

Inf 43 - Spring Quarter, 2015 - Homework 1

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Awarded Points	Maximum Points	Document Aspect
	15	Clarity of writing (spelling, grammar, sentence construction) and Clarity of expression (flow, structure, making logical arguments). Roughly 7.5 each.
	15	Introduction / Executive Summary (can be different sections or combined into one)
	7.5	Application Context / Environmental Constraints (can be different sections or combined into one)
	35	Functional Requirements, including use-case diagram and each use case (following a use-case template).
	7.5	Software Qualities and Non-functional Requirements
	5 (+5)	Other Requirements and Other Items. At least a Glossary of Terms. You can earn up to 5 points Extra Credit if you go beyond Glossary
	7.5	Assumptions / Risks (can be different sections or combined into one)
	7.5	Priorities / Implementation Phases; Future Directions and Expected Changes
	100	TOTAL

ZotMyHealth System Requirements

April 28, 2015

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Introduction

ZotMyHealth is a health data tracking software project commissioned by Health Beacon, Inc. in order to promote data standardization in the field of personal health management. ZotMyHealth will be developed by Erin Anteater, LLC. While health conscious smartphone and tablet users have been able to track health data through many different applications (apps), standardization and centralization of said data has been poor. The primary purpose of the software project is to help users keep track of three different kinds of data: (1) calorie intake, (2) calories burned through exercise, and (3) amount of sleep. In order to help users do this effectively, they may link ZotMyHealth with third party apps, such as FitBit, MyFitnessPal, and WakeMate. ZotMyHealth will allow users to have standardized and centralized methods for keeping track of their health goals.

This document details the requirements for ZotMyHealth and will be used as a reference for Health Beacon, Inc. and Erin Anteater, LLC for the purchase and development of the software, respectively. This document is organized into the following sections:

- I. Overview / Executive Summary**
- II. Application Context / Environmental Constraints**
- III. Functional Requirements**
 - a. Create Account
 - b. Login
 - c. View Tutorial
 - d. Import Data
 - e. Export Data
 - f. Set Preferences
 - g. Input Calorie Intake
 - h. Input Calories Burned
 - i. Sync Data
 - j. Edit Existing Data
 - k. View Graphs
 - l. Receive Notification
 - m. Logout
 - n. Delete Account
- IV. Software Qualities and Non-functional Requirements**
 - a. Software Qualities
 - b. Non-functional Requirements
- V. Other Requirements**
 - a. Miscellaneous Requirements
 - b. Glossary of Terms
- VI. Assumptions / Risks**
- VII. Priorities / Implementation Phases**
- VIII. Future Directions and Expected Changes**

I. Overview / Executive Summary

Health conscious smartphone and tablet users have traditionally tracked their health data through a variety of different applications (apps). Little progress has been made to standardize or centralize data tracked by these apps. ZotMyHealth will be the first app to achieve this goal. Users of currently existing health monitoring software will be able to store, view, and track all data in one centralized location.

The major features of the system are (1) Import existing health data from third-party apps, (2) Sync with third-party apps to import future data automatically, (3) Track and edit collected data in one centralized location, and (4) Input calorie intake and calories-burned data directly through ZotMyHealth.

(1) Import existing health data from third-party apps

Health conscious smartphone/tablet users that already use apps such as FitBit and MyFitnessPal will be able to import all of the data previously collected by these apps upon creation of an account with ZotMyHealth.

(2) Sync with third-party apps to import future data automatically

Users of ZotMyHealth will be able to select preferred third-party apps from which to automatically import data collected in the future. This will eliminate the need for users to repeat the first function of ZotMyHealth.

(3) Track and edit collected data in one centralized location

Users of ZotMyHealth will be able to view all data imported from third-party apps by day and by date ranges in the form of graphs. Users will be able to manually edit any of the data stored in the app. Notifications will also be provided to help users that may not be achieving their goals.

(4) Input calorie intake and calories-burned data directly

Users of ZotMyHealth may enter meals, recipes, or create their own recipes to have suggested calorie intake data input by ZotMyHealth. Similarly, users will be able to enter information about their exercises to have suggested calories-burned data input by ZotMyHealth.

The above functionality will be achieved by storing data centrally on Health Beacon, Inc.'s Amazon servers, and by using their existing algorithms and databases to create graphs and suggest calorie information.

