UAH Fit Vault Software Requirements Specification

CPE 656/658 Software Studio

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Revision History

Revision #	Revision Date	Description of Change	Author
0.1	9/14/15	Initial Draft	J. Duggan
0.2	9/15/15	Scope modifications	G. Riden
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		delete experiment, enable user, and disable user.	J. Duggan
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0.18	11/13/15	Created glossary of terms.	W. Sisulak
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0.21	12/6/15	Removed two requirements after team review.	J. Duggan

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Requirements Specification

1 Introduction

1.1 Purpose

The purpose of this document is to define the software requirements specification for UAH Fit Vault software projects. In addition, this document describes the scope, design constraints, and interfaces of the system. The intended audience for this document includes system developers, testers, customers, and any other stakeholders.

1.2 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. The software needs to able to take in files that a user has downloaded from their medical devices, process those 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 and allow for an activity to be assigned to them by date and time.

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.
- Simply display data that was uploaded to the customer in a graphical format.
- Calculate the user's activity.

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.

1.3 Definitions, Acronyms, and Abbreviations

Account	Roles and permissions assigned to a user and stored electronically
Activity	Action performed by patient (ex. running, walking, sleeping)
BasisPeak	Wearable medical device developed by the Basis company
csv	Comma-separated values
Customer	A person or group requesting the software to be built
dat	Data file
Data	Patient information
Database	Storage medium for patient data
Database Service	Database functionality accessible via the internet
ECG	Electro Cardio Gram
Experiment	Combining of data to generate a report based on input criteria
Experiment Admin	User of the system, able to run experiments on patient data
HTTP(S)	Hypertext Transfer Protocol (Secure)
IEEE	Institute of Electrical and Electronics Engineers
Interface	Medium in which a user interacts with the system
Microsoft Band	Wearable medical device developed by the Microsoft Corporation
Patient	User of the system, under the care of a physician
Physician	User of the system, treats patients
PII	Personally Identifiable Information
Query	Request for information based on parameters
Query Builder	Aids in building queries
SQL	Structured Query Language
Stakeholder	Anyone who has a stake in the outcome of the project
System Admin	User of the system, able to manage other user accounts
System Developer	An individual involved in the design and construction of a system
Tester	An individual involved in the testing of a system
UAH	The University of Alabama in Huntsville
User	Operator of the system
Medical Device	A device worn by a patient to collect medical data
Web Application	An application hosted on a server and accessible via the internet most commonly through a web browser
Web Based	Accessible via the internet utilizing HTTP/HTTPS
Web Browser	An interface to view web applications over the internet (example: Firefox, Internet Explorer)
Web Service	A software service accessible over the internet
Zephyr	Wearable medical device developed by Zephyr Pharmaceuticals

1.4 References

- IEEE Recommended Practice for Software Requirements Specifications (IEEE Std 830-1998)
- Microsoft Secure Passwords (https://www.microsoft.com/security/pc-security/password-checker.aspx)

1.5 Overview

The remainder of this requirements specification document addresses specific system requirements, constraints, and design specifications, as well as process plans and methods for the requirements specifications team.

2 Overall Description

2.1 Product Perspective

UAH Fit Vault is a web hosted system that provides the functionality described in the product functions section of this document. It includes subsystems to address all of the defined requirements. In addition, UAH Fit Vault includes interfaces to its web services platform and database services. These interfaces will be implemented according to industry standards.

2.2 Product Functions

- Web based and internet accessible.
- Medical experiment creation.
    - Store experiments for later viewing.
- Account Management including role-base user accounts.
    - Patient
    - Physician
    - Experiment Administrator
    - System Administrator
- Allows for confidential medical data storage.
- Allows for viewing medical data.
- Allows for Physician/Patient confidentiality.
- Provides a means to download experiment results and personal or patient medical data.
- Provides a user friendly interface.

