|  |
| --- |
| UAH Fit Vault Software Design Specification |
| CPE 656/658 Software Studio |
| Timothy R. Wilkins  Whit J. Sisulak  Glen L. Riden  James J. Duggan IV |

10/25/2015

# Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| Revision # | Revision Date | Description of Change | Author |
| 0.1 | 10/12/15 | Initial Draft | J. Duggan  W. Sisulak |
| 0.2 | 10/25/15 | Updated scope and architecture. Changed title and file name. | J. Duggan  W. Sisulak |
| 1.0 | 4/26/16 | Updated detailed design | J. Duggan |
|  |  |  |  |

# Table of Contents

[Revision History i](#_Toc432431166)

[Table of Contents ii](#_Toc432431167)

[1 Introduction 1](#_Toc432431168)

[1.1 Purpose 1](#_Toc432431169)

[1.2 Scope 1](#_Toc432431170)

[1.3 Definitions, Acronyms, and Abbreviations 2](#_Toc432431171)

[1.4 References 2](#_Toc432431172)

[1.5 Overview 2](#_Toc432431173)

[2 System Architecture Description 2](#_Toc432431174)

[3 Detailed Description of Components 2](#_Toc432431175)

Software Configuration Plan

# Introduction

## Purpose

The purpose of this document is to provide a detailed design of the UAH Fit Vault software projects. This document should be used as a reference for the software system architecture and detailed design descriptions of the system components. The intended audience for this document includes system developers, testers, customers, and any other stakeholders.

## Scope

The UAH Fit Vault software package will be a web application that will accept medical data from users and display the data in a meaningful way. There are two major components to this software. The first is the data collection tool that is used by the users to upload their medical data that is recorded by one of the supported wearable medical devices. There are three different medical devices supported for this project that record various types of data. The data provided by these devices consists of different file formats, and the data is different from device to device. The software will have to determine the contents of each file and how to process them. Due to how long data transfers take to download the data from a device, there may be a need in the future to convert the data from a binary format to another format in order to speed up the process of getting data off the device. The software needs to able to take in files provided by the medical devices process the files, and store the data in a database. The software should have the ability to process multiple files at a time as well as individual files.

The other major component of the web application is the data analysis tools used to analyze the data that is captured from the data collection tool mentioned above. The software needs to perform data analysis over different intervals of time such as one week, one month, etc. There will need to be some way to manage user access to the various medical data that has been inserted into the database that this software will access. Below are some proposed data analysis ideas that can be incorporated into the project.

* Simple Moving Average
* Data correlation discovery between the multiple devices.
* Possibly determine when an individual moves from walking to running or simply being able to identify the activities that were being performed while the data was being captured.

The data analysis possibilities will likely not fully be realized until the project team understands the different types of data that are available. Also, there will need to be collaboration with the customer for additions or changes to the data measurements provided by this software. The web application will have to have different levels of user access which will be defined later in this document.

## Definitions, Acronyms, and Abbreviations

|  |  |
| --- | --- |
| SDD | Software Design Document / Software Design Specification |
|  |  |
|  |  |
|  |  |

## References

IEEE Std 1016-1998, IEEE Standard for Software Design Specification

## Overview

The remainder of this design specification document addresses the software system architecture, detailed design information for the various system components, and the database schema design. Each major section will be broken into two pieces each detailing the design criteria for the two pieces of software the make the UAH Fit Vault.

# System Architecture Description

## Overview of Components



**Figure 2.1**: Architectural Overview

The UAH Fit Vault application is a Web application that is comprised of and encompasses the presentation, business logic, and data access layers. The system interacts with the end user via a web interface and with an external SQL database hosted on a remote server. It is assumed that the user is authenticated to use the application.

* The presentation layer consists of a web interface for data processing and reporting. The data processing portion will have the ability to select files for processing. It will have a button to initiate the processing of files. An addition screen will allow the user to enter and activity to be applied to the data by date/time. Once they have been processed and uploaded into the database the system will return to the user a display of the results once completed. The data metrics and reporting functionality is another portion to be defined later.
* The business logic layer will consist of all the back end code comprised of classes to handle the parsing and processing of files as well as provide the logic to render metrics and reports. It will use the DB handler in the data access layer to interact with the database and the front end GUI to receive data from and display results back to the user.
* The data access layer will consist of all the back end code needed to interact with an external SQL database utilizing the data access library of choice. Examples include ADO.NET (OleDb, ODBC), Entity Framework, or any other chosen data interaction libraries. A precondition that the host computer is connected to the internet exists.

# Detailed Description of Components