II. Application Context / Environmental Constraints

ZotMyHealth is expected to run on Android, iOS, Windows, and as a Web Application (WebPortal). The Android/iOS apps will run on both tablets and smartphones. The WebPortal will run in all major browsers, including Microsoft Internet Explorer, Google Chrome, Mozilla Firefox, and Opera Web Browser. The intended audience for the app is people who already use apps such as MyFitnessPal and FitBit.

While there are no specifications for programming language, the standards of Java for Android, Objective-C/Swift for iOS, and .NET for Windows should be used. The programming languages for the WebPortal will be determined at a later time. The WebPortal will be capable of exporting data to a Microsoft Excel format spreadsheet. All of the apps must use programming languages that are capable of communicating with Health Beacon, Inc.'s Amazon servers.

The apps are required to be “always online,” and to have no local storage of data. All health data will be stored on Health Beacon Inc.'s Amazon servers. However, like other apps such as Facebook, users will be able to see the several most recently viewed items on the app in the event of a lost connection. This will be done by using a very small amount of local caching.

While there are no specific design/user interface (UI) constraints, it will be simple, easy to use, and will conform to expectations and standards provided by the platforms on which the software will operate. For example, Google's Material Design standards will be used in the Android app.

III. Functional Requirements

This section introduces the ways that users will interact with the ZotMyHealth software system. It details all of the necessary use cases (interactions) with the ZotMyHealth system for its complete functionality.

First, the use case diagram for the system is presented. Second, each use case is addressed individually in detail, by specifying its goal, which version of the app can be used, preconditions, the actors involved and what each actor does (the basic flow), and how the system responds. If applicable, alternative and exception flows may be shown.