2.3 User Characteristics

- Patient
    - Patient accounts shall not have any personal identifiable information

    - Since there is no PII, password resetting will be performed with either security questions or a temporary password will be mailed to a "call-back email"
    - Patient accounts shall contain information such as userid, username, password, age, gender, weight, height, race, nationality and location (at a high-level to not be identifiable, i.e. state)
    - Patients shall only be allowed to upload data and view their own data from one of the three wearable medical devices (see the *Non-Functional Requirements Section*).
- Physician
    - Will be able to add patients to the system.
    - Patients shall be associated with only one physician.
    - Physician accounts shall have information like username, password, active status and email.
    - Physicians shall be allowed to view the data for their associated patients.
- Experiment Administrator
    - People looking to gather health/fitness data on **anonymous** individuals that meet certain criteria (specific age, weight, race, etc.).
    - Experiment Administrators shall be able to specify criteria that they want to research and be provided data accordingly.
    - Experiment Administrators shall not be associated with any physician.
    - Experiment Administrators shall contain information such as a username, password, active status, etc.
- System Administrator
    - System administrators shall have the ability to enable, disable, add and remove all users except patients.
    - System administrators will have the ability to reset passwords.
    - System administrators shall be able to update physician, patient and experiment administrator account information.
    - System administrators shall not be allowed to view patient health data.

2.4 Constraints

- The software must be accessible on Microsoft Internet Explorer, Mozilla Firefox, Google Chrome, and Apple Safari. The follow table illustrates the minimum recommended version for each browser.

Internet Browser	Minimum Recommended Version

Google Chrome	v46
Mozilla Firefox	v41
Internet Explorer	v11
Apple Safari	v9.0.1

- Not all devices will provide the same types of data. The requirements listed below outline all the various data that is required to be displayed. However the software will not display data from a device if that device does not provide that type of data.

2.5 Assumptions and Dependencies

- The data provided by the devices are validated by the device prior to being introduced into our system. If a device's technical information states that data can only be between certain values, the software is assuming the device is exporting its data correctly.
- Advanced network security features preventing attacks such as DDoS will be put in place at a later date by either a system administrator or a future project team.
- Backup and recovery of this system will be provided by a system administrator and will not be a function of the system.
- Backup and recovery of the medical data records will be provided by a system administrator and will not be a function of the system.
- This system is dependent on a reliable connection to the computer that is hosting the web application server and database.

3 Specific Requirements

3.1. Functional Requirements

3.1.1. The system shall provide user authentication.

3.1.1.1 The users shall belong to one of the following roles.

3.1.1.1.1 Patient

3.1.1.1.1.1 At a minimum, the system shall store the following information about a patient accounts: unique patient id, username, password, age, weight, height, race, gender, and account status (enabled/disabled).

3.1.1.1.1.2 The system shall prevent any personal identifiable information from being available for a Patient

3.1.1.1.1.3 The system shall only allow a Patient to view their data.

3.1.1.1.2 Physician

3.1.1.1.2.1 At a minimum, the system shall store the following information about physician accounts: unique physician id, e-mail address, username, password, and account status (enabled/disabled).

3.1.1.1.2.2 The system shall allow a physician user to update the attributes associated with their account including e-mail address and password.

3.1.1.1.2.3 The system shall allow the physician user to view their patient's data graphically.

3.1.1.1.2.4 The system shall allow physician users to view only the data associated with their patients.

3.1.1.1.2.5 The system shall allow only a physician user to add a patient to the system.

3.1.1.1.2.6 The system shall allow a physician user to delete their patients from the system.

3.1.1.1.3 Experiment Administrator

3.1.1.1.3.1 At a minimum, the system shall store the following information about experiment administrator accounts: unique experiment administrator id, e-mail address, username, password, and account status (enable/disable).

3.1.1.1.4 System Administrator

3.1.1.1.4.1 At a minimum, the system shall store the following information about system administrator accounts: unique system administrator id, e-mail address, username, password, and account status (enable/disable).

