

Exercise and Nutrition Tracking Website
Final Report

December 1, 2005

Purpose of this document

This document will present the methods used to design an exercise and nutrition tracking application that is being implemented by Margaret Prisco, Mia Puzo, Mike Smith and Jason Narad. The methods presented include gathering user requirements, determining the program flow and designing the interface.

Process

The basis for the decision to design an exercise and nutrition tracking program was the SIGCHI 2006 student design contest requirements. The requirements stated:

“We invite student teams to design a service for personal monitoring of diet, exercise and health for individuals. Solutions need not, but could, address certain groups with specific health needs. Solutions could address educating consumers about processed and pre-packaged foods, or could address teaching children about diet and exercise. Alternatively students could address the needs of a sub-group suffering from some form of malnutrition.”¹

After much discussion, the decision was made to approach the problem with software that would be used for exercise and nutrition tracking. It was based on the belief that there is a need for the ability to keep track of how much exercise one is doing and how one progresses. It seemed a natural complement to the exercise theme to include a way to track nutritional needs and deficiencies. The target group would be people who already engaged in exercise regularly although it was hoped that this software could also aid anyone seeking to increase their amount and frequency of exercise and those with a desire to track and improve their nutritional intake.

Based on experience, it was thought that a web browser^{*} based application, rather than a native Windows application, would provide greater flexibility to the user. Consideration was given to the ability to run an add-on application on some sort of hand held device. This would require a system centralized server that could serve requests via cellular or some similar technology. See appendix A for project proposal.

User Requirements

The initial requirements were to be user driven via an anonymous questionnaire (appendix B). The required paperwork, along with the questionnaire was submitted to the Human Subject Committee on or about October 8, 2005 and received approval on October 22nd.

^{*} Note that the term “web browser based” is used to differentiate from a “web based” application which may or may not run in a browser. An example of a web based application is Google Earth, which runs from a small client program but gets its content from the web via hyper text transfer protocol (HTTP). The decision to run the application from a browser was deliberate.

The human subjects approval required consent forms to be signed prior to asking users to complete the surveys. Five hardcopy questionnaires were distributed and three web based responses were received. The hardcopies were distributed to the target group of regular exercisers.

The responses were compiled and the 16 functional questions were analyzed. These questions listed various functions and users were asked to rate their usefulness on a scale of one to five, where one was least useful and five was most. The following table contains the results of the survey.

Questions with an average rating greater than four were considered priority one. Those from three to four, priority two and all other priority three. See appendix B for a table prioritizing the results.

Each question/function was analyzed to determine if it was feasible to complete implementation within the allotted project time. This analysis influenced the decision regarding which items were included in the use case.

Use Case

Each of the functions was then used as a use case (appendix D). Similar functions were combined. Due to time constraints, the four lowest priority items were not included. Consideration was given to using the Volere template² but it was determined that the benefit would not justify the time, especially given the small size of the sample. The sample size also influenced the decision to concentrate on basic functions that would be more fully implemented while deferring the implementation of more complicated functions, regardless of priority.

Data Flow

Based on the overwhelming (88% or 7 out of 8) indication that a browser based program, or web site, would be preferable over a Windows based program, a dataflow was designed with the web in mind (appendix E).

Technical Decisions

The html was developed using Dreamweaver 8. A Tomcat web server hosts the jsp pages. The following software is being used to aid in development: JFreeChart, Batik 1.6 (for anti-aliased support of multiple image file types), Cavici's JSF wrapper on JFreeChart and the Jenia4Faces JSF component families.

Appendix A

Project Proposal**HCI Group Project**

Members:

- Mike Smith
- Mia Puzo
- Jason Narad
- Margaret Prisco

Topic: Fitness Tracker

- A system to help with tracking fitness.
 - User will be able to log daily exercise activities and monitor their progress over time.
 - User will be able to log daily dietary intake.
 - Provide user with helpful feedback.
- Primary user group: Health or fitness conscientious individuals.
- Subgroup:
 - Gym members.
 - Runners,walkers,joggers.
 - Home health enthusiasts.
 - Dieters.

