

## **Group 6**

### Milestone 4 - Evaluation

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CPSC 4140

## Predictive Evaluation

For the predictive evaluation, we performed GOMS predictions for the five tasks we asked users to perform in their think aloud evaluations. We selected these tasks over others because these tasks are what an average user may be expected to perform within the website during a given interaction. These tasks are also related to the overarching aspects of the website (social, progress, goals, information sharing) and therefore are a good representation of the use of the system. Each GOMS prediction is listed below.

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### GOMS for Checking Running Progress

Goal: Locate graph showing running progress

Operators: Realize progress is on Motivation and Goals Tabs, navigate to one or the other, locate specified graph.

Methods: Click on Motivation Tab, click on Goal's progress tile OR click on Goals tab, scroll down

Selection Rules: If no knowledge of the graph being shown behind tile, will not select Motivation Tab method. Otherwise, 50% chance of selecting either or. If already on Motivation tab, more likely to use that method.

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### GOMS for Setting a New Goal

Goal: Set a new goal for fitness

Operators: Realize that the goals are under "Motivation", locate the add button, find the textbox

Methods: Click on Motivation, click the add button, type in their new goal and click Check

Selection Rules: only one way of accomplishing this task

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### GOMS for Finding the "How to lose and maintain weight loss" Article

Goal: Find the Correct article and press the like button

Operators: Realizing where you can find articles, searching for appropriate article once the list is found, clicking the like button beside it

Methods: Navigating to the Interests Page. Locate the correct Article Group. Scan the list for the Appropriate article. Press the like button next to that article.

Selection Rules: Only one way to accomplish task

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GOMS for Adding an Event that happens in Anderson

Goal: Joining an event that is happening in your area

Operators: Realizing that this information is under Events, scanning a list of events for those in a certain city, realizing the add button joins the event, clicking

Methods: Navigate to the people's tab, scan the list for the event in Anderson, click the icon in the event

Selection Rules: Only one way to accomplish this task

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GOMS for Adding Kevin Price as a Friend

Goal: Add Kevin Price to my Friends List

Operators: Realizing that the People's Tab is where you add Friends. Realizing which list is for "friends" and which list represents others that are not yet "friends." Scanning said list for a particular name. Realizing the icon displayed is meant for adding that person. Clicking, scrolling.

Methods: Navigate to the People Page. Scan the list on the People Near You side until the designated person is found. Click the icon beside their name.

Selection Rules: Only one way to accomplish this task.

## Heuristic Evaluation

### Protocol

#### Environment

- Location: McAdams student lab
- Device: Mid-2015 MacBook Pro with 15" Retina Display with 3DTouch trackpad and "natural scrolling"
- Browser: Google Chrome v57
- Note-taking Method: Google Sheets

#### Steps

1. Provide a General Overview <sup>1</sup> of the system to participant
2. Provide a template Heuristic Eval Google Sheet <sup>2</sup> to participant
3. Build and run application
4. Open application in a new browser window and maximize

5. Put application window and note-taking window on adjacent “Desktops” (Mac Software desktop) so the user can swipe back and forth between the two. This is for ease of use.
6. Leave evaluator to conduct Heuristic Evaluation using the Ten Heuristics<sup>3</sup>
7. Compile the results in Heuristic Evaluations<sup>8</sup> and analyze data

## Participants

### Breakdown

Participant	Age	Gender	Qualification for H.E.
A	21	M	Taking CPSC 4140 w/ Plaue
B	21	M	Taking CPSC 4140 w/ Plaue
C	20	M	Taking CPSC 4140 w/ Plaue
D	22	F	Taking CPSC 4140 w/ Babu
E	20	M	CPSC student w/ lots of front-end web development experience. Never actually done a H.E. before but we explained it to him beforehand and will take his results with that into consideration.

### Justification

Originally, our plan was to conduct the Heuristic Evaluation with only 3 participants: A, B, and C; however, we decided to conduct two additional Heuristic Evaluations (D and E) for two reasons:

1. Heuristic Evaluations are a less expensive solution (than user testing) to finding major flaws in the system, and since our prototype is in such an early development phase (and still has lots of major flaws), we believe heuristic feedback would be more efficient for finding the flaws in our system.
2. The evaluations we received from participants A, B, and C varied a good bit, meaning there wasn't much overlap in noticeable flaws. With this, we pursued the concept of diminishing returns; because there wasn't much overlap in the feedback, we decided assumed that there were other flaws that still needed to be addressed. With all 5 Heuristic Evaluations, there was significant overlap to end evaluations.