3.1.1.1.4.2 System Administrators shall have the ability to enable, disable, add, and remove all users except patients.

3.1.1.1.4.3 System administrators shall have the ability to reset passwords.

3.1.1.1.4.4 System administrators shall be able to update physician, patient and experiment administrator account information.

3.1.1.2 The system shall require unique usernames for each registered user.

3.1.1.2.1 Usernames will be changeable as long as the username remains unique.

3.1.1.3 The system shall assign unique ids to each created patient.

3.1.1.3.1 The system shall display the patient id to the user that created the patients so that the user can keep a record of which patient corresponds to which id after account creation.

3.1.1.4 The system shall require a user account to have a password that meets minimum security criteria.

3.1.1.4.1 The system shall require the passwords to be a miniumum of 10 characters in length.

3.1.1.4.2 The system shall require the password to contain at least one uppercase and one lowercase letter.

3.1.1.4.3 The system shall require the password to contain at least one number.

3.1.1.4.4 The system shall require the system to contain at least one special character.

3.1.1.5 The user shall have the ability to log out of their account.

3.1.1.6 The system will have a utility for retrieving a forgotten username or password.

3.1.1.7 The system shall allow Physicians and Experiment Administrators to create their own accounts.

3.1.1.7.1 The system shall require a system administrator to verify the creation of a new Physician or Experiment Administrator.

3.1.1.7.2 Physicians shall create the accounts of their patients.

3.1.2. The system shall provide the ability to process medical device data files.

3.1.2.1 The system shall process multiple files at the same time or a single file.

3.1.2.2 The system shall provide the ability to assign an activity (ex. running, walking, sleeping) to the data by date and time.

3.1.2.3 The system shall give the user an interface to select which files to process and assign an activity to.

3.1.2.4 The system will not process data that is not medical data.

3.1.2.5 The system shall process comma-separated values (.csv) files for each of the supported devices.

3.1.2.6 The system will process raw data (.dat) files for each of the supported devices.

3.1.3. The system shall connect to a database.

3.1.3.1 The system shall upload the processed data to the database.

3.1.4. The system shall allow experiments to be created.

3.1.4.1 Experiments shall only be created by an experiment administrator.

3.1.4.1.1 Experiment administrators shall have the ability to save the experiments that they have created.

3.1.4.2 Experiment results shall be viewable by experiment administrators and physicians.

3.1.4.3 The system shall provide Experiment Administrators with a query builder used to create experiments.

3.1.4.4 The system shall allow Experiment Administrators and System Administrators to delete experiments.

3.1.5. The system shall allow data exporting.

3.1.5.1 The system shall allow experiment results to be exported.

3.1.5.1.1 The system will export experiment result graphs.

3.1.5.2 The system shall allow patients to export their data.

3.1.5.3 The system shall allow physicians to export the data of their patients.

3.1.5.4 The system shall provide comma-separated values (.csv) file exports.

3.1.6. The system shall provide account management.

3.1.6.1 The system shall allow account creation.

3.1.6.1.1 The system shall force account creation approval for both physicians and experiment administrators before their accounts become active for use.

3.1.6.1.2 Patients shall be active upon account creation.

3.1.6.2 The system shall allow users to edit account information.

3.1.6.3 The system shall allow only the system administrator to delete accounts.

3.1.6.4 Only a system administrator shall have the ability to enable accounts.

3.1.6.5 Only a system administrator shall have the ability to disable accounts.

3.1.7. The system shall provide a user interface for displaying medical data in the system.

3.1.7.1 The system shall provide a graphical display of accelerometer data.

3.1.7.2 The system shall provide a graphical display of breathing rate.

3.1.7.2.1 This following additional information regarding heart rate and ECG will be displayed if available: amplitude, noise, and data confidence.

3.1.7.3 The system shall provide a graphical display of heart rate and ECG data.

3.1.7.3.1 This following additional information regarding heart rate and ECG will be displayed if available: amplitude, noise, data confidence, and heart rate variability.

