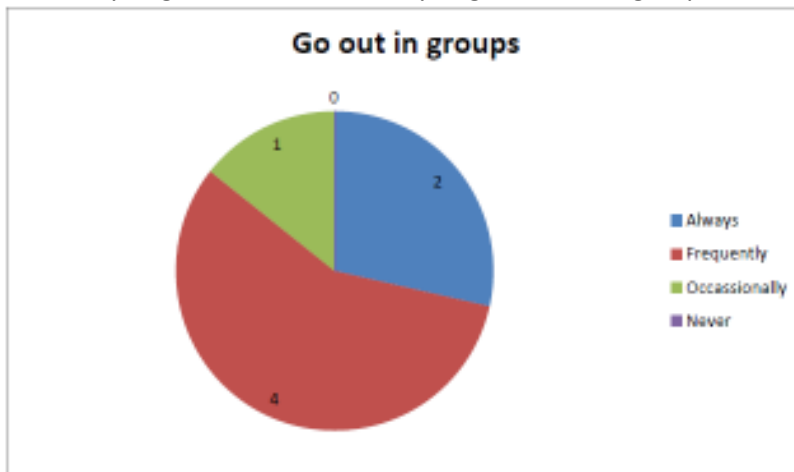
4. How often do you try new places, venues, restaurants, etc.?



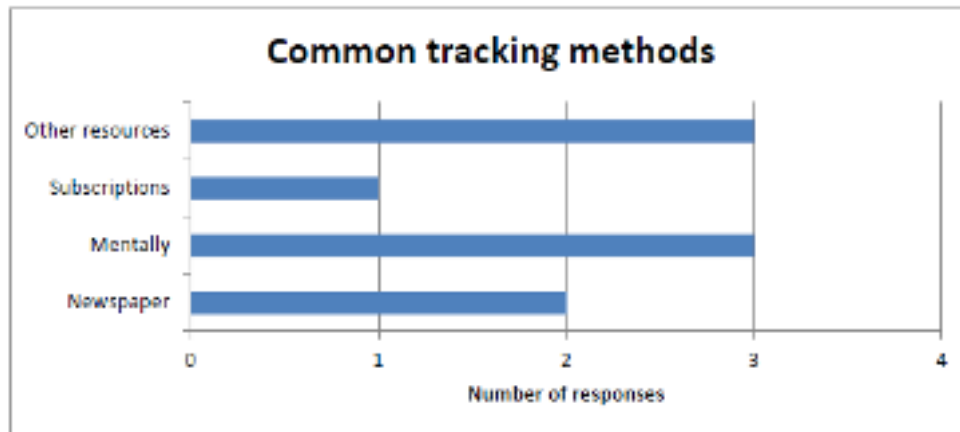
5. When you go out, do you tell your friends what you're doing? How?



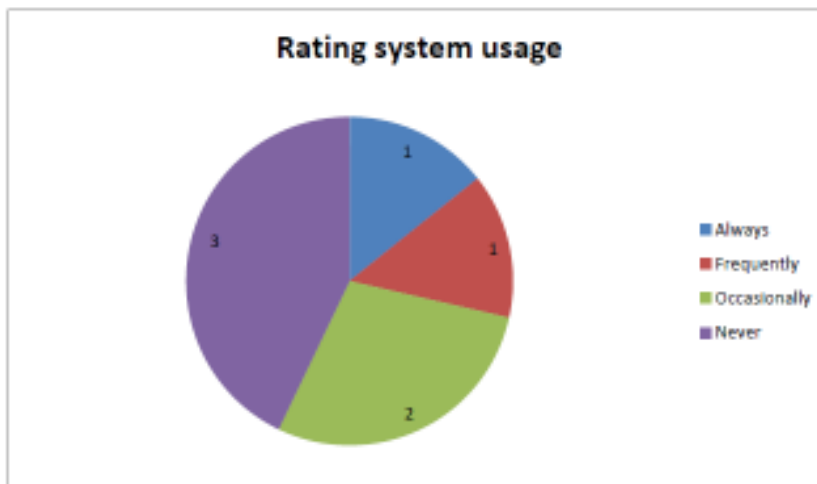
6. When you go out, how often do you go out with a group?

