ActiFit: Design Document

## Project Specifications (with Natural Language Analysis)

##### Scenario: Health Tracker

##### Key:

Nouns - Classes/Objects

Verbs - Relationships

##### Overview

A big insurance company is at the forefront of the UK personal health insurance market. It wants to develop new products which leverage both emerging technology and societal trends and in particular wants to explore the idea of a “health tracker” application. The Health Tracker aims to help inform users of basic health information as well as enable them to track their diet and fitness regime with simple goals and trending over time to see results. Initially this application is not tied to an insurance product offered by the insurance company but should support integration at a later stage if successful. The insurance company wants you to develop a solution which enables this idea to be explored as a business experiment.

##### Solution Description

The “health tracker” solution must support the creation of a basic user profile which enables a user to record key information about them. This includes physical details such as height, weight and other information required to generate a comparison of user to a healthy norm.

In addition, basic information will need to be captured including real name, a username (which can be selected by the user but must be unique) and an e-mail address which the system should validate whether it is in a valid format. The system will use the captured e-mail address to enable email communications. If this initial business experiment is successful the e-mail communication component may be augmented or replaced with instant messaging or other rapid communication mechanisms such as those enabled through social network platforms. The social network capability may be extended at a later date to enable sharing of goals and membership of groups.

Three central capabilities are required by the solution. The capability to:

1. Record on-going lifestyle details such as exercise taken and diet

2. Ability to set goals

3. And view a history of this information

The basic workflow of the health tracker solution is outlined below:

##### User Registration

1. Enter a user name

1.a.i. If username already exists in the system then the user is prompted for a new user name

2. Capture the users real name

3. Capture their email address and validate it is in a correct format

3.a.i. If validation fails prompt for a correction before allowing registration to proceed

4. Collect additional personal information required to provide initial health overview, e.g. ideal weight, BMI, …

4.a.i. Height and weight are key factors but the solution may require additional information identified by the development teams to support their health analytics / algorithm

5. If the information collected suggests a deviation of the norm provide appropriate feedback

5.a.i. This could include the capture of some initial goal details, such as a target weight

##### In use the solution provides two user data capture paths, exercise and diet

1. Exercise capture supports the selection of a type of exercise and the duration and/or distance for a specific exercise session

1.a.i. Type of exercise is a defined set of activities

2. Diet capture supports the selection of food and drink together with a value and the meal

2.a.i. Food and drink types from a list with the ability of the end user to add custom items to the list

2.a.ii. The value captured is a calorie count

2.a.iii. The meal is a defined set of meal types

##### Goal capture and recording

1. Goals are captured, recording a target such as a weight and a date

1.a.i. Optionally the creation of more complex goals, such as running a set distance under a set time

1.a.ii. If a goal is already met, advise the user and suggest a new goal

2. When the solution starts or is running using the system time it checks if any goals have exceeded target dates

2.a.i. A message is displayed stating goal met or not and asks if a new goal is to be set

2.a.ii. New goal set from C.1 step

3. Regular capture of weight is required to identify if a weight target has been met

3.a.i. Optionally this may be user configurable

##### User groups

1. Users can create and join groups to share progress towards targets

1.a.i. Groups can be created, each group will have a unique group name

1.a.ii. Group details can be shared via an email using the registered users email address

2. Opt in and opt out

2.a.i. Users can join a group from using details held within the email, this maybe a code or web link within the email content

2.a.ii. Users can select a group they are a member of and delete their membership

3. Group goals and achievements

3.a.i. Goals are distributed via e-mail and if acceptable the solution accepts a code or link to create a local goal from the details

3.a.ii. Meeting a goal generates an email to the group

## Similar Software Analysis

#### Similar Software Systems

##### MyFitnessPal

###### Features

* Goals
  + Tracks starting weight, current weight and goal weight
    - Calculates daily calorie goal by weekly goal and activity level
  + Customisable macro goals
    - Percentages of carbs, protein and fat
* Calories tracker
  + In a goal - food + exercise = remaining format
  + Allows you to add foods to meals
    - Breakfast, lunch, dinner, snacks
      * These can be manually inputted or from a list of already inputted foods
      * Can be scanned from product barcode
  + Allows you to add exercise
    - Calculates calories from activity type, time and intensity inputted
  + Shows a pie chart of which meals your calories come from, and the macros from all the food you have eaten that day
  + List of the foods highest in fat you’ve eaten
  + List of foods highest in protein you’ve eaten
  + Ability to see previous days calories
* Progress graphs of weight
  + Shows actual weight against goals
* Challenges
* Articles
  + Information on specific foods and exercises
* Friends
  + Notifications when they do exercise / lose weight etc
  + Ability to see their food intake and exercise
  + See how much weight they’ve lost / gained in total