Architecture:

- Implementation dependant upon user needs.
 - Web based.
 - Enabling user access from various locations at any time.
 - Allows users to interface from various devices.
 - PDA's, cell phone,etc..
 - Hosted on Oswego servers.
 - Software based.
 - Coded in java, portable across many operating systems.
 - Possible compatibility with PDA's, MP3 player's...

Schedule:

- User study completed 10/7.
- Prototypes completed 10/24.
- User evaluation 11/4.
- Design refinement 11/18.
- User testing 12/2.
- Deliverable 12/7.

Exercise Software Survey

We are designing an application to help track exercise progress and nutritional information. Please answer the following questions.

Gender: Male Female

Age: 16-25 26-40 41-55 56-70 71+

1) Do you do some sort of exercise? Yes No

If No skip to section 9 ~diet~ below

2) If so, how often do you exercise?

5 or more days a week

2-4 days a week

Once a week or less

3) What type of exercise do you do (check all that apply):

3a) Walk	<input type="checkbox"/>
3b) Run	<input type="checkbox"/>
3c) Bicycle	<input type="checkbox"/>
3d) Weights	<input type="checkbox"/>
3c) Aerobics	<input type="checkbox"/>
3d) Other (specify):	<input type="checkbox"/>

4)Where do you exercise (check all that apply):

4a) Home	<input type="checkbox"/>
4b) Outdoors	<input type="checkbox"/>
4c) Gym	<input type="checkbox"/>
4d) Other (specify):	<input type="checkbox"/>

Appendix B

The columns are the users. The rating is 1 is not useful at all and 5 is most useful. Note that early questionnaires had the scale reversed. It has been changed for consistency. Note too that early surveys did not have the final question. Blanks indicate N/A

User ->	1	2	3	4	5	6	7	8	Average
A list of exercises, their benefits, and instructions on how to do them, and the ability to add exercises not on the list	5	2	5	5	1	2	5	5	3.75
The ability to create exercise routines from these exercises	5	5	4	4	1	2	5	5	3.875
Scheduling workouts on a calendar	3	5	3	4	1	5	4	5	3.75
Reminders for missed exercises or days of exercise	4	5	5	4	1	4	5	5	4.125
Graphs or charts to show your exercise progress	4	4	2	2	4	5	5	5	3.875
Tracking the distance you walk/run/jog (entered manually)	5	3	5	5	1	5	5	5	4.25
Tracking the sets/reps/ and weight of applicable exercises	5	5	5	4	4	5	5	5	4.75
Tracking your diet, and pointing out ways to balance your diet, or vitamins you might need more or less of	4	2	3	4	1	5	2	5	3.25
Tracking calories burned per day/week/month	3	2	2	3	4	3		5	3.142857
Tracking calories consumed per day/week/month	3	2	2	5	1	5		5	3.285714
Tracking weight.	4	3	2	5	3	5		5	3.857143
Tracking BMI	2	3	2	2	1	5		5	2.857143
Tracking Bodyfat index	2	3	2	3	1	5		5	3
Tracking Body measurements	4	4	2	4	1	4		5	3.428571
Keeping track of your heart-rate before, during, and after exercise (entered manually)	3	4	4	4	1	5		5	3.714286
Tracking scores on sports or games you participate in		4	1	3	1	5		5	3.166667

Final Project Report

HCI500

A free-writing section to store information not supported for in the program		4	3	2	1	5		5	3.333333
The ability to compare your progress against others?						3		5	
	3.733333	3.529412	3.058824	3.705882	1.647059	4.333333	4.5	5	4

gender	F	M	F	M	F	F	F	M
age group	26-40	41-55	41-55	26-40	26-40	18-25	18-25	18-25
Do you do some sort of exercise?	yes	yes	yes	yes	yes	yes	yes	yes
How often?	once	2 to 4	2 to 4	2 to 4	2 to 4	5 +	2 to 4	5 +
walk		X		X	X	X	X	X
run		X		X	X	X		X
bicycle		X	X			X		X
weights		X	X	X		X		X
aerobics			X				X	
Other	dance			tennis	tennis			
Where:								
home	X			X	X	X	X	
outdoors				X	X	X		X
gym		X	X				X	X
other								
Prefer								
web based	X	X	X		X	X	X	X
PC				X				
device								
cell phone	X							
mp3		X	X		X	X		X
pda						X		X
like to track exercise?	No	Yes	No	No	No	Yes	No	Yes