3.1.7.3.2 Breath to Breath intervals shall be displayed.

3.1.7.3.3 Beat to Beat intervals shall be displayed.

3.1.7.4 The system shall provide a graphical display of skin temperature.

3.1.7.5 The system shall provide a graphical display of an activity measurement.

3.1.7.6 The system shall provide a graphical display of peak acceleration.

3.1.7.7 The system shall provide a graphical display of posture data.

3.1.7.8 The system shall provide a graphical display of Galovanic skin resistance.

3.1.7.9 The system shall provide a graphical display of calorie data.

3.1.7.10 The system shall provide a graphical display of steps.

3.1.7.11 The system will provide a graphical display of gyroscope data.

3.1.7.12 The system shall provide a graphical display of UV index data.

3.1.7.13 The system shall provide a graphical display of speed data.

3.1.7.14 The system shall provide a graphical display of pace data.

3.1.7.15 The system will display Zephyr event data.

3.2 Non-Functional Requirements

3.2.1. The system shall run on Windows Server Operating System

3.2.2. The system shall use a SQL database.

3.2.3. The system shall require a server to be connected to a network with an internet connection.

3.2.4. The system shall support the data export from the following wearable medical devices.

3.2.4.1 Zephyr.

3.2.4.2 BasisPeak

3.2.4.3 Microsoft Band.

Appendices

Appendix A: Use Case Specifications

This section represents the use case specifications for the functions defined in the requirements specification for the two pieces of software needed to complete this project. The table below is a summary of the various use cases found in the diagram with link to their use case specification below.

Use Case Id	Use Case Name
UC_001	Select Data Files
UC_001a	Select Activity
UC_002	Process Data
UC_003	Validate Data
UC_004	Upload Data
UC_005	Login
UC_006	Logout
UC_007	Verify Login Credentials
UC_008	Create Account
UC_009	Edit Account
UC_010	Delete Account
UC_011	Approve Account
UC_012	Create Experiment
UC_013	View Experiment
UC_014	Delete Experiment
UC_015	Enable User
UC_016	Disable User
UC_017a	Physician: View Patient Data
UC_017b	Patient: View Patient Data
UC_018a	Physician: Export Patient Data
UC_018b	Patient: Export Patient Data
UC_019	Create Patient Account
UC_020	Delete Patient Account