###### Missing/Bad features

* Graph of actual calorie intake vs goal
* Graph of calorie intake vs weight

##### Fitocracy

###### Features

* List of individual exercises & combined workouts
  + Video demonstrations
  + Can set exercise parameters e.g. reps, weight, distance, time etc.
* Social feed
* Metric vs Imperial measurements
* No weight/fitness goal system
  + Only tracks exercise by points
* Too many damn popups
* User creation
  + Email, password, name
  + Weight, height, age, gender
* Can connect with other users through groups
* Achievements based on exercise points & user interaction

###### Missing/Bad features

* Custom weight/fitness goals
  + Only tracks fitness by points from exercise
  + Only goals are leveling up
* No tracking of food & drink intake

##### FatSecret

###### Features

* User creation
  + Name, weight, height, exercise levels
  + Define goals; weight loss/gain, fitness levels (run distances, weight lifting etc)
  + Generates daily caloric intake based on information entered
* Diet tracking
  + Enter foods and drink for each meal of the day plus snacks
  + Database of food with nutritional info provided
  + Can add your own foods if they are not in the database
  + Can create whole meals to avoid entering individual food items
  + Has caloric information from popular chains and restaurants
  + Tracks how close you are to caloric and nutrient goals as you enter the food you've eaten
  + Only seems to care about macronutrients(fat, protein, carbs) and not micronutrients
* Exercising tracking
  + Similar to the food tracker but with exercise
  + Deducts the calories burned during each exercise from your caloric intake for the day
  + Loads of preset exercises e.g. different run distances at different speeds
* Weight tracking
  + Graphs users weight over time
  + When you weigh in you can provide tips and journal entries for other users to read
  + Limited wight information, only a single line graph
* Journal
  + Allows journal entries for other people to read, similar to a blog. I assume it is for advice and motivation reasons.
  + Journal editor is bad - just plain text with no formatting options at all.
  + The journal entries go to a feed that followers can see. There is no curation or moderation at all so it seems very spammy and not useful at all.
  + Facebook style comments on journal entries allow for social interaction
* Dashboard
  + Plain, uninteresting dashboard with the focus being on the activity feed of others with links to the various features.
  + Works well but is not pleasant to look at.
  + The feed can be filtered (all users, friends, groups, me)
  + Overall UI is not clean nor simple, there is lots of little text everywhere and it is not immediately obvious how to navigate the site.
* Other features
  + Recipes: Allows users to upload recipes and other uses can comment and rate them. Recipes have a button that allows the user to add it to the food diary with all caloric and nutritional information.
  + Challenges: User defines a challenge or chooses a preset one. Things like lose x amount of weight in x amount of dates. The rules of the challenge are clearly defined. They have a community feel to them as everyone can post updates of how they are doing and provide tips and encouragement.
  + Messaging system
  + Profile customisation
  + Forums