Appendix C

Priority 1 functions - average rating between four and five:

- 1.1 Reminders for missed exercises or days of exercise
- 1.2 Tracking the distance you walk/run/jog (entered manually)
- 1.3 Tracking the sets/reps/ and weight of applicable exercises

Priority 2 functions - average between 3 and 4

- 2.1 A list of exercises, their benefits, and instructions on how to do them, and the ability to add exercises not on the list
- 2.2 The ability to create exercise routines from these exercises
- 2.3 Scheduling workouts on a calendar
- 2.4 Graphs or charts to show your exercise progress
- 2.5 Tracking your diet, and pointing out ways to balance your diet, or vitamins you might need more or less of
- 2.7 Tracking calories consumed per day/week/month
- 2.8 Tracking weight.
- 2.9 Tracking Body measurements
- 2.10 Keeping track of your heart-rate before, during, and after exercise (entered manually)
- 2.11 Tracking scores on sports or games you participate in
- 2.12 A free-writing section to store information not supported for in the program

Priority 3 functions - average less than 3

- 3.1 Tracking BMI

Appendix D

Use Case ID:	1.1		
Use Case Name:	Exerciser seeks reminders for missed exercises or days of exercise		
Created By:	Margaret Prisco	Last Updated By:	Margaret Prisco
Date Created:	11/19/05	Date Last Updated:	11/19/05

Actors:	Joe Exerciser
Description:	Reminders for missed exercises or days of exercise for the past two weeks
Trigger:	Questionnaire
Preconditions:	<ol style="list-style-type: none"> 1. Joe has an account on Workout Now! 2. Joe has access to a computer 3. Joe has access to the internet 4. Joe is logged into his Workout Now! account
Postconditions:	<ol style="list-style-type: none"> 1. Joe logs out of his Workout Now! account
Normal Flow:	<ol style="list-style-type: none"> 1.1.1 Joe clicks Exercise tab 1.1.2 Joe selects Routines 1.1.3 Joe requests a list of exercises that have not been updated in 14 days
Alternative Flows:	<ol style="list-style-type: none"> 1.1.3 Joe requests a list of days with no exercises in the past 14 days
Exceptions:	
Includes:	Calendar
Priority:	1
Frequency of Use:	
Business Rules:	
Special Requirements:	
Assumptions:	Joe keeps his exercise log up to date
Notes and Issues:	Calendar functionality might not be implemented in first release

Use Case ID:	1.2		
Use Case Name:	Exerciser seeks ability to track the distance they walk/run/jog (entered manually)		
Created By:	Margaret Prisco	Last Updated By:	Margaret Prisco
Date Created:	11/19/05	Date Last Updated:	11/19/05

Actors:	Joe Exerciser
Description:	Tracking of distance traveled
Trigger:	Questionnaire
Preconditions:	<ol style="list-style-type: none"> 1. Joe has an account on Workout Now! 2. Joe has access to a computer 3. Joe has access to the internet 4. Joe is logged into his Workout Now! account
Postconditions:	<ol style="list-style-type: none"> 1. Joe logs out of his Workout Now! account
Normal Flow:	<ol style="list-style-type: none"> 1.2.1 Joe clicks Exercise tab 1.2.2 Joe selects Calendar 1.2.3 Joe selects date 1.2.4 Joe selects desired exercise 1.2.5 Joe enters distance for exercise
Alternative Flows:	
Exceptions:	
Includes:	Calendar
Priority:	1
Frequency of Use:	
Business Rules:	
Special Requirements:	
Assumptions:	
Notes and Issues:	Calendar function may not be implemented in initial release

Use Case ID:	1.3		
Use Case Name:	Exerciser seeks ability to track the sets/ reps and weight of applicable exercises		
Created By:	Margaret Prisco	Last Updated By:	Margaret Prisco
Date Created:	11/19/05	Date Last Updated:	11/19/05