## Results

### Major Flaws

#### Visibility of system Status

- No confirmation of edits in settings being saved for setting changes
- No content on landing page
- When user adds interests there are no visible changes
- Couldn't see new goal button

#### Help and Documentation

- No help or user guides
- Adding friends is not very clear/easy
- It is unclear on how to enter new progress

#### Recognition, not recall

- Interest icon confusing

#### Consistency and Standards

- Unclear that you can click on red and green tiles on home page
- Unclear how the progress page is related to the goals
- Events in the events tab are not ordered chronologically
- Search bar doesn't work
- Unclear how to go back to motivation page after clicking on one of the tiles
- Clicking on the navigation icons navigates correctly, but doesn't update the sidebar

#### Match between system and the real world

- No clear way to enter progress
- What does "People near you" mean?

#### Aesthetic and Minimalist design

- Cluttered main dashboard
- No content on landing page

#### Help user recognize

- Calendar icon shows nearby events instead of upcoming events

### Flexibility and Efficiency of use

- Not responsive for mobile
- Entering new progress was unclear
- No real-time breakdown of progress

### Analysis

The biggest flaw identified by 3 out of 5 of the evaluators was the lack of clarity there was regarding entering progress and its relation with the goals. Three evaluators also felt that the motivation page, which serves as the main dashboard, was too cluttered. Two of the evaluators pointed out a problem with the main page not displaying anything before you the user selects a tab. Two evaluators found an issue where the sidebar navigation does not update correctly when you use the tiles on the motivation page for navigation. Two evaluators also felt that the events page should be able to be sorted chronologically. The other flaws were only reported by one of the five evaluators. These included: the non-functionality of the search bar, the inability for it to run properly on mobile devices, the lack of updating information when the settings tab is used, the lack of help and documentation, the lack of clear meaning of “people near you,” confusion regarding adding friends, the icon for adding goals being too small and hard to see, and finally the hidden functionality of the red and green tiles on the motivation page.

Three of these flaws were present because this was an early prototype of the system. These include the search bar functionality, the failure to save the settings options data, and the mobile portability. These are implementation goals for a future prototype. The other issues are definite issues with our design. These were taken into consideration along with the data gathered in the two user evaluations and synthesized below in the results section.

## Usability Benchmark Testing

### Protocol

#### Environment

- Location: Desk at Bryan’s Apartment
- Device: Mid-2015 MacBook Pro with 15” Retina Display with 3DTouch trackpad and “natural scrolling”
- Browser: Google Chrome v57
- Note-taking Method: Pencil and Paper
- Other Materials:
  - iPhone timer

## Steps

1. Provide a General Overview <sup>1</sup> of the system to participant
2. Read Privacy Script <sup>4</sup> to participant
3. Build and run application
4. Open application in a new browser window and maximize
5. Allow user to familiarize his/herself with the application for 3 minutes
6. Read Benchmark Script <sup>6</sup> to participant
7. Conduct each of the Ten Benchmark Tasks <sup>7</sup>
  - a. Reset the application to the landing page
  - b. Read the task aloud to the participant
  - c. Start timer
  - d. Jot down any errors the participant makes
    - i. Clicking wrong button
    - ii. Scrolling passed the target
    - iii. Failure to complete
    - iv. etc.
  - e. Stop timer when participant finishes task
    - i. Mark as “Incomplete” if user verbally admits they cannot complete
  - f. Have user rank the task’s difficulty on a scale of 1-4, where 4 is the most difficult
8. When all benchmark tasks are completed, have the user complete the Questionnaire

## Participants

### Breakdown

Participant	Age	Gender	Time Spent on Social Media per Day More than 4 hours, 3-4 hours, 2-3 hours, 1-2 hours, Less than 1 hour	Primary Form of Social Media
A	22	M	More than 4 hours	Facebook
B	23	M	Less than 1 hour	Facebook
C	20	F	More than 4 hours	Instagram
D	22	M	1-2 hours	Reddit
E	21	M	1-2 hours	Reddit

### Justification

For usability testing, it’s important to find participants who are within the target demographic. Going back to our second milestone, in which we were admittedly unclear, our target

demographic is any user who is seeking a means for motivation to a healthier lifestyle. Ideally, our benchmark test participants should sample this demographic randomly and widely, but given our location (college campus) and our acquaintances (other college students), this was not really the case; however, our participants do vary in current social media usage, which will help us to understand familiarity of our social media platform with others.