###### Missing/Bad features

* No social media integration
* No responsive design

##### Runkeeper

###### Features

* Login/ registration:
  + Straight to profile setup - profile picture(optional) from file upload
  + Personal info(optional) - Full name, location, gender, date of birth.
  + Weight - select Ibs or kg.
    - Mostly simple, easy to view and enter.
* FitnessFeed
  + Feed showing friends activity - comments/status.
  + Body measurements: add new weight, view historical changes. - breaks after submitting, blank page.
  + Can find other users by name:
  + Set location
  + Connect to mobile apps.
* Main dashboard called ‘my activity total’
  + Main page - add goals, lists recent activities – can be hidden.
  + Same link to the feed and can add comments to.
  + Small graphics of the information on left panel but shown more largely.
  + Simple to view and not cluttered.
* Add new goal button –
  + pop up box gives a list of suggested goals and type such as running or walking, etc.
  + Distance and date to achieve by.
  + Can only select date in the future and gives remaining days to complete goal. Under goal green button to find race of distance selected.
  + This finds races between dates that the user selects.
    - Does not work every time. Finds races in other countries such as France, although the user can select the location.
* Reports
  + View progress between a duration such as last 30 days to 1 year.
  + Can only view distance graph.
  + Other graphics such as calories burned are locked behind a monthly payment plan of **9.99 USD / month -** which is expensive compared to other trackers.
  + Suggested apps for categories, such as sleep apps, activity tracking.
* Training
  + Create training plan - not accessible unless upgrade to payment plan.
  + Create free training plan if using mobile app.
  + Gives few free plans - such as a 5k run.
* Activities
  + Lists activities created on mobile app.
  + Track using gps
  + Can’t create on website.
* Friends
  + Add friends
  + Set location
  + Find user by name
  + See how friends are doing.
* Routes
  + Create an exercise route - see map, compare, calculate distance.

###### Missing/Bad Features

* Account settings
* Search function
* Log activity with map, date, bpm, calories
* Shows map of distance run, start and finish. Calculate distance, time, average pace and calories burnt.
* Some errors on page when submitting forms.
* Payment plan of 9.99/month
* Design.
  + Simplistic base colours scheme of white and blue.
  + Dashboard layout centred with an easy access navigation to different information on USER.
  + Main navigation bar to main pages. Left panel includes total activities, distance, calories and weight. Body measurements are only viewable to the user.
  + Also location. Small icon graphics for each navigation button – clear and legible text.
  + Inclusion of a few colours for buttons, such as a lime green.
  + Easy navigation and layout of sections not covered in adverts and pop ups.
  + Pages not cluttered and design mostly consistent.
  + Looks amateurish if paying $9.99/month, otherwise decent free website.
  + Good vector graphical images.

#### Feature Matrix

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Website | Goals | Weight Tracking | Meal Tracking (i.e. calories consumed) | Exercise Tracking (i.e. calories burnt) | Progress Graphs | Challenges | Informative Articles (i.e. recipes) | Social Interaction (i.e. Friends/Feed) | User Profile | Dashboard | User Groups | Forums |
| MyFitnessPal | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  |  |
| Fitocracy | ✓ |  |  | ✓ |  |  |  | ✓ |  |  | ✓ |  |
| FatSecret |  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  | ✓ |
| Runkeeper | ✓ |  |  | ✓ |  |  |  | ✓ | ✓ | ✓ |  |  |

## 

## User Analysis

#### User Stories & Feature Descriptions

|  |  |  |
| --- | --- | --- |
| **Recording weight & calculating bmi** | 1 | MUST |
| **As an** individual trying to lose weight | | |
| **I want to** record my weight and be shown my bmi | | |
| **So that I can** achieve my goal of losing weight | | |

User input weight & height.

Calculate BMI.

Compare value with the bmi scale.

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| --- | --- | --- |
| **Recording food intake and see calories consumed** | 2 | MUST |
| **As an** individual adhering to a diet | | |
| **I want to** be able to record all of the food and meals I eat in a day | | |
| **So that I can** see the amount of calories I am consuming and check if I’m eating to little/too much | | |

User input food consumed.

Query database and calc the calories in it.

Return value to user.

|  |  |  |
| --- | --- | --- |
| **Recording water intake and compare with recommended amounts** | 3 | COULD |
| **As an** individual looking to improve their wellbeing | | |
| **I want to** be able to track the volume of water that I am consuming each day | | |
| **So that I can** see if I am reaching my target/the daily recommended amount | | |

User inputs amount (ml) you consume.

Display on a chart against recommended volumes.

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| --- | --- | --- |
| **Recording run times/distance to improve speed** | 4 | SHOULD |
| **As an** individual with a keen interest in running | | |
| **I want to** be able to record the length of time it takes me to run a set distance | | |
| **So that I can** see if I am improving my time and getting faster | | |

User input how far they ran and how long.

Calculate pace/calories burnt.