Actors:	Joe Exerciser
Description:	Tracking of sets, reps and weights of exercises
Trigger:	Questionnaire
Preconditions:	<ol style="list-style-type: none"> 1. Joe has an account on Workout Now! 2. Joe has access to a computer 3. Joe has access to the internet 4. Joe is logged into his Workout Now! account
Postconditions:	<ol style="list-style-type: none"> 1. Joe logs out of his Workout Now! account
Normal Flow:	<ol style="list-style-type: none"> 1.1 Joe clicks Exercise tab 1.2 Joe selects routines 1.3 Joe selects desired routine 1.4 Joe selects enters sets, reps and weights
Alternative Flows:	<ol style="list-style-type: none"> 1.2 Joe selects calendar 1.3 Joe selects date and routine 1.5 1.4 Joe selects enters sets, reps and weights
Exceptions:	
Includes:	Calendar
Priority:	1
Frequency of Use:	
Business Rules:	
Special Requirements:	
Assumptions:	
Notes and Issues:	Calendar function may not be implemented in initial release

Use Case ID:	2.1		
Use Case Name:	Exerciser seeks list of previous exercise		
Created By:	Margaret Prisco	Last Updated By:	Margaret Prisco
Date Created:	11/19/05	Date Last Updated:	11/19/05

Actors:	Joe Exerciser
Description:	Joe wants a list of exercises, their benefits, and instructions on how to do them, and the ability to add exercises not on the list
Trigger:	Questionnaire
Preconditions:	<ol style="list-style-type: none"> 1. Joe has an account on Workout Now! 2. Joe has access to a computer 3. Joe has access to the internet 4. Joe is logged into his Workout Now! account
Postconditions:	<ol style="list-style-type: none"> 1. Joe has logged out of his Workout Now! account
Normal Flow:	<ol style="list-style-type: none"> 1.1 Joe clicks Exercise tab 1.2 Joe selects Exercises 1.3 Joe enters a new exercise in the blank exercise field 1.4 Joe saves the new exercise 1.5 Joe selects an exercise on the list and clicks information to get instructions and benefits of the exercise
Alternative Flows:	
Exceptions:	No benefits for user entered exercises
Includes:	Exercise information
Priority:	2
Frequency of Use:	
Business Rules:	
Special Requirements:	
Assumptions:	
Notes and Issues:	

Use Case ID:	2.2		
Use Case Name:	Exerciser seeks ability to create exercise routines from exercises		
Created By:	Margaret Prisco	Last Updated By:	Margaret Prisco
Date Created:	11/19/05	Date Last Updated:	11/19/05

Actors:	Joe Exerciser
Description:	Create exercise routines by combining single exercises
Trigger:	Questionnaire
Preconditions:	<ol style="list-style-type: none"> 1. Joe has an account on Workout Now! 2. Joe has access to a computer 3. Joe has access to the internet 4. Joe is logged into his Workout Now! account
Postconditions:	<ol style="list-style-type: none"> 1. Joe logs out of his Workout Now! account
Normal Flow:	<ol style="list-style-type: none"> 1.1 Joe clicks Exercise tab 1.2 Joe selects routines 1.3 Joe enters routine name, other info 1.4 Joe selects exercises from drop down 1.5 Joe saves routine
Alternative Flows:	
Exceptions:	
Includes:	Exercises
Priority:	2
Frequency of Use:	
Business Rules:	
Special Requirements:	
Assumptions:	
Notes and Issues:	