## Tasks

1. Join an upcoming 5k run event
  - Goal: 80% of participants will complete this task within 10 seconds and with no errors or minor errors only
  - Justification: There are two different ways to quickly join an event and all events are clearly labeled
2. Add Bryan Pyle as a friend
  - Goal: 80% of participants will complete this task within 15 seconds and with no errors or minor errors only
  - Justification: The people tab should be quickly recognizable as a place to add friends, and the only options on the “People” tab are to add and remove people from your list. We gave the user an additional 5 seconds because it may be difficult to find “Bryan Pyle” in the list of users.
3. Add an Interest for Trail Running
  - Goal: 80% of participants will complete this task within 30 seconds with minor errors
  - Justification: It shouldn’t be too easy to edit the user’s interest (i.e. one-click could be destructive). The edit icon next to the “Interests” header should be a clear indication of a way to add or remove an Interest, but it requires the user to search for it.
4. Add a Long Term Weight Goal
  - Goal: 80% of participants will complete this task within 20 seconds with minor errors
  - Justification: There is only one place to add Long Term goals, but it is clearly labeled under the Goals tab so should be easy to find.
5. Check Monthly Running Progress
  - Goal: 80% of participants will complete this task within 10 seconds with minor errors
  - Justification: The monthly progress for running is on the home page. The user should recognize the “Progress” card on the homepage to quickly find it.
6. Enter body weight
  - Goal: 80% of participants will complete this task within 10 seconds with minor errors
  - Justification: There are two places to enter body weight, one is on the main page, the other is on the Goals page. Since there is no implemented functionality for



entering weight, the user just needs to click the checkbox for the “Enter Body Weight” daily task.

7. Like an article related to cardio
  - Goal: 80% of participants will complete this task within 10 seconds with minor errors
  - Justification: There are two places to find cardio related articles: on the main page and on the interests page. The user just needs to select the like icon next to the article.
8. Check what the newest post is in the “Clemson Running” group
  - Goal: 80% of participants will complete this task within 10 seconds with minor errors
  - Justification: It should be fairly intuitive that the Groups page will show recent posts for groups of the user. Each group is clearly labeled so it should be a pretty easy find.
9. Remove a daily task and add a new one
  - Goal: 80% of participants will complete this task within 30 seconds with minor errors
  - Justification: Daily Tasks are located in two places on the application: Motivation and Goals. It should therefore be fairly easy to find where to edit the tasks. The trashcan icon next to each task should clearly indicate removal, while the giant plus button and input combination should indicate a place to enter a new goal.
10. Change your name
  - Goal: 80% of participants will complete this task within 15 seconds with minor errors
  - Justification: “Settings” should be a clear indication that the user can manage their account settings. From there they can quickly find and change the name input.

### Justification for Tasks

Currently our prototype is a skeleton. There is a lot of structure, but there isn't really a lot of functionality. This limited us to testing more of the structural elements of the platform instead of a lot of the extra functionality. Taking that into consideration, we wanted to complete tasks that were fundamental to the purpose of this website, such as adding interests, goals, or even friends.

## Results and Analysis

### A Quick Note About Times

Our goals for the benchmark tasks specified certain times; however, these times were heuristically based on some quick trials that our team members did beforehand. We did not account for many errors that our participants revealed (many of which hindered the participant entirely from completing the task). Because of these errors, many of the completion times were

far higher than our predictions or inconclusive due to incompletions, so we have decided that the best way to analyze our benchmark analysis is through the user-rated difficulty and the severity of errors for each task. If you would like to still see the average time per task, you can find them in the Appendix under [Benchmark Test Times](#).