Compare with past performance.

|  |  |  |
| --- | --- | --- |
| **Recording personal bests (gym)** | 5 | COULD |
| **As an** individual with a passion for the gym | | |
| **I want to** be able to input my personal bests for different pieces of equipment | | |
| **So that I can** see if I am improving my physical ability and making progress towards reaching my targets | | |

User inputs weight lifted on an apparatus (new or update).

Compare against what you have previously achieved.

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| --- | --- | --- |
| **Recording exercise to calculate calories burned** | 6 | MUST |
| **As a** person that exercises | | |
| **I want to** be able to input my activity, intensity and duration | | |
| **So that I can** see the amount of calories I have burned exercising, so I know how many calories I must eat to reach my goals | | |

User selects activity from options.

User specifies intensity and duration.

Calc the calories burned from those parameters.

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| --- | --- | --- |
| **Adding custom meals into the food tracker** | 7 | SHOULD |
| **As a** person that makes home-made meals | | |
| **I want to** be able to create custom meals with nutritional information | | |
| **So that I can** select these meals rather than manually inputting the meal each time | | |

Name and items (with quantities) that make the meal input.

Store in database.

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| --- | --- | --- |
| **Viewing food intake and exercise of a friend on the system** | 8 | COULD |
| **As a** person that is getting fit with a friend | | |
| **I want to** be able to see my friends exercise and food intake for each day (with permission) | | |
| **So that I can** motivate my friend and feel motivated and proud of how I eat and exercise | | |

Search for friends.

View their profile.

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| --- | --- | --- |
| **Adding friends** | 9 | COULD |
| **As a** person who wants to keep in touch with a friends progress | | |
| **I want** **to** be able to add friends | | |
| **So that I can** keep in contact with their progress | | |

Search for friends (add via email/username).

Request transmission.

View friends profile.

Commenting ability on activity.

View friends profile.

|  |  |  |
| --- | --- | --- |
| **Comment on friends profile** | 10 | COULD |
| **As a** person who wants keep contact with friends | | |
| **I want** **to** comment on friend’s status | | |
| **So that I can** keep in contact with their progres | | |

|  |  |  |
| --- | --- | --- |
| **Like a friends comment** | 11 | COULD |
| **As a** person who wants keep contact with friends | | |
| **I want** **to** like a friends comment | | |
| **So that I can** give them motivation | | |

|  |  |  |
| --- | --- | --- |
| **View graphs** | 12 | COULD |
| **As a** person who wants to view their progress | | |
| **I want** **to** view graphs of progress - weight, calories by date | | |
| **So that I can** see my progress overtime. | | |

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| --- | --- | --- |
| **Estimate weight loss** | 13 | COULD |
| **As a** person who wants to see possible amount of weight i can lose | | |
| **I want** **to** be able to view possible weight loss if i stick to target calories | | |
| **So that I can** keep track and motivated | | |

Select what they want to view a graph of.

Process data and present as graph.

View historic information.

Process and forecast based on previous trends (average continued).

User specify when in time they want to view.

Display time graphs with previous user data.

|  |  |  |
| --- | --- | --- |
| **Adding personal information - name, current weight, age** | 14 | SHOULD |
| **As a** person that want to be involved with the website | | |
| **I want to** add my personal information including my weight, age, height | | |
| **So that i** can make it more personal for my friends to see. | | |

|  |  |  |
| --- | --- | --- |
| **Create a timetable/plan** | 15 | COULD |
| **As a** person who wants to keep a routine | | |
| **I want to** create a routine timetable to follow and plan my days | | |
| **So that I can** easily follow and keep up to date with my weight-loss plan. | | |

User pick what activities and when they want to do them.

Layout what meals they will eat and when.

Display calories consume and calories burnt for each day/per week.

Store timetable.

|  |  |  |
| --- | --- | --- |
| **Finding recipes** | 16 | COULD |
| **As a** person who wants to learn to cook healthily | | |
| **I want to** be find recipes complete with all nutritional information | | |
| **So that I can** feed my family delicious meals as well as ensuring we are all getting the nutrients we need. | | |

User search by name/ingredients/calories.

Return (public meals) recipes fitting those parameters.