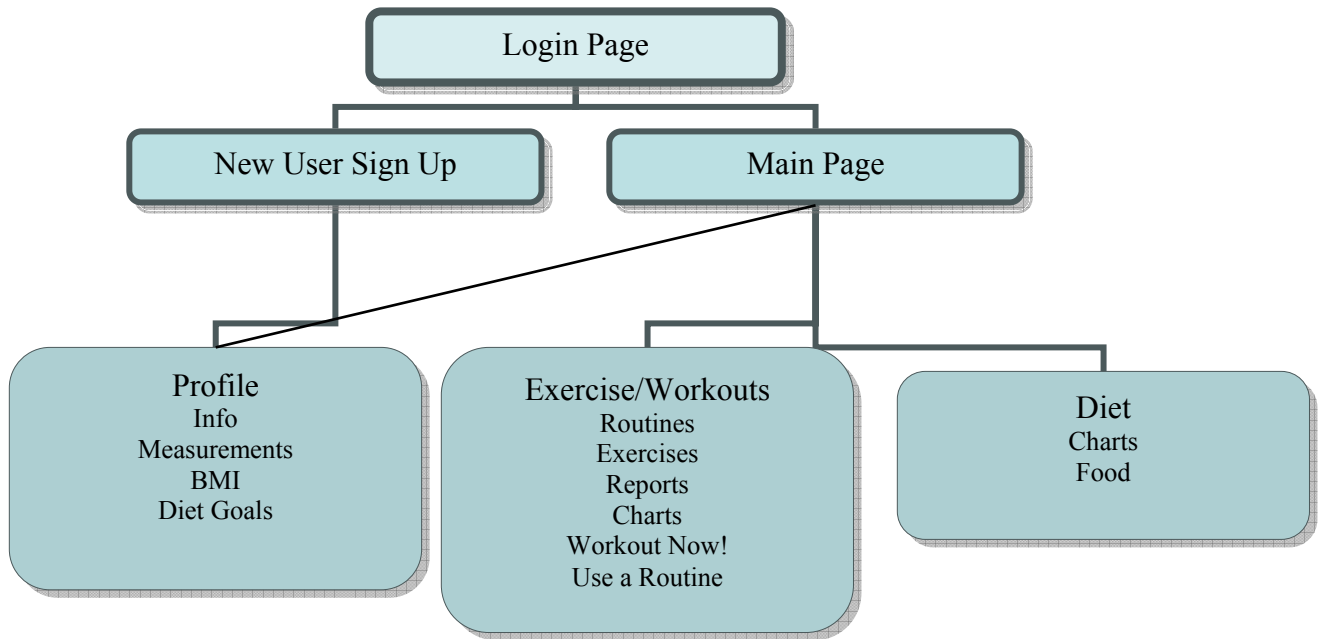
Use Case ID:	2.3		
Use Case Name:	Exerciser seeks ability to schedule workouts on a calendar		
Created By:	Margaret Prisco	Last Updated By:	Margaret Prisco
Date Created:	11/19/05	Date Last Updated:	11/19/05

Actors:	Joe Exerciser
Description:	Scheduling exercise routines
Trigger:	Questionnaire
Preconditions:	<ol style="list-style-type: none"> 1. Joe has an account on Workout Now! 2. Joe has access to a computer 3. Joe has access to the internet 4. Joe is logged into his Workout Now! Account
Postconditions:	<ol style="list-style-type: none"> 1. Joe logs out of his Workout Now! account
Normal Flow:	<ol style="list-style-type: none"> 1.1 Joe selects Calendar 1.2 Joe selects date 1.3 Joe selects desired routine from drop down of previously created routines 1.4 Joe saves entry
Alternative Flows:	
Exceptions:	
Includes:	Calendar
Priority:	2
Frequency of Use:	
Business Rules:	
Special Requirements:	
Assumptions:	
Notes and Issues:	Calendar function may not be implemented in initial release. Might also want to be able jump to routines to create routine on the fly

Use Case ID:	2.4		
Use Case Name:	Exerciser seeks ability to create graph to show exercise progress		
Created By:	Margaret Prisco	Last Updated By:	Margaret Prisco
Date Created:	11/19/05	Date Last Updated:	11/19/05

Actors:	Joe Exerciser
Description:	Ability to create a graph based on historical exercise information
Trigger:	Questionnaire
Preconditions:	<ol style="list-style-type: none"> 1. Joe has an account on Workout Now! 2. Joe has access to a computer 3. Joe has access to the internet 4. Joe is logged into his Workout Now! Account
Postconditions:	<ol style="list-style-type: none"> 1. Joe logs out of his Workout Now! account
Normal Flow:	
Alternative Flows:	
Exceptions:	
Includes:	Calendar, graphing
Priority:	2
Frequency of Use:	
Business Rules:	
Special Requirements:	
Assumptions:	
Notes and Issues:	This functionality is dependant on calendar, which may not be implemented in initial release. Graphing has not been integrated into initial design

Appendix E



References

1 <http://www.chi2006.org/call/designcomp.php> ; Student Design Competition.

2 Preece, Jennifer, Interaction Design. New York, NY: John Wiley and Sons, Inc., 2002.