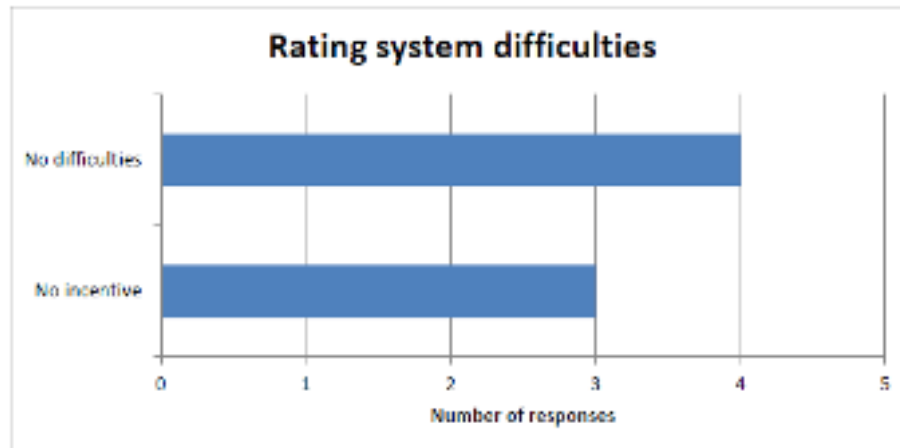


7. Do you keep track of your favorite places, venues, restaurants, etc.? How do you keep track of them?



8. How often do you take advantage of ratings systems (i.e. Pandora Radio, Stumbleupon, and Amazon)? Any difficulties?





9. Scenario: You have an open Friday evening. You and your friends currently don't have plans. However, you want to go out. How do you decide step-by-step what to do? Walk me through your decision-making process.

**Average answer was...**

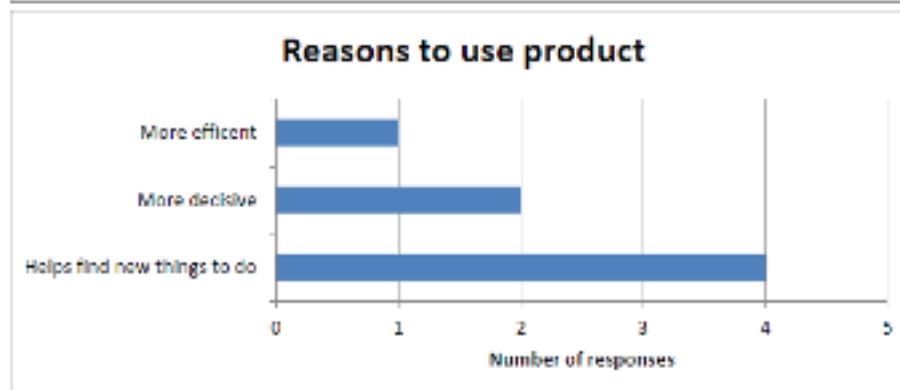
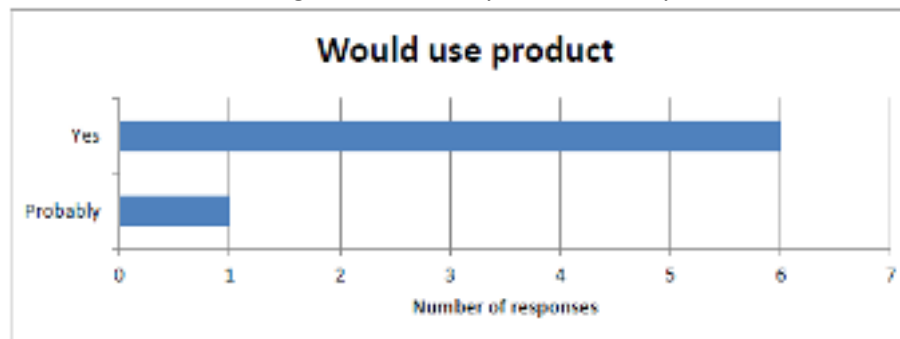
**Step 1: Contact friends**