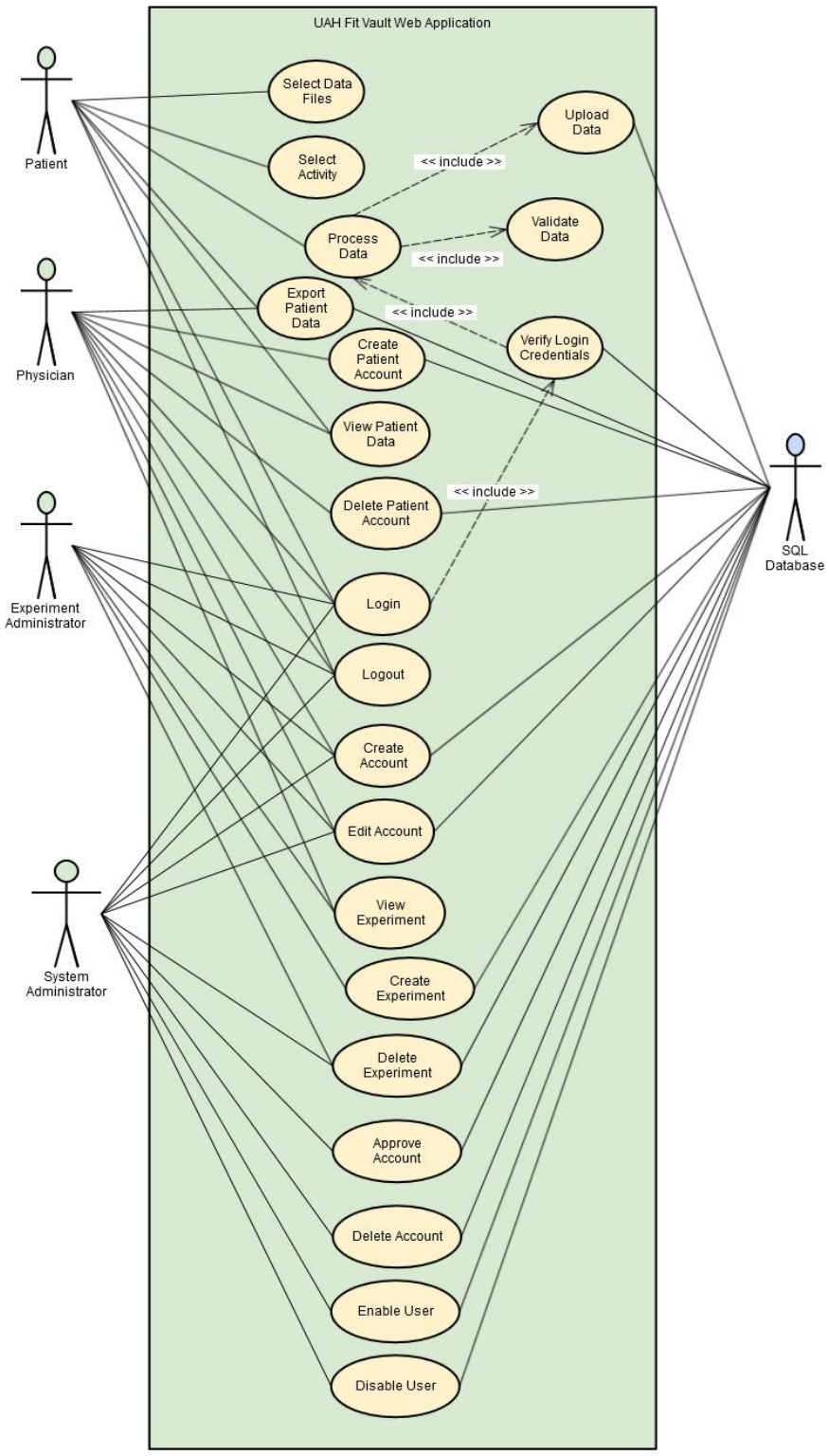

Figure A-1: Use Case Diagram

Use Case ID	UC_001	
Use Case Name	Select Data Files	
Actor(s)	Patient	
Purpose	Select the data file or files to be processed and uploaded to the database.	
Overview	The patient needs a way to select files to be uploaded	
Cross-References	*<requirements to be inserted here after finalized>*	
Pre-conditions	The patient has access to the software and is authenticated. The user has the appropriate permissions for importing data.	
Post-conditions	**PASS:** The files have been selected for processing. **FAIL:** No files are available for processing.	
Course of Events		
Actor Actions		**System Response**
1. Patient navigates to the directory of files they wish to process		
2. Patient selects all files they wish to upload.		
		2. The system loads the files.

Use Case ID	UC_001a
Use Case Name	Select Activity
Actor(s)	Patient
Purpose	Select the activity or activities for the data by date and time.
Overview	The patient needs a way to select an activity or activities to assign to the data.
Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	The patient has access to the software and is authenticated. The user has the appropriate permissions for importing data. A file or files have been selected.
Post-conditions	**PASS:** The files have been assigned and activity or activities. **FAIL:** No activity or activities were assigned.
Course of Events	
Actor Actions	**System Response**
1. Patient navigates to the directory of files they wish to process	
2. Patient selects all files they wish to upload.	
	2. The system assigns the activity or activities to the data by date and time.