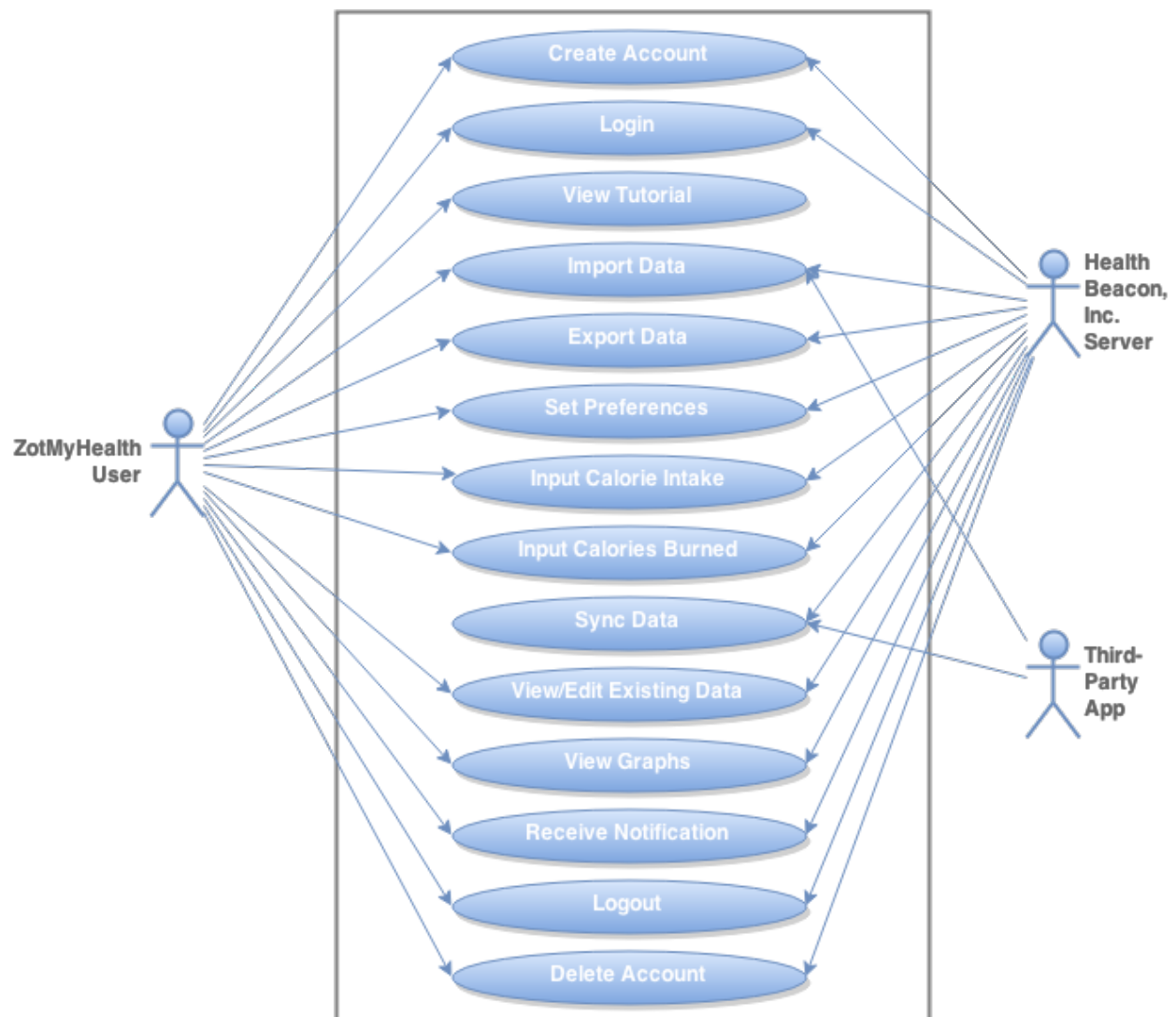


Fig. 1 - ZotMyHealth Use Case Diagram

a. Create Account

Goal

Allows users to sign up for an account with ZotMyHealth. This registers users in Health Beacon, Inc.'s server.

Supported Version(s)

Android

iOS

Preconditions

None

Actors Involved

ZotMyHealth User

Health Beacon, Inc. Server

Basic Flow

1. System prompts user for unique email address and user ID (the user may use email address as user ID), name, password (minimum one character), gender, and (optional) age, weight, and height. (If height/weight are entered, BMI is calculated and displayed)
2. The Health Beacon server then checks that all of the information is appropriate and sends a confirmation email if it is.

Alternative/Exception Flow

- If in step 2 the information is invalid, the system continually prompts for corrections, and no account is created until valid information is entered.
- If there is no internet connection, an error message will be displayed and the user account will not be created.

System Response

The system recognizes that the new user is logged in.

b. Login**Goal**

If the user has logged out and needs to log back in or needs to log in from a different device, this functionality allows him/her to do so.

Supported Version(s)

Android
iOS
Windows
WebPortal

Preconditions

User has account

Actors Involved

ZotMyHealth User
Health Beacon, Inc. Server

Basic Flow

1. System prompts user for user ID or email address and password.
2. User enters above information.
3. Health Beacon Server checks for valid information.

Alternative/Exception Flow

- If the information entered is invalid, or if the user does not know his/her password, he/she can choose to reset the password. In this case, a link to reset the password is sent via email from the Health Beacon Server. After the user resets his/her password, he/she can resume from step 2. If the user cannot provide valid credentials, login will be unsuccessful.
- If there is no internet connection, an error message will be displayed and the user will not be able to login.

System Response

The system recognizes that the user is logged in

c. View Tutorial

Goal

To help users learn about how to use the ZotMyHealth application.

Supported Version(s)

Android
iOS
Windows
WebPortal

Preconditions

None

Actors Involved

ZotMyHealth User/Prospective User

Basic Flow

1. A user opens the tutorial
2. User searches for and reads needed information

Alternative / Exception Flow

NA

System Response

NA

d. Import Data

Goal

To allow users to import past data (calories consumed, calories burned, hours of sleep) from supported third-party applications.

Supported Version(s)

Android
iOS

Preconditions

User has account / is logged in

Actors Involved

ZotMyHealth User
Health Beacon, Inc. Server
Third-Party App

Basic Flow

1. System prompts which type(s) of data to be imported, from which app(s), and the date range
2. User enters above information
3. System asks third-party app(s) for data
4. Third-party app(s) send system data
5. System sends data to Health Beacon Server

Alternative/Exception Flow

-If data already exists for the date range, the system will display an error message prompting the user to delete the already-existing data. The user may do this (see use case j) and then repeat the process. Otherwise, no data is imported.

-If there is no internet connection, an error message will show and no data will be imported.