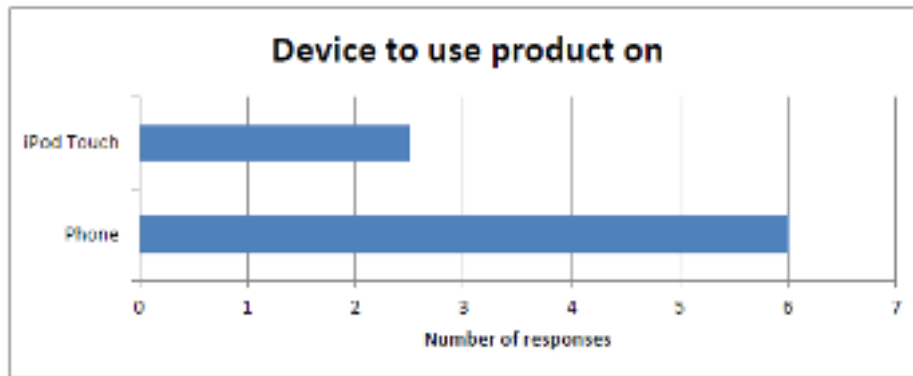
**Step 2: Brainstorm ideas**

**Step 3: Research activity information / Decide on plan**

**Step 4: Go to activity**

10. If it were available right now, would you use it? Why? How?





## B. First- and Second-Level Navigation

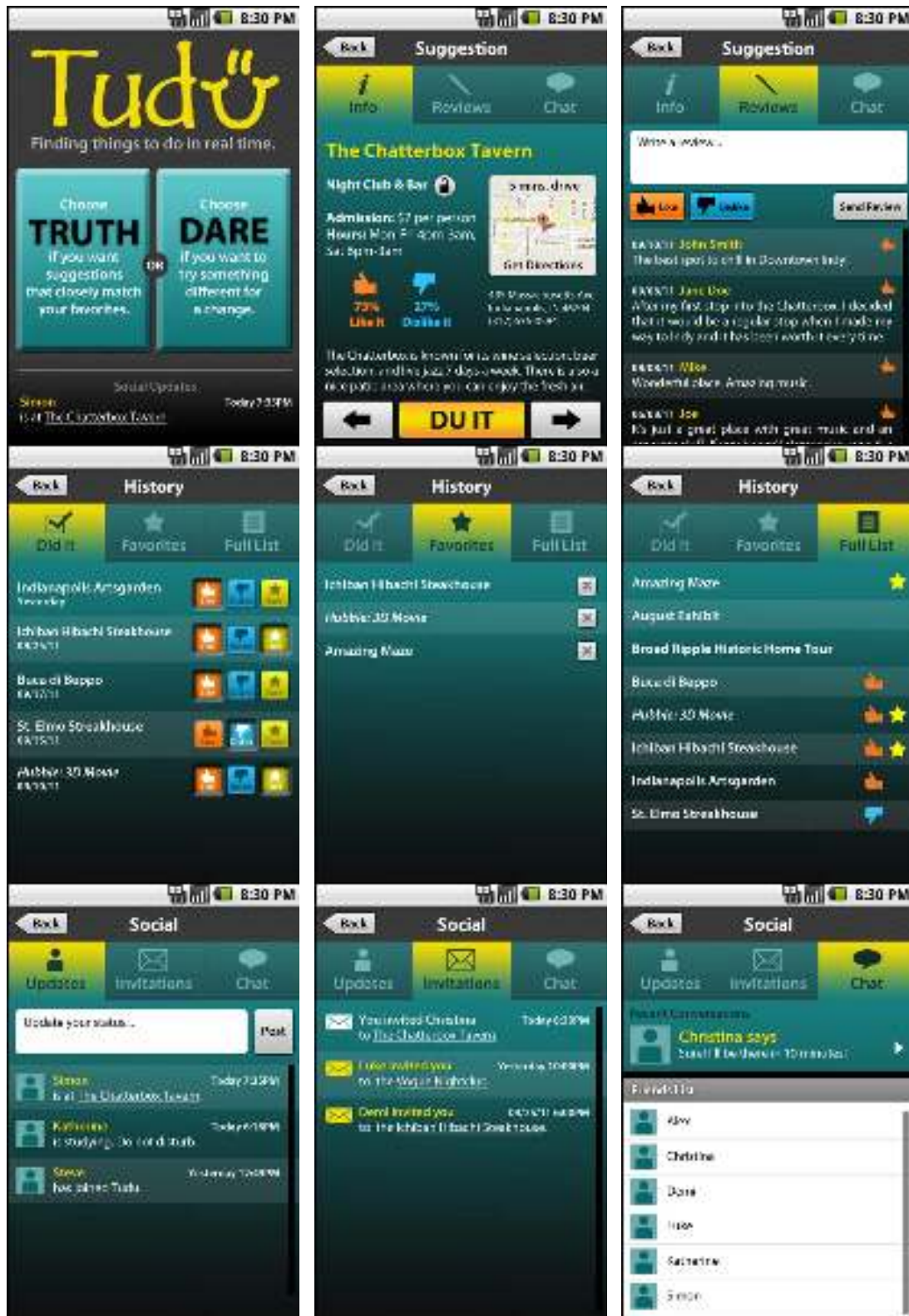
First Level- Main Pages featured on the Menu	
(Note: The Menu is accessible by clicking the Menu button on the Android device.)	
<b>Home Page</b>	The home page (or suggestion page) is where the user must select the type of suggestion that they would like to receive. They have the option to select the "Truth" or the "Dare" randomizer. Users can return to the Home page from any place in the application by selecting it from the Menu. Also, the bottom area of the home page displays a feed of the user's friend's updates. They can click on an update to move to the Social page.
<b>Suggestion Page</b>	Once a selection has been made the user will be presented with a suggestion in the Suggestion page, which features three tabs: Info, Reviews, and Chat. Users can navigate between the tabs to get information on the suggestion, write a review, and communicate with friends. On the Suggestion page the user can select "Du It" to add the suggestion to their history where they can later rate the suggestion. Users can also hit the left arrow or right arrow at the bottom of the Suggestion page to return to a previous suggestion or skip to the next suggestion. Users can get to the Suggestion page by choosing "Truth" or "Dare" from the Home Page, by clicking on the name of an activity, or by clicking the Back button until they reach the last suggested activity.
<b>Social Page</b>	At any time a user may communicate with their friends, see what friends are doing, and view their invitations to activities by visiting the Social page. The Social page features three tabs: Updates, Invitations, and Chat. The Social page can be accessed at any time by selecting it from the Menu.
<b>History Page</b>	Tudu remembers the things a user likes to do by keeping track. In the History page users can see their past suggestions and how they have rated them. The History page features three tabs: Did It, Favorites, and Full List. The History page can be accessed from the other main pages by selecting it from the Menu.
<b>Settings Page</b>	The Settings page can be found by selecting it from the Menu. The Settings page features three tabs: Account, Interests, and Application. Each tab allows the user to modify important information in regard to the specified area.