A Quick Note About Errors

In the benchmark evaluation, we recorded the errors made by the participants for each tasks based on the following scale:

- No Errors: the participant had no misclicks or hesitations/confusions
- Minor Errors: the participant navigated to the correct page but then hesitated on finding the target or the participant had a misclick that DID NOT reroute the page
- Major Errors: the participant had misclicks that navigated to incorrect pages or performed an unnecessary task
- Incomplete: user verbally admitted they were unable to complete the task due to confusion/errors

Charts and Tables



## Analysis

The results visualized above have allowed us to pinpoint some major and minor flaws with our prototype. As a general rule of thumb when analyzing the above visualizations, red is bad, yellow is neutral, and green is good. The benchmarks that appear to have the most difficulty were:

3. Add an Interest for Trail Running
5. Check Monthly Running Progress
6. Enter Body Weight
10. Change your name

It is apparent that tasks 3 and 5 were both error-prone and more difficult than they should be, while tasks 6 and 10 had some unexpected errors. Below, we have listed each task with some possible reasons for errors and difficulty as well as some potential solutions:

Task: Add an Interest for Trail Running

Reasons for difficulty:

- Participant is uncertain of what an “Interest” is
- Participant did not notice the “edit” icon next to the header
- Participant looks for “+” icon when they want to “add” something

Potential solutions:

- List out all interests at top, similar to reddit. Remove the need to click a button to change Interests
- Put a delete icon on each current Interest, and change the current “edit” icon to an “add” icon. This way both options (remove and add) are clearly indicated.

Task: Check Monthly Running Progress

Reasons for difficulty:

- Participant expects best source for progress to be on “Goals” page
- Participant doesn’t notice Progress card on Motivation page

Potential solutions:

- Include the Weekly/Monthly/Yearly breakdown of progress from the Motivation page on the Goals page

Task: Enter Body Weight

Reasons for difficulty:

- Checkbox is not an intuitive indicator for data entry

Potential solutions:

- Use a button that says “Enter Body Weight” either on the Motivation page or the Goals Page.
- Create a button that allows the user to enter their progress for a particular goal

Task: Change Your Name

Reasons for difficulty:

- Other social media platforms make you click on the user box to edit profile

Potential solutions:

- Make it so clicking in the user box also opens the settings dialog.
- Change “Settings” to “Account”

## Think-aloud evaluation

### Protocol

#### Environment

- Location: Various private space settings, i.e. apartment of participants, apartment of evaluator, etc.
- Device: Various devices, i.e. Dell Precision M4700 with trackpad and Windows 10, Dell Latitude E7440 with trackpad and Windows 10
- Browser: Google Chrome v57
- Note-taking Method: Video Recording

#### Steps

1. Provide a General Overview<sup>1</sup> of the system to participant
2. Read Privacy Script<sup>4</sup> to participant
3. Build and run application
4. Open application in browser
5. Read Think Aloud Script<sup>5</sup>
6. Record responses by video
7. Let the user explore the application for three to five minutes
8. Give the user tasks to perform
9. Provide a questionnaire to the participant
10. Compile the results and analyze

#### Tasks

The tasks we selected for the think-aloud evaluation were as follows:

1. Talk through Checking Your Running Progress
2. Talk through setting a new goal

3. Find the “How to lose and maintain weight loss” Article
4. Find an Event that happens in Anderson, SC. What day does it take place?
5. Find and add Kevin Price as a friend.

## Participants

### Breakdown

Participant	Age	Gender	Occupation
A	21	F	Electrical Engineering Student
B	26	M	National Guard Communications
C	24	M	Computer Science student
D	25	M	DPA Student
E	20	M	Architecture Student

### Justification

As a separate usability test, this method was constrained by the same restrictions we found in the benchmarking tests regarding demographics. But the participants do represent a wide field of majors and therefore viewpoints for this platform. We wanted to give each participant a three to five minute free exploration period so that we could capture their thoughts on the overall interface itself. We selected the tasks above over other tasks because these tasks are what an average user may be expected to perform within the website during a given interaction. These tasks are also related to the overarching aspects of the website (social, progress, goals, information sharing) and therefore are a good representation of the use of the system.

