Project Analysis

Project Topic: Health Monitoring System

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# **Revision History**

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| --- | --- | --- | --- |
| Revision Number | Date | Description | Name |
| 0 | 8/28/2020 | First draft created by Todd; Group 4 contributed to brainstorm ideas during 9/25 ZOOM meeting. | Todd |
| 1.0 | 9/5/2020 | UPDATE: Added cover page, revision table, table of contents, updated formatting, **basic** spellcheck, offered different image options, aligned lists based off professor provided template. | Audrey |
| 1.1 | 9/5/2020 | UPDATE: Updated mapping. Added text to sections f(1), f(2) to explain subsystem function further. Moved text description on Figure 2 Subsystem diagram to reflect Changes in section f(1). Updated grammar. | Todd |
| 1.2 | 9/7/2020 | UPDATE: Implemented suggested changes. Minor formatting changes. | Brandon |
| 1.3 | 10/5/2020 | UPDATE: Minor updates to document based on actual implementation. | Brandon |

**Table of Contents**

[**Revision History** 2](#_Toc52816393)

[**Topic** 4](#_Toc52816394)

[**Analysis** 4](#_Toc52816395)

[**Analytical steps** 4](#_Toc52816396)

[**a.** **Outside Systems** 4](#_Toc52816397)

[**b.** **Input Data** 4](#_Toc52816398)

[**c.** **Output Data** 4](#_Toc52816399)

[**d.** **Data Processing** 5](#_Toc52816400)

[**Context Diagram** 5](#_Toc52816401)

[**e.** **Subsystems** 5](#_Toc52816402)

[**f.** **Interface Between Subsystems** 7](#_Toc52816403)

[**g.** **Subsystem Functionality Mapped to System Requirements** 7](#_Toc52816404)

[**h.** **Identify enhancements** 9](#_Toc52816405)

[**i.** **Risk and Mitigation** 10](#_Toc52816406)

# **Topic**

The Health Monitoring Project is designed for a user to download the application and maintain health records on their personal platform.

### **Analysis**

## **Analytical steps**

The analytical steps outlined below will enumerate the basic progression from outside systems/user interaction to data input, processing, and data output, and expectations for presentation to the end user.

### **Outside Systems**

* User
* Locally maintained database

### **Input Data**

Input data are the arguments entered by the end user during the profile login(authentication), creation, and update stages of the program lifecycle; are as outlined below, but not limited to:

* Authentication: Username, Password
* Biometrics: Gender, Weight, Height, Age, Activity Level, Target Weight

**NOTE**: for viewing purposes and brevity, the mention of ‘Authentication’ assumes credentials of username and password. The mention of ‘Biometrics’ assumes the included: Gender, Weight, Height, Age, Activity Level, Target Weight.

### **Output Data**

Output data is the data that is displayed to the user via graphical user interface (GUI), the components are as outlined below, but not limited to:

* Biometrics
* Progress chart
* Error/Alert Messages (failed login, successful profile create/update/delete)

### **Data Processing**

The data processing that is calculated and presented is as outlined below, but not limited to:

* Calculate daily calories to meet target
* Use historic data to make progress chart
* Update user information (including goal, and user delete)
* Log in /authenticate user

### **Context Diagram**

The context diagram is shown below in Figure 1. This diagram depicts the outside system (the user and the local database), the input data (authentication, biometrics), and the intended output data (biometrics, progress chart, error/alert messages).

**Figure 1**

**Context Diagram**

Authentication; biometrics

Biometrics; progress chart;

Daily Calorie Target; error/alert messages

### **Subsystems**

Based off the above data processing step d, we break down our system into the following subsystems: Login, Database, Calculation, Chart, and Primary Display

**NOTE:** the end user being the intended target for input and output*.*

These subsystems are necessary to perform the data processing function that converts input data to output data and authentication. The subsystem diagram in Figure 2 depicts the relationship among these subsystems. Recall, ‘Authentication’ assumes credentials of username and password. The mention of ‘Biometrics’ assumes the included: Gender, Weight, Height, Age, Activity Level, Target Weight.

**Figure 2**

**Subsystem Diagram**

Biometrics

Progress Chart

Daily Calorie Target

Alert/Error Messages

**Health Monitoring**

**System**

Authentication

Biometrics

Authentication

Biometrics,

Create New User

Alert/Error Message

Historic user data

User data

User data

Progress chart

Daily Calorie Target

### **Interface Between Subsystems**

The interface between subsystems is intended to identify the transfer of data between the different subsystems, which subsystem process the input (authentication, biometrics) and which subsystem presents the output (Biometrics, Progress Chart, Daily Calorie Target, Alert/Error Messages).