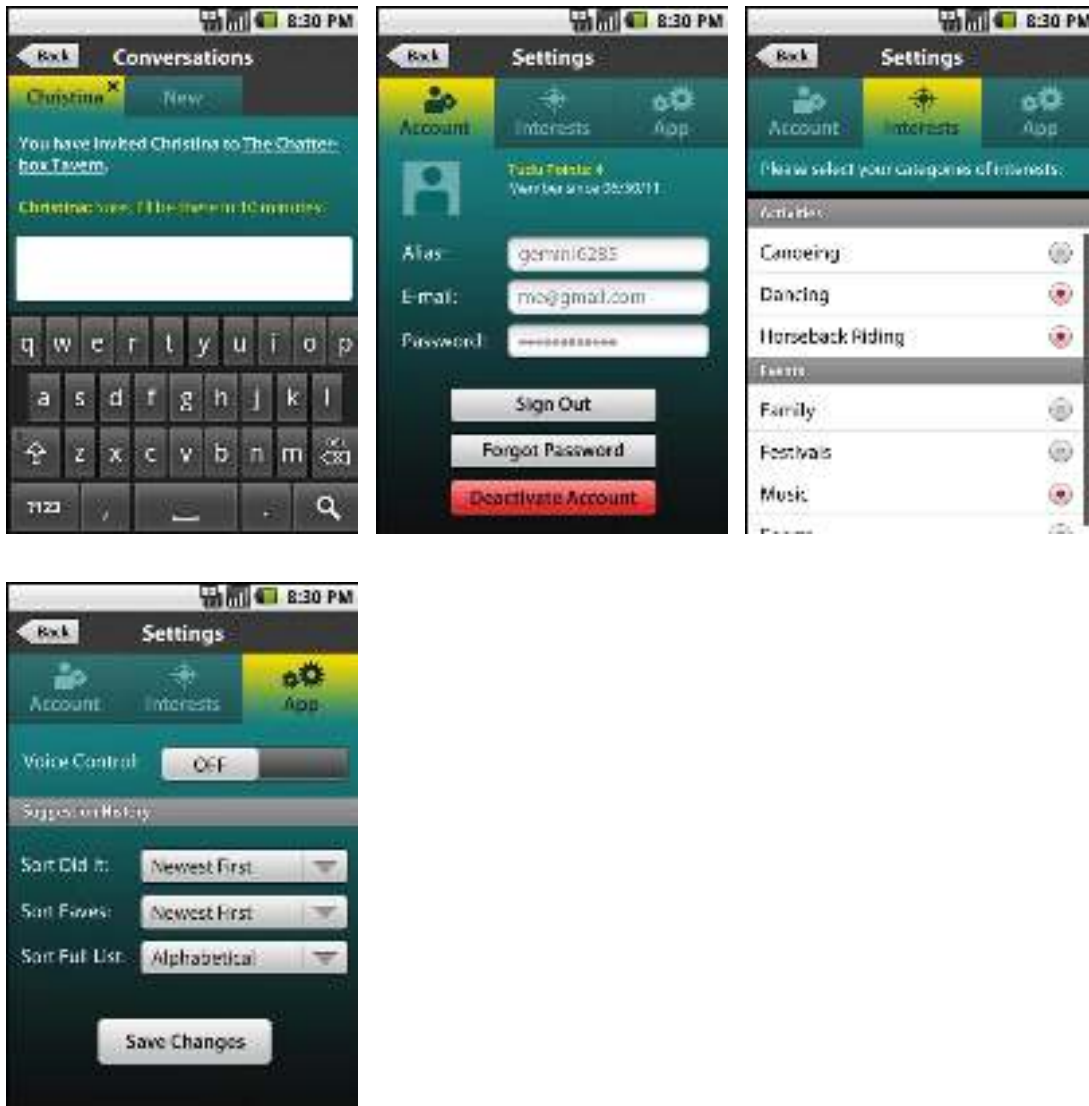
Second Level- Tabs within the Main Pages	
<b>Suggestion Page Tab 1</b>	<b>Info-</b> The Info tab gives a short description of the suggestion and lists the venue information, date/time/hours of operation, and ratings of the suggestion. The Info tab also displays a map for the suggestion and button for directions, which will