### Results

A had:

- Ability to customize motivation page
- Search Bar not visible enough, also doesn't work
- Unclear how to enter body weight
- Couldn't like the group feed likes
- Should keep progress of goals achieved
- Not sure what graphs are saying (no axes)

B had:

- Clicking on Progress Tile on Motivation page brought user to top of goals page instead of bottom
- Not sure what groups are

C had:

- Why was the middle graph a bar graph
- Bigger graphs had no axes
- Confused about meaning of background colors (Goals progress)
- Settings dialog was its own box (Not a page)
- “Show more” did nothing
- Couldn’t interact with posts in Group feed
- Iconography not clear

D had:

- Motivation didn’t show long term goals
- Couldn’t do anything on Groups page
- Confused about graph type in relation to data

E had:

- Why is there so much empty space
- How do i see my notifications
- Can I make custom interests?
- How do I add friends that are not near me?
- Wanted to know who would be able to see profile picture
- Asked if you can direct message other users.

## Analysis

A common theme that the evaluations pointed out was the lack of meaning meaningful data being displayed by the graphs in either page relating to goal progress. This was further pointed out by the lack of axes on the larger version of the graphs. Another common theme was the lack of ability to interact with the Groups page. One participant was confused about the meaning of the icons used. The search bar was another issue. It was not very visible and it was non-functional. Another issue was a lack of consistency in one of our tiles on the the Motivation page. Three links led to their own pages, while Progress led to the Goals page. It was suggested that we make Progress its own page and possibly include all of the goals the user had achieved. It was also pointed out that you couldn’t see the profile of another person before you added them as a friend.

## Overall Results

Going through the feedback there are some things we implemented well, and some things we should have done better. The most persistent piece of feedback we received from our heuristic evaluations was that it was lacking clarity and consistency. These problems mainly

manifested on the Interests page and the Goals page. With the goals page, many participants had no idea how to enter their progress on this page. Many participants also experienced confusion regarding the graphs. There was also an issue with the settings option being a dialogue box instead of a page like the other tabs. These issues can be reconsidered going forward if we:

- 1) Implement a clear, well communicated way of entering progress such as current weight
- 2) Ensure the graphs communicate data effectively by providing axes and keys
- 3) Consider splitting the Goals page into a Goals page and separate Progress page
- 4) Maintain consistency when adding an interest by using the add icon
- 5) Implement the Options tab as a page instead of a dialogue box
- 6) Move the interests into the settings page

When looking through the benchmark testing we noticed that the hardest parts were adding interests, updating progress, and changing the name. The first two issues seem to reinforce what we learned in the heuristic evaluations and the last issue is due to a lack of functionality due to this being a prototype.

We saw from the feedback from the think alouds and the questionnaires that we did get several things right as well. Users found it very easy to navigate through the website with the tabbed menu on the left hand side. This is partially due to taking advantage of Fitt's Law by using the edge of the screen as well as keeping the menu bar consistent throughout the site. Users also thought it was really simple to join events and to add goals and we believe this was in part due to the material design choice we made which simplified the layout significantly.

We learned that there are some things we should focus on moving forward. We will aim to provide more feedback from the website so users will be more informed, such as making it clear that their changes to the user information have been made and making sure that the home page is the motivation as we originally intended. We can also clarify some of the icons so users know just what to expect, such as a plus icon for adding an interest instead of a small pencil icon beside the title of the page. Moving forward there will also be full implementation of the search bar so that will help a lot in making things easier to find.

## Appendix

### <sup>1</sup> General Overview Highlights

- Social Media Platform to motivate users towards their health goals
- Web Application built with Angular 2
- Only a prototype with minimal functionality
- Mostly interested in criticism of User Interface, but all criticism is welcome

- You are logged in as “John Doe” who has been using the system for some time and has already set up his account.

## <sup>2</sup>Heuristic Evaluation Google Sheet Template

#	Related Problems List the #s of any problems that are related	Priority of the problem 1-4, where 1= highest priority (huge flaw!)	Description of the problem A summary of the problem	Heuristic Violated The name of the heuristic that this problem violates	Potential solutions to the problem Hypothesize up to 3 solutions to the problem
1	none	2	sample	sample	sample

## <sup>3</sup>Ten Heuristics

1. Visibility of system status
2. Match between system and the real world
3. User control and freedom
4. Consistency and standards
5. Error prevention
6. Recognition rather than recall
7. Flexibility and efficiency of use
8. Aesthetic and minimalist design
9. Help users recognize, diagnose, and recover from errors
10. Help and documentation

## <sup>4</sup>Privacy Script

By partaking in this survey, you agree to the following terms. We will video record you during the session. The information we receive during the session will be used by us in evaluating our design. This information will be disclosed to our classmates as well as our professor. Your personal information during the session will not be disclosed to anyone but the testers. You are free to stop at any time during the evaluation. We will first give you several minutes to familiarize



yourself with the system, then we will ask you to perform specific tasks. At the end of this process, you will be asked to fill out a questionnaire. Would you like to continue?