System Response

Imported data can now be viewed via graphs or the view/edit functions.

e. Export Data

Goal

To allow users to export their health data to a Microsoft Excel Spreadsheet

Supported Version(s)

WebPortal

Windows

Preconditions

User has account / is logged in

Actors Involved

ZotMyHealth User

Health Beacon, Inc. Server

Basic Flow

1. User chooses option to export data
2. System pulls all of the data from the Health Beacon Server and creates a Microsoft Excel Spreadsheet file from the data

Alternative/Exception Flow

-If there is no data associated with the user's account, no spreadsheet will be exported.

-If there is no internet connection, no spreadsheet will be exported.

System Response

NA

f. Set Preferences

Goal

To allow a user to change his/her information and preferences.

Supported Version(s)

Android

iOS

WebPortal (limited)

Windows (limited)

Preconditions

User has account / is logged in

Actors Involved

ZotMyHealth User

Health Beacon, Inc. Server

Basic Flow

1. The user views and edits the following the information:
 - a. Password, Name, Age, Height, Weight, Gender, Preferred Units
(If height and weight are entered, BMI is calculated and displayed)
 - b. Preferred sync apps (Android and iOS only)
 - (1) Calories burned

- (2) Calories consumed
- (3) Sleep
- c. Daily calorie intake limit
- d. Daily calories burned limit
- 2. Upon the user updating this information, the information is sent to the Health Beacon Server and is validated

Alternative/Exception Flow

- If the user enters any invalid information, an error message is displayed and the preferences are not updated. e.g., A user enters “b” for height
- If there is no internet connection, an error message is displayed and no preferences are changed.

System Response

The user’s updated preferences go into effect immediately

g. Input Calorie Intake

Goal

To allow users to enter meals, recipes, or ingredients to provide an estimate of calories consumed in meal.

Supported Version(s)

Android
iOS

Preconditions

User has account / is logged in

Actors Involved

ZotMyHealth User
Health Beacon, Inc. Server

Basic Flow

1. The user is asked to enter either a meal name, to create a meal from ingredients, or to enter number of calories.
2. The System queries the Health Beacon Server as the user inputs information to offer suggestions (similar to Google Search)
3. Calorie information for this meal is input (0 if not enough information available)

Alternative/Exception Flow

- If there is no internet connection, an error message will be displayed and no information will be recorded

System Response

The new data can be viewed and edited via ZotMyHealth

Important Issue

Local storage is used to save meals created by users. They are not stored on the Health Beacon Server and are not associated with the user account (local to device only).

h. Input Calories Burned

Goal

To allow users to enter information about their exercises to estimate the number of calories burned.

Supported Versions(s)

Android
iOS

Preconditions

-User has account / is logged in

Actors Involved

ZotMyHealth User
Health Beacon, Inc. Server

Basic Flow

1. User is prompted to enter the following information:
 - a. Exercise Name
 - b. Time
 - c. Weight
 - d. Reps
 - e. Calories
2. The system queries the Health Beacon Server to find information for an exercise and can give suggestions (similar to Google search)
3. Calories burned info is input (0 if not enough/invalid information)

Alternative/Exception Flow

-If there is no internet connection, an error message will be displayed and no information will be recorded

System Response

The new data can be viewed and edited via ZotMyHealth

i. Sync Data

Goal

To automatically import data from a single preferred app for each data type (calorie intake, calories burned, sleep)

Supported Version(s)

Android
iOS

Preconditions

- User has account / is logged in
- User has set preferred sync app for at least one data type in Preferences

Actors Involved

Third-Party App
Health Beacon, Inc. Server

Basic Flow

1. Whenever ZotMyHealth is running, it will periodically check with third-party apps.
2. If third-party apps have new information, it will be sent to the Health Beacon Server.

Alternative/Exception Flow

- If there is no internet connection, no data will be sent
- If there is conflicting data already on the server, either an error message prompting to delete the data will be displayed, or no syncing will occur (TBD in design phase)

System Response

The new data can be viewed and edited via ZotMyHealth

j. View/Edit Existing Data**Goal**

To view and/or edit data that has been imported, automatically synced, or manually entered in the past.

Supported Version(s)

Android
iOS
Windows
WebPortal

Preconditions

- User has account / is logged in

Actors Involved

ZotMyHealth User
Health Beacon, Inc. Server

Basic Flow

1. A user can select past data entries to calories burned, calories consumed, and sleep.
2. If a user wants, he/she can choose to edit/delete a data entry (or a date range)
3. The system prompts the user for the relevant information (hours of sleep, calories burned, calories consumed)
4. The information is updated on the Health Beacon Server and is displayed on the app

Alternative/Exception Flow

- If the user enters erroneous data, the system prompts the user to fix it.
- If there is no internet connection, the data cannot be viewed or edited.