	connect the user's GPS on their Android Phone to get directions in Tudu.
<b>Suggestion Page Tab 2</b>	<b>Reviews-</b> The Reviews tab lists reviews of the suggestion by date. Users see a "thumbs up" or a "thumbs down" displayed by the users review to quickly navigate through the good versus bad reviews.
<b>Suggestion Page Tab 3</b>	<b>Chat-</b> The Chat tab is featured on the Suggestion page, so that users can quickly connect to friends if they have a suggestion that they may want to do with friends. The Chat tab has recent conversations and friends list displayed. Users can click on a recent conversation or start a new conversation by clicking on the name of a friend.
<b>Social Page Tab 1</b>	<b>Updates-</b> The Updates tabs lists the status updates for friends by date/time. The user can also modify their status in the top area of the Updates tab.
<b>Social Page Tab 2</b>	<b>Invitations-</b> The Invitations tab is where users will see their current list of invitations for things to do from friends.
<b>Social Page Tab 3</b>	<b>Chat-</b> The Chat tab lists recent conversations followed by the friend list in alphabetical order. Users can engage in a recent conversation or start a new conversation. Once in the conversation the user will see tabs for the friends they are chatting with. Multiple chats can occur by using the tabs inside of conversation. Also, the user can easily navigate back to the main Chat Tab.
<b>History Page Tab 1</b>	<b>Did It-</b> The Did It Tab displays all of the recent suggestions for which the user selected "Du It". Beside each suggestion there are three icons: a star, thumbs up, and thumbs down to denote favorite, like, or dislike. The user can view their ratings on recent items or can select an icon to rate a suggestion that has not yet received a rating.
<b>History Page Tab 2</b>	<b>Favorites-</b> The Favorites Tab lists all of the suggestions that have received stars or that were selected by using "Add to Favorites" on the Menu. There is an "X" icon displayed next to each favorite should the user need to remove a favorite.
<b>History Page Tab 3</b>	<b>Full List-</b> The Full List Tab displays an alphabetized list of all the past suggestions that the user has received and how they have been rated.
<b>Settings Page Tab 1</b>	<b>Account-</b> The Account Tab allows the user to recover lost passwords via their email, deactivate their Tudu account temporarily, and to edit their alias or Tudu Screen Name.
<b>Settings Page Tab 2</b>	<b>Interests-</b> The Interests Tab allows users to modify the types of activities, such as events, restaurants, and venues they prefer. They uncheck and check beside the various types of interests to modify the suggestions that they will receive in Tudu.
<b>Settings Page Tab 3</b>	<b>Application-</b> The Application Tab is where the user can select or deselect the voice control or hands-free feature of Tudu. Also, the user can choose how they would like their suggestions on the History page to be sorted (alphabetically or by date).