Use Case ID	UC_002
Use Case Name	Process Data
Actor(s)	Patient
Purpose	Patient initiates file processing
Overview	The patient initiates the action to process the loaded files

Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	The files have been selected via UC_001 or UC_002. The user has been authenticated and has the appropriate permissions.
Post-conditions	**PASS:** The files are ready to be uploaded in to the database. **FAIL:** The files will not be uploaded to the database.
Course of Events	
Actor Actions	**System Response**
1. Patient initiates the file processing action.	
	2. The system processes the files.

Use Case ID	**UC_003**
Use Case Name	Validate Data
Actor(s)	System
Purpose	Validate processed data
Overview	The system validates the data being processed based on the device and medical data type.
Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	The files have been loaded via use case #1 or #2 and the processing step has been initiated. The user has been authenticated and has the appropriate permissions.
Post-conditions	**PASS:** The files are determined to be valid or invalid. **FAIL:** System error message displayed to the user informing that the files could not be processed.
Course of Events	
Actor Actions	**System Response**
1. The process data use case initiates the validation of the files.	
	2. The system validates the files.

Use Case ID	**UC_004**
Use Case Name	Upload Data
Actor(s)	System
Purpose	Upload data into the database
Overview	The software uploads the validated data into the SQL database.
Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	The data has been validated and is ready for the upload and the database is online. The user has been authenticated and has the appropriate permissions.
Post-conditions	**PASS:** The data is uploaded into the database. **FAIL:** An error message is displayed informing the user the upload failed.
Course of Events	
Actor Actions	**System Response**

1. The process data use case initiates the upload of the data	
	2. The system uploads the data into the SQL database.

Use Case ID	**UC_005**
Use Case Name	Login
Actor(s)	Patient, Physician, Experiment Administrator, System Administrator
Purpose	Procedure for logging into the system
Overview	The user needs to be able to login to the web application software in order to access the system.
Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	The user must have an account on the web site. The user has launched a web browser and navigated to the web application.
Post-conditions	**PASS:** The user has successfully logged into the system and can access various tools provided. **FAIL:** The user remains logged out of the system and cannot use the system.
Course of Events	
Actor Actions	**System Response**
1. User enters their user name and password on the login page.	
	2. The system validates their user credentials and logs the user into the system.

Use Case ID	**UC_006**
Use Case Name	Logout
Actor(s)	Patient, Physician, Experiment Administrator, System Administrator
Purpose	Procedure for logging out of the system.
Overview	From a security stand point the user shall have the ability to log them out of the web application to prevent unauthorized data entry if a computer is shared with another user.
Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	The user must have an account on the web site. The user has launched a web browser and navigated to the web application. The user is currently logged into the system.
Post-conditions	**PASS:** The user can no longer access the system. **FAIL:** The user remains logged into the system.
Course of Events	
Actor Actions	**System Response**
1. User selects the logout action.	

	2. The software deletes the user's login credentials from the application session.

Use Case ID	**UC_007**
Use Case Name	Verify Login Credentials
Actor(s)	Patient, Physician, Experiment Administrator, System Administrator
Purpose	Procedure for verifying the login credentials of a user.
Overview	The username and password entered by the user must be validated prior to granting the user a successful login into the system.
Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	The user must have created an account on the web site. The user has launched a web browser and navigated to the web application.
Post-conditions	**PASS:** The user has been logged into the system. **FAIL:** The user remains logged out of the system and an error message is present to the user informing that there was an invalid username or password entered.
Course of Events	
Actor Actions	**System Response**
1. User enters username and password into the login modal dialog.	
	2. The software queries the account table in database to authenticate the user.

Use Case ID	**UC_008**
Use Case Name	Create Account
Actor(s)	Physician, Experiment Administrator, System Administrator
Purpose	Procedure for creating a new account in the system
Overview	A new user wishing to use the system must register a new account using the web application account creation tools.
Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	User must have an active internet connection. User must have accessed the web application through a browser on their personal computer.
Post-conditions	**PASS:** New user account has been created and is pending approval. **FAIL:** No new account is created and an error message is displayed to the user.
Course of Events	
Actor Actions	**System Response**
1. User selects link from login screen to register a new user.	