[if participant says 'no', then stop the test]

## <sup>5</sup> Think Aloud Script

Please verbalize your thoughts as you use the system. You will be given a few minutes to explore the site, and then we will ask you to perform several tasks a user might perform on any given interaction. Please maintain verbalizing your thoughts throughout this process.

## <sup>6</sup> Benchmark Testing Script

Please familiarize yourself with the application for about 3 minutes. After this we will have you complete 10 different tasks we are curious about, and record the results. After each task I will need you to rank the task's difficulty on a scale of 1-4. Lastly there will be a questionnaire at the end of the benchmark testing for you to complete.

## <sup>7</sup> Benchmarking tasks

The tasks we selected for the benchmark evaluation were as follows:

1. Join an upcoming 5k run event (vs. Facebook)
2. Add Bryan Pyle as a friend (vs Facebook)
3. Add an Interest for Trail Running (vs Reddit)
4. Add a Long Term Weight Goal (vs MyFitnessPal)
5. Check Monthly Running Progress (vs MyFitnessPal)
6. Enter body weight (vs MyFitnessPal)
7. Like an article related to cardio (vs Facebook)
8. Check what the newest post is in the "Clemson Running" group (vs Facebook)
9. Remove a daily task and add a new one
10. Change your name (vs Facebook)

## <sup>8</sup> Heuristic Evaluations

[https://docs.google.com/a/g.clemson.edu/spreadsheets/d/1pl\\_YAc16DwPXrbikz2jXzT8G9liq-Lxl35ehJTJMGWk/edit?usp=sharing](https://docs.google.com/a/g.clemson.edu/spreadsheets/d/1pl_YAc16DwPXrbikz2jXzT8G9liq-Lxl35ehJTJMGWk/edit?usp=sharing)

## <sup>9</sup> Questionnaire

### Questionnaire Questions:

#### o Open-ended questions

1. What is the biggest issue you had with the motivation page?

Justification: Since the motivation page acts as our hub, we wanted to make sure it was as easy to use as possible.

2. Would you like some other representation of progress made?

Justification: Wanted to make sure we were presenting the data in an easy to understand manner.

3. What did you think about the color scheme? If you disliked it, what would you suggest?

Justification: We wanted to make sure the users found the site aesthetically pleasing as well as communicating the right messages to the user.

4. Is the information where you expected it to be? If not, what wasn't?

Justification: Wanted to make sure we organized the information in places that made sense to users.

#### o Closed questions

1. Is the process used for entering progress easy to use?

Justification: Since progress is one of the main sources of motivation on our site, we wanted to make sure users could easily make use of this feature.

2. Is it easy to identify action buttons?

Justification: Wanted to gauge if users were able to identify the action buttons in general since that's how they interact with the website.

3. Was it intuitive to add an interest?

Justification: A different method of adding an interest was used than the other pages. We wanted to make sure this method was still clear to users.

#### o Scalar questions

1. How useful are the graphs in letting you see and understand your progress?

Justification: Wanted to make sure we were presenting the data in an easy to understand manner.

2. On a scale of 1 to 5 [Severely Lacking, Not Quite Enough, Perfect Amount, Too Much, Overwhelming] how much information is on the motivation page?

Justification: Wanted to gauge users' perceptions of this page since it serves as the hub of our site. Did not want to overload user with too much information.

#### o Multi-choice question

1. Which of these aspects of this site is the most motivating to you

- a. Social aspects; working with groups and other people towards personal and common goals
- b. Receiving daily tasks to work towards goals

- c. Seeing visualizations of progress made (e.g. charts, graphs, etc)
- d. Finding events related to your goals and interests
- e. Finding articles related to your health interests

Justification: Find which area(s) we should focus our attention on in order to maximize site's motivational potential.

o Ranked question

1. Rank the subcategories "Groups, People, Events, Goals, Interests" in order of amount of time from most amount of time to least amount of time that you are likely to spend using them.

Justification: Used to determine what order the tabs should be in and which the users are most likely to use.