## C. Low Fidelity Prototypes





## D. Usability Study Results Tables

Summarized comments and exact quotes from the six participants of the usability tests and one expert user of the internal walkthrough are outlined in the three tables below.

**Table 1: Usability Testing Data (Part 1)**

Demographic Data			
Age	35	39	24
Gender	Male	Male	Female
Highest Level of Education	Master's Degree	grad school	bachelor's degree
Work Experience	HCI Intern	asst professor	designer
Computer/Technical Skills	Advanced	teach digital media college classes	efficient

Warm-up Questions			
Do you currently use any mobile applications?	yes, several	yes	yes
Do you have a current favorite mobile app to connect with your friends?	no social networking is not for me unless you count texting	I use very few Apps; I prefer web-based systems	Facebook, Twitter
Do you have an application that you use to bookmark activities that are of interest to you?	meetup.com	delicious	no
Main Session Questions			
What were your initial impressions?	Silly name. I like the pun of truth or dare. I dare!	I don't understand the text on the opening screen. I'm not sure what I'm supposed to do, so I ended up just clicking around	It reminded me of the app UrbanSpoon, except it offers more than restaurants.
Did you like anything about it? If yes, what?	Nice design, easy to read. However smart phones are not that big.	The review section was easy and I liked the design. it was definitely easy on the eyes	I liked the Truth or Dare option.
Did you have any difficulties? If yes, what?	I do not know what I have done. Does liking something add it to my favorites? Where are my favorites?	The learnability wasn't there for me. I couldn't figure out what I was doing	How does "Truth" first determine suggestions? Will there be an initial set up screen where someone can check interests such as art, music, nightlife, etc?
What was your overall experience while attempting the tasks?	I got a little lost. But hey it's my first time.	It wasn't intuitive to me what I was supposed to do; the language wasn't based on a literacy I'm used to seeing so I wasn't sure what I was supposed to do	I think this is a great app. Good for those who are indecisive.
Additional Comments	What is up with the informed consent? That is not part of the assignment. Do really need it?	Is chat instant messaging my friends? Those are generally thought of differently. could not figure out how to add a suggestion to favorites	n/a
Cool-off Questions			
Would you use Tudu?	No. I am not the target audience. Social networking features are not for me. Although knowing what friends like in restaurants/museums instead of strangers sound better and more personal. As a restaurant guide Yelp already own the market and I barely use that app. For chatting why would I use a proprietary app for that?? I am already overwhelmed on ways people can contact me. Text messaging is better or the other forms of communication already in-placed..	It's a more social Yelp, definitely.	I think I would. Especially on days when I'm feeling like getting out but don't know what to do.
What do you think would make this app user friendly?	Funny truth or dare pun. Simple buttons.	The learnability needs to be addressed; I would run a nomenclature exercise where you asked people to come up with what terms THEY would use to identify what you are trying to do.	Maybe an intro/tutorial in the beginning where it explains how to use the app and where a user can choose interests.