	2. The system loads the account creation page for the user.
3. User enters all information required.	
	4. The system creates and account and sends an approval notification to the system administrators to approve the new account.

Use Case ID	**UC_009**
Use Case Name	Edit Account
Actor(s)	Physician, Experiment Administrator, System Administrator
Purpose	Procedure for editing an existing account in the system
Overview	In the event the user needs to edit any of their account information the system will allow the user to do so from the account management view.
Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	User must have an active internet connection. User must have accessed the web application through a browser on their personal computer. User must be logged into the system. User must be navigate to the account management page.
Post-conditions	**PASS:** User account information has been updated. **FAIL:** User account remains the same.
Course of Events	
Actor Actions	**System Response**
1. User enters any changes into the account management view.	
2. User selects to save changes.	
	3. The system updates the user's account with the updated account information provided by the user.

Use Case ID	**UC_010**
Use Case Name	Delete Account
Actor(s)	System Administrator
Purpose	Procedure for deleting an existing user account.
Overview	When a user account is no longer active or needed a request can be made to the system administrators to delete user accounts.
Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	System administrator must have an active internet connection. System administrator must have accessed the web application through a browser on their personal computer. System administrator must be logged into the system. Account deletion has been requested.

Post-conditions	**PASS:** User account has been removed from the system. **FAIL:** User account remains the in the system.
Course of Events	
Actor Actions	**System Response**
1. System administrator navigates to their admin tools.	
2. System administrator clicks the delete button for the account.	
	3. The system provides a verification dialog asking the system administrator if they are sure they wish to delete the account.
4. System administrator clicks the “Yes” options.	
	5. The system deletes the user.

Use Case ID	**UC_011**
Use Case Name	Approve Account
Actor(s)	System Administrator
Purpose	Procedure for approving the creation of a new account.
Overview	After a user creates a new account a system administrator must approve the new account prior to it becoming active for use.
Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	System administrator must have an active internet connection. System administrator must have accessed the web application through a browser on their personal computer. System administrator must be logged into the system. A new account has been created pending approval.
Post-conditions	**PASS:** User account is now active and the user can now access the various tools in the system. **FAIL:** User account does not have access to any system tools.
Course of Events	
Actor Actions	**System Response**
1. System administrator navigates to their admin tools.	
2. System administrator clicks the approve button for any pending accounts.	
	3. The system unlocks the account and allows the user to access the system.

Use Case ID	UC_012
Use Case Name	Create Experiment
Actor(s)	Experiment Administrator
Purpose	Procedure for creating a new experiment.
Overview	An experiment administrator may build experiments based on the data that is available in the system.
Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	Experiment administrator must have an active internet connection. Experiment administrator must have accessed the web application through a browser on their personal computer. Experiment administrator must be logged into the system.
Post-conditions	**PASS:** A new experiment has been created. **FAIL:** No experiment has been created.
Course of Events	
Actor Actions	**System Response**
1. Experiment administrator navigates to the experiment module.	
	2. The system creates a copy the various types of data from the database and builds a set of lists that can be used to build an experiment.
3. Experiment administrator uses the tools provided to build an experiment.	
	4. The system displays the results of the experiment.
5. Experiment administrator selects to save the experiment.	
	6. The system saves the experiment so it can be run again later.

Use Case ID	UC_013
Use Case Name	View Experiment
Actor(s)	Physician, Experiment Administrator
Purpose	Procedure for viewing an existing experiment's results.
Overview	Once an experiment has been created, it will be viewable again from an existing experiments list.
Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	User must have an active internet connection. User must have accessed the web application through a browser on their personal computer. User must be logged into the system.
Post-conditions	**PASS:** Experiment results are displayed to the user. **FAIL:** Error message is displayed instead of experiment results.

Course of Events	
Actor Actions	**System Response**
1. User navigates to experiment module.	
2. User selects experiment to view from a list of existing experiments.	
	3. The system displays the experiment results to the user.