System Response

None if data is viewed only, but data is immediately changed or removed from system if edited or deleted, respectively.

k. View Graphs**Goal**

To allow the user to view progress and/or trends for each of the three tracked types of data.

Supported Version(s)

Android
iOS

Preconditions

-User has account / is logged in

Actors Involved

ZotMyHealth User

Health Beacon, Inc. Server

Basic Flow

1. User chooses type of data and a date range to view
2. System queries server for data and displays a graph scaled in an appropriate/meaningful way
 - a. Calories burned vs. Day
 - b. Calories consumed vs. Day
 - c. Hours of sleep vs. Day
3. User can zoom in and out and click on individual days (interactive)

Alternative / Exception Flow

- If a user is not connected to the internet, no graphs will be displayed
- If there is less than 5 days of data available in a given date range, no graph will be shown

System Response

Graph is viewable/interactive immediately

I. Receive Notification**Goal**

If the system detects that a user has gone beyond his/her daily limit of calories burned or calories consumed, a notification displaying this information is shown.

Supported Version(s)

Android

iOS

Preconditions

User has account / is logged in

User has set limits in preferences

Actors Involved

ZotMyHealth User

Health Beacon, Inc. Server

Basic Flow

1. System is notified by Health Beacon Server that a user preference limit has been surpassed
2. System sends message to user displaying information that limit has been surpassed

Alternative/Exception Flow

- If a user is not connected to the internet, the notifications will not be displayed because messages from the server will not be received.

System Response

NA

m. Logout

Goal

To allow users to logout (in the event of getting a new device, or allowing someone else to log in)

Supported Version(s)

Android

iOS

WebPortal (added functionality to force logout from all devices)

Windows

Preconditions

User has account / is logged in

Actors Involved

ZotMyHealth User

Health Beacon, Inc. Server

Basic Flow

1. User logs out

2. Server no longer syncs data from Android/iOS third-party apps

Alternative/Exception Flow

-User can force logout all devices via the WebPortal

-If user is not connected to the internet, the Server will not be able to receive the logout message, so a logout will not occur

System Response

User may not interact with system via anything other than “Login” and “Create Account” use cases

n. Delete Account

Goal

To allow users to delete their account

Supported Version(s)

Android

iOS

Windows

WebPortal

Preconditions

User has account / is logged in

Actors Involved

ZotMyHealth User

Health Beacon, Inc. Server

Basic Flow

1. User deletes account

2. User can only see login screen, and all app syncing stops

Alternative/Exception Flow

-If the user is not connected to the internet, the server cannot receive the delete account request, and the account will not be deleted

System Response

User may not interact with system via anything other than “Login” and “Create Account” use cases. The user can only “Login” if he/she has an account other than the one just deleted. The system forces logout of all other devices logged into the deleted account.

IV. Software Qualities and Non-functional Requirements

a. Software Qualities

Security

Health Beacon, Inc., because it is dealing with personal health data, requires that the information be secure. The login/logout, force logout, and delete account features are intended to address this concern.

Issues: With no strict password requirements and no locking of an account after unsuccessful login attempts, security improvements are strongly advised.

Availability

ZotMyHealth needs to be available to users at all times when they have an internet connection. Using the Health Beacon Amazon Server addresses this concern, as it is unlikely to ever go down.

Issues: With the always-online requirement, syncing may not function as well as intended. Some local storage is suggested to deal with this problem.

Usability

ZotMyHealth needs to be simple-to-use and efficient. These concerns will be addressed by adhering to good design standards, and by syncing with apps with which people are already familiar.

Scalability

Health Beacon Inc. intends to eventually scale ZotMyHealth into an app that can track **all** health data in one place (standardized and centralized). The app should be extremely scalable for this purpose.

Reliability

ZotMyHealth should be extremely reliable. Health Beacon’s Amazon Server addresses this concern. It will also be addressed by good software architecture and programming practices.

Efficiency

ZotMyHealth should be extremely efficient. This concern is addressed by having no local storage. Good programming practices will also be used to address speed.

Issues: With no local storage, the app may not make efficient use of internet/data. This may cause problems for users relying heavily on cellular data plans.