**Table 2: Usability Testing Data (Part 2)**

Demographic Data			
Age	25	24	22
Gender	Female	Male	Male
Highest Level of Education	Bachelor's Degree	High School	Bachelor's Degree
Work Experience	Customer Service Specialist	Student	Warehouse employee
Computer/Technical Skills	Internet, word processor	Advanced	Advanced
Warm-up Questions			
Do you currently use any mobile applications?	yes	Yes	No
Do you have a current favorite mobile app to connect with your friends?	yes - Facebook	Facebook, SMS	Facebook
Do you have an application that you use to bookmark activities that are of interest to you?	No	No	No
Main Session Questions			
What were your initial impressions?	I like the Chat feature.	--The social aspect feels like a rehash of Facebook or options that are already on the phone (SMS) and superfluous	--I'm more used to iOS with only 1 button and the "Menu" button is not intuitive for me.
Did you like anything about it? If yes, what?	--Chat tab is accessible in different pages. --I like that you have the social screens to be able to connect with friends, it's faster than having to call them. --Having Like, Dislike, Fave an activity instead of forcing to write a review. --I like the random suggestions, reviews.	--Like the ability to "favorite" things and come back to them later. --Seems well laid out.	--The idea to "lock" categories is a nice touch.
Did you have any difficulties? If yes, what?	--"Add Suggestion to Favorites" menu option is easy to miss. --Didn't understand "DU IT" was for."	--Had problems identifying where to go for Category Filter. Would have disabled options in "Interests". (Suggested making category on "Info" page clickable, linking it then to the category filter. --Inability to turn off location and manually enter an address."	--Had problems identifying how to get "Home". Thought "back" (the back in the upper right) should be replaced by ""home"" as he did not feel he was ever at a point where he needed "back". --Problems identifying ""category filter"". Would go to the ""interests"" menu and set options there."
What was your overall experience while attempting the tasks?	--I like the chat. -- It's not hard to maneuver through as long as you've had time to experience it for a period of time or if you're an experienced Android user. -- I see "Menu" as almost like a help screen. -- It seems user friendly. It's interesting being able to connect with friends. --It's an interesting product	--Feels like the "menu" button is being used for too much. I expect to see only "settings" related selections when using it.	"--I would like to see the ability to ""group chat"". This would make organizing meetups easier. --What about people who don't use Tudu? I want to be able to invite my friends who may not have the application without necessarily requiring they install the software. Being able to send an SMS through Tudu would help me do this."

	concept.		
Additional Comments	<p>Recommendations:</p> <p>--Info tab: I want more information about the suggestion: pictures, link to website ...instead of just basic info.</p> <p>--Info tab: Provide ""Add to Favorite"" button. I like seeing the option immediately.</p> <p>--Chat tab: Should be "Social" things all in one tab.</p> <p>--Suggestion page: I want everything in Suggestion (settings, social)</p> <p>--Social: "Add Friends" should be more visible.</p>	<p>--Felt 'chat' feature was superfluous.</p> <p>--Didn't care for color scheme.</p> <p>--Suggested making "Social Updates" is on home page not just auto scrolling, but being able to manually scroll them as well.</p> <p>--Truth and Dare seem too similar stylistically. While there is a word in the upper right signifying where you are, it does not seem enough."</p>	n/a
<b>Cool-off Questions</b>			
Would you use Tudu?	If it's free, I'll use it.	--Seems like a good idea, but it all comes down to content. If it can provide relevant suggestions on what I might like to do, the application would most definitely be something I would use.	--Seems like a good idea, but it all comes down to content. If it can provide relevant suggestions on what I might like to do, the application would most definitely be something I would use.
What do you think would make this app user friendly?	More options on one screen. I want it to flow better, more seamless.	n/a	