1. Login Subsystem receives the following input form the user: Username, Password, Gender, Weight, Height, Age, Activity Level, Target Weight. This subsystem uses the username and password to query the database and authenticate the user; a message will be displayed if authentication is unsuccessful. This subsystem also facilitates new account creation.
2. The Calculation Subsystem uses the user data from the database and calculates the daily caloric target and updates the display.
3. The Chart Subsystem uses historic data from the database and updates the Primary Display with a progress chart.
4. The Display Subsystem displays the currently authenticated user data retrieved from the database, the progress chart, daily caloric calculation, and provides a user input region to update biometric data. This subsystem also provides a means to delete currently authenticated user as well as a means to sign out the currently authenticated user.
5. The Database subsystem hosts data and responds to requests from other systems.

### **Subsystem Functionality Mapped to System Requirements**

The following table lists the subsystems that implement the system requirements. Subsystems include: Input Subsystem, Login Subsystem, Database Subsystem, Calculation Subsystem, Chart Subsystem, and Display Subsystem.

| **Requirement #** | **Description** | **Subsystem Supporting Functionality** |
| --- | --- | --- |
| **Functional Requirements** | | **Requirement Traceability** |
| 1 | The system shall provide a graphical user interface(GUI). | Primary Display |
| 2 | The system shall provide login page, with login/signup/cancel button and required function | Primary Display, Login |
| 3 | The system shall display the formatted current date (MMMDDYYYY). | Primary Display |
| 4 | The system shall display the username of the user currently signed in. | Primary Display, Database |
| 5 | The system shall provide a means to UPDATE/SAVE GOAL data. | Primary Display, Database |
| **Unique User Account Requirements** | | **Requirement Traceability** |
| 6 | The system shall support multiple unique users. | Database |
| 7 | The system shall provide a means to LOG\_OUT of the application. | Primary Display |
| 8 | The system shall provide a means to LOGIN to the application. | Database, Login |
| 9 | The system shall provide a means to CREATE\_NEW\_USER. | Database, Login |
| 10 | The system shall notify the user if a duplicate user ID is used with the CREATE\_NEW\_USER function. | Database, Login |
| 11 | The system shall notify the user if the login credentials provided do not match what is saved in the corresponding database. | Database, Login |
| 12 | System will not allow access without valid credentials | Database, Login |
| 13 | The system shall populate all available fields with associated saved GOAL data upon successful login. | Primary Display, Database, Login, Chart, Calculation |
| 14 | The system shall provide a means to DELETE\_USER. | Primary Display, Database |
| 15 | The system shall enforce password requirements. | Primary Display, Login |
| **GOAL Data Requirements** | | **Requirement Traceability** |
| 16 | The system shall save GOAL data associated with each unique user. [Commentary: GOAL data consists of:  Gender: (M)(F) Weight: (pounds) Height: (inches) Age: (years) Activity Level: ( S | L | M | VA | EA ) [Commentary: S = sedentary, L = light, M = moderate, VA = very active, EA = extremely active]] | Database |
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| 17 | The system shall display GOAL Analysis.  [Commentary: GOAL Analysis displays daily caloric intake required to meet target body weight, based upon user-provided GOAL data.] | Primary Display, Database, Calculation |  |
|  |
| 18 | The system shall provide a progress chart displaying GOAL Analysis data. | Primary Display, Chart, Database |  |
| 19 | The system shall display Current Stats (height, weight, target GOAL weight). | Primary Display, Database |  |

### **Identify enhancements**

Introducing enhancements and new feature integration to the application welcomes diverse user capabilities as well as potential risks. Enhancements are identified but not limited to:

* Allow the user to export data
* Weekly reminders (email, pop-up notifications)
* Two Factor Authentication

### **Risk and Mitigation**

Diversifying and allowing external applications to store and communicate with application data welcomes the potential for leaking sensitive data. Since the data stored is not mandated or evaluated by healthcare professionals and healthcare systems, it is not regulated nor meets the criteria of HIPAA standards. Therefore, does not require physical standards that otherwise covered entities must implement to ensure the confidentiality, integrity, and availability of PHI (Protected Health Information) and IIHA (Individually Identifiable Health Information), but remains in the scope of PII that is used outside of the healthcare context.

Feature risks and their mitigations are identified but not limited to:

**Risk:** Loss of data **Mitigation:** Local/cloud database backups

**Risk:** Account Hacked **Mitigation:** Allow password reset

**Risk:** Exposing data **Mitigation:** Keep user login separate from user data