Portability

ZotMyHealth should be portable. This concern is addressed by having iOS, Android, Windows, and WebPortal version.

Issues: It is recommended that data input be allowed via WebPortal and Windows apps to increase portability.

b. Non-functional Requirements

1. The software will only use the English language.
2. In general, it is required that a user be always connected to the internet to use the application
3. Limits to calories consumed / burned and hours slept must be daily
4. No other database can be used aside from Health Beacon, Inc.'s Server
5. Units cannot be selected for calories
6. The mobile apps will not have a landscape orientation
7. The only emails sent from the server are account creation confirmation and password reset
8. If a user is logged out while preferred third-party apps are collecting new data, the data must be imported manually when the user logs back in
9. The app will not display which third-party app data is imported from

V. Other Requirements

a. Miscellaneous Requirements

1. Sleep data cannot be input manually via ANY platform. It can only be imported or entered via the sync method. It can, however, be updated or deleted via any platform.
2. Signup/Account Creation is not allowed via the Windows app or the WebPortal
3. ZotMyHealth will not directly “capture” any data without the help of a third-party app.
4. Syncing should be account-specific (to third-party app accounts) and device-specific.
5. Some preferences (preferred syncing apps, importing data from third-party app) cannot be viewed via the Windows app or WebPortal.

b. Glossary of Terms

Health Beacon, Inc. - a health data company looking to make an application for centralized and standardized health data

ZotMyHealth - the application to be developed for Health Beacon, Inc. to track health data

Erin Anteater, LLC - the corporation being employed by Health Beacon, Inc. to make ZotMyHealth

Application (app) - a computer program used by a user of a smartphone, tablet, personal computer, etc.

Health Beacon, Inc. Server - the Amazon server operated by Health Beacon, Inc. that stores users' health information, recipe/calorie information, and exercise/calorie information

Web Application (WebPortal) - an application that runs on a web browser

Excel - spreadsheet program made by Microsoft

Third-party app - an app with which Health Beacon, Inc. has made an agreement to get various health data from

ZotMyHealth User - a person who has or will have an account with ZotMyHealth and uses or will use the application. Typically someone who is familiar with and uses apps such as Fitbit and MyFitnessPal

Fitbit - a device that senses and tracks user motion

MyFitnessPal - an app that tracks diet and exercise data

WakeMate - an app that monitors the sleep activity of a user

Notification - a pop-up on a smartphone/tablet displaying various information

Sync - the automatic transfer of data from one platform to another

BMI - body mass index

VI. Assumptions / Risks

It is assumed that people will continue to want to track their health data via smartphones, tablets, and other devices. It is also assumed that these people will have continued access to the internet. Finally, it is assumed by the CEO of Health Beacon, Inc., that people should not track their sleep data without the use of an application.

The following is a list of different **risk areas** that Health Beacon, Inc. must be aware of:

Ethical - tracking information about the health data of various individuals can be considered unethical, and there are strict laws governing such data. Having health information stolen poses an ethical risk as well.

Financial - with no apparent income model for ZotMyHealth, Health Beacon, Inc. assumes a large financial risk.

Legal - health data is heavily governed by laws such as HIPAA. Legal problems are likely to arise upon heavy usage of ZotMyHealth. Limited security measures increase the likelihood of legal troubles.

Development - if third-party apps cease to exist, fall out of popularity, or cancel agreements with Health Beacon, Inc., the development process can be delayed or even postponed indefinitely. Reliance on these third-party apps is not suggested in the long-term.

VII. Priorities / Implementation Phases

Health Beacon, Inc. has expressed its priorities via implementation phases. The phases are as follows:

Phase I

- Android/iOS Apps

 - Calories burned / Calories consumed tracker and graph capability

 - Basic user preferences

Phase II

- Android/iOS Apps

 - Ability to connect with third-party apps

 - Sleep tracking functionality and graph capability

 - Notifications

 - Finish user preferences (preferred syncing apps, import data)

Phase III

- WebPortal

 - Export to Excel

- Tutorial

- TBD: Windows app if time/money allows

VIII. Future Directions and Expected Changes

Health Beacon, Inc. has expressed that it would like to eventually achieve complete standardization and centralization of health data. For these purposes, ZotMyHealth should be scalable to track health data without the use of third-party applications, and to be able to handle massive amounts of data. Health Beacon, Inc. has also expressed interest in sharing health information via social media in the future.