**Table 3: Internal Walkthrough Data**

Questions	Rating	Why?	Recommendations for Improvement
<b>1. How easy is it to get a suggestion?</b>	<p>Very easy</p> <p><b>Somewhat easy</b></p> <p>Neutral</p> <p>Somewhat difficult</p> <p>Very difficult</p>	It takes a single click from the home page to achieve this. This seems quite easy. Only reason I would not rate it "Very Easy" is on the off chance that the user does not care whether it's a Truth or Dare and therefore is forced into making a decision they may not otherwise care for.	Only fix to make it "Very Easy" would make a single option, but Truth and Dare seem fairly popular and the cure would be fix would likely be worse than the problem.
<b>2. How informative is the suggestion information?</b>	<p><b>Very informative</b></p> <p>Somewhat informative</p> <p>Neutral</p> <p>Somewhat uninformative</p> <p>Very uninformative</p>	It seems like most major information about a venue/event can be found on this Info page. I honestly can't think of much more we could include. Perhaps pictures, but that seems like overkill, especially given the fact that this is a mobile application and adding images would not only make the pages much larger, but also significantly increase the load time, the opposite of what we want for our spontaneity.	None.
<b>3. How useful is the "Invite Friends" feature?</b>	<p>Very useful</p> <p>Somewhat useful</p> <p><b>Neutral</b></p> <p>Somewhat useless</p> <p>Very useless</p>	In its current state, only useful for those friends who use Tudu. Invitations coming from "Du It" and nowhere else is not all that intuitive.	Though I know I fought against it, being able to SMS through Tudu seems like a feature that could easily remedy this. Adding a small signature at the end (which the user can turn off, should they so desire) mentioning that it was sent through Tudu (maybe even

			possibly an app store link) could act as our invitation to the app itself.
<b>4. How easy is it to write a review for an activity?</b>	Very easy <b>Somewhat easy</b> Neutral Somewhat difficult Very difficult	It is easy to write a review when I am on the page itself. However, tracking down the page is not always the easiest of tasks. It's 4 clicks away from the home screen, which is getting pretty far out there. (Menu, Suggestion History, Venue Page, Review Tab...5 clicks if we count clicking in the "review" box).	Put a link to the Suggestion History directly on the home screen. This would get rid of one of the clicks. I guess it would be possible to put a "review" button directly at the "Suggestion History" page, but I think that would start to be too crowded.
<b>5. How easy is it to rate an activity?</b>	Very easy <b>Somewhat easy</b> Neutral Somewhat difficult Very difficult	In much the same spirit as writing a review, probably one click further away than it really needs to be. However, apart from that, rating an activity is incredibly easy to do once one has reached the "Suggestion History". Having the buttons directly by the entry in the history is very convenient.	See Question #4 (link to "Suggestion History" directly on home screen)
<b>6. How useful is the "Friend Updates" feature?</b>	Very useful Somewhat useful Neutral <b>Somewhat useless</b> Very useless	People who use our app are likely to already have other things (i.e. Facebook) that they use to keep track on their friend's statuses. While it is nice to not have to leave the application, I think we should assume that people are going to be hard pressed to give up Facebook/Twitter as their updating mechanisms.	"Modes" might be better. Short, standardized messages that people can select to let friends know to contact them to do something, not just another FB feed.
<b>7. How easy is it to navigate within the app?</b>	Very easy <b>Somewhat easy</b> Neutral Somewhat difficult Very difficult	Getting back to the home page should take a single click. Other than that, I don't feel we're ever too deep in the app to get lost.	We've already talked about replacing the "back" button in the upper left with "home". That could fix it right up.
<b>8. How useful are the menu options for each page?</b>	<b>Very useful</b> Somewhat useful Neutral Somewhat useless Very useless	We have lots of stuff in the menus. Maybe too much. Moving "home" to the main screen will be good because we can take the size down slightly.	Menus might need to be pruned, or at least made a bit more consistent. Especially since they are invisible until the menu button is pressed, having different menu screens at each page is a good way to confuse users.
<b>9. How intuitive/understandable are the buttons, labels, icons, and links?</b>	Very intuitive <b>Somewhat intuitive</b> Neutral Somewhat unintuitive Very unintuitive	90% of the menus seem intuitive and understandable. The "Du It" button though is not so self explanatory and the icons for voting being on both the Info and Review tabs can get a bit confusing.	Consider removing "Du It". The features of this button could be moved to other places in the application, often with more intuitiveness. Put the up/down vote on the rating page solely.
<b>Other comments/recommendations for improvement:</b>			Inviting friends should be with check boxes. The selectable circles look too much like radio buttons and may inadvertently imply that only a single person can be invited.



## E. Revised Interactive Prototype Screenshots