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| --- | --- | --- |
| **Tracking macronutrients** | 17 | SHOULD |
| **As a** long time fitness enthusiast. | | |
| **I want to** record and monitor my macronutrients from the food I eat. | | |
| **So that I can** ensure I am maximising my muscle gains from exercise. | | |

User inputs food consumed.

We query database of food.

Return the nutrient breakdown of those foods.

Compare amount to that needed by your goals.

#### MOSCOW Table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement** | **Must** | **Should** | **Could** | **Priority** |
| Record exercise to calculate calories burned | ✓ |  |  |  |
| Adding custom meals into the food tracker |  | ✓ |  |  |
| View food intake and exercise of a friend on the system |  |  | ✓ |  |
| Add friends |  |  | ✓ |  |
| Comment on a friends profile |  |  | ✓ |  |
| Like a friends comment |  |  | ✓ |  |
| View graphs |  |  | ✓ |  |
| Estimate weight loss |  |  | ✓ |  |
| Add personal information (name, age, weight) |  | ✓ |  |  |
| Creating a health plan |  |  | ✓ |  |
| Find recipes |  |  | ✓ |  |
| Track micro and macronutrients |  | ✓ |  |  |
| Record weight and calculating BMI | ✓ |  |  |  |
| Record food intake and see calories consumed | ✓ |  |  |  |
| Record water intake and compare with recommended amounts |  |  | ✓ |  |
| Record run times/distance to improve speed |  | ✓ |  |  |
| Record personal bests | ✓ |  |  |  |

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#### Use Case Description

|  |  |
| --- | --- |
| **User Account Creation** | |
| **Scenario** | User wants to sign up for the website so they can start monitoring their fitness. |
| **Brief description** | User ‘signs up’, inputting the required form details and submitting their account information to be recorded/stored and a new user profile and account to be created. |
| **Trigger** | User clicks the ‘sign up’ button. |
| **Actor(s)** | User. |
| **Preconditions** | User does not already have an account; User has a valid email address |
| **Flow of events** | 1. User clicks ‘sign up’. 2. User fills out the form details (name, username, email etc…). 3. User clicks ‘submit button’. 4. System stores the account information in the database. 5. User presented with their account dashboard. |
| **Extensions** | 2.1 User already has an account.  Prompt user that the email address has already been used and ask if they want to recover the account.  2.2 Username has already been used.  Prompt user to choose a different username.  2.3 User inputs an invalid email address.  Prompt the user to input a valid email address. |
| **Post-conditions** | A new user account has been created; User presented with their dashboard |

## Class Diagram

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## Model View Controller Architecture

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## Glossary

**Health Tracker** - An application that monitors and stores user inputted health related data. It presents analysed data and monitors changes and trends from historic information.

**Diet** - The foods eaten by an individual as well as the times of eating and quantities that are consumed.

**Fitness Regime** - The exercise activities carried out by an individual; tracked with times, duration and recorded in regard to a set period of time (e.g. each day over the course of a week).

**Goals/Targets** - A measurable value for a health parameter that is set by the user, with the intention to reached this value within a set period of time (e.g. the goal of weight x kilograms within x months).

**Exercise** - A physical activity that a user can partake in (i.e. running or swimming).

**Activity** - An instance of a form of exercise, with a date and duration.

**Meal** - A group of foods consumed together e.g. breakfast, lunch or dinner.

**User** - An individual who accesses the health tracking system, with a registered user account.

**User Profile** - The data held for each individual user outlining their personal information and health data.

**User Registration** - The process of capturing the required information to build up the base user profile.

**User Group** - A collection of individual users connected together, with the ability to communicate and share information.

**Macronutrient** - The individual groups that break down a diet into the requirements for a human to intake (e.g. Carbohydrate, Fat, Protein)

**Calorie** - A measurement with the unit kcal (or kilocalorie) to determine the energy value of food items. There are recommended daily calorie intakes to support a healthy lifestyle.

**BMI** - Body Mass Index; a value derived from a person’s mass and height. The numeric BMI value can be compared with a graph to determine corresponding category (underweight, normal weight, overweight or obese).

**Analytics** - Information sourced from the analysis of data or statistics.

Initial implementation

Language : Java

IDE: IntelliJ