Use Case ID	UC_014
Use Case Name	Delete Experiment
Actor(s)	Experiment Administrator, System Administrator
Purpose	Procedure for deleting an experiment.
Overview	In the event that an experiment is no longer needed it can be deleted from the system.
Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	User must have an active internet connection. User must have accessed the web application through a browser on their personal computer. User must be logged into the system.
Post-conditions	**PASS:** Experiment has been removed from the system. **FAIL:** Experiment remains in the system.
Course of Events	
Actor Actions	**System Response**
1. User navigates to experiment admin module.	
2. User clicks the delete button for an experiment.	
	3. The system deletes the experiment.

Use Case ID	UC_015
Use Case Name	Enable User
Actor(s)	System Administrator
Purpose	Procedure for enabling a disabled user.
Overview	If a user has been disabled, a system administrator can enable the user from the system administrator tool.
Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	User must have an active internet connection. User must have accessed the web application through a browser on their personal computer.

	User must be logged into the system.
Post-conditions	**PASS:** User account is now enabled. **FAIL:** User account remains disabled.
Course of Events	
Actor Actions	**System Response**
1. System administrator navigates to admin module.	
2. System administrator clicks the enable button for the disabled user.	
	3. The system enables the user account.

Use Case ID	**UC_016**
Use Case Name	Disable User
Actor(s)	System Administrator
Purpose	Procedure for disabling an active user.
Overview	If a user can request to a system administrator that a user account be disabled.
Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	User must have an active internet connection. User must have accessed the web application through a browser on their personal computer. User must be logged into the system.
Post-conditions	**PASS:** User account is now disabled. **FAIL:** User account remains enabled.
Course of Events	
Actor Actions	**System Response**
1. System administrator navigates to admin module.	
2. System administrator clicks the disable button for the active user.	
	3. The system disables the user account.

Use Case ID	**UC_017a**
Use Case Name	Physician: View Patient Data
Actor(s)	Physician
Purpose	The physician needs to view their patient's data.
Overview	The physician's patients have uploaded their data to the system. The

	physician needs to be able to select and view that data for review.
Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	The patient has uploaded the data to the system. The physician must be logged in.
Post-conditions	**PASS:** The physician is able to view the patient data. **FAIL:** The patient data fails to display.

Course of Events	
Actor Actions	**System Response**
1. The physician selects the "View Data" option from the menu.	
	2. The system displays a list of the physician's patients.
3. The physician selects the desired patient to display the data for.	
	4. The system displays a list of dates and times for which to show the data.
5. The physician selects a desired date and time to show the data for.	
	6. The system displays a chart showing the selected data.

Use Case ID	**UC_017b**
Use Case Name	Patient: View Patient Data
Actor(s)	Patient
Purpose	The patient needs to view their data.
Overview	A patient wants to view the data that they have uploaded to the system to view the data they have collected about themselves.
Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	The patient has uploaded the data to the system. The patient must be logged in.
Post-conditions	**PASS:** The patient is able to view the patient data. **FAIL:** The patient data fails to display.

Course of Events	
Actor Actions	**System Response**
1. The patient selects the "View Data" option from the menu.	
	3. The system displays a list of dates and times for which to show the data.
3. The patient selects a desired date and time to show the data for.	
	4. The system displays a chart showing the selected data.

Use Case ID	UC_018a	
Use Case Name	Physician: Export Patient Data	
Actor(s)	Physician	
Purpose	The physician needs to export their patient data.	
Overview	The physician may need to export a patient data for other data processing or the ability to send the data to another party.	
Cross-References	*<requirements to be inserted here after finalized>*	
Pre-conditions	The patient has uploaded the data to the system. The physician must be logged in.	
Post-conditions	**PASS:** The data is successfully exported to the physician. **FAIL:** An error occurred while exporting the data.	
Course of Events		
Actor Actions		**System Response**
1. The physician selects the “Export Data” option from the menu.		
		2. The system displays a list of the physician’s patients.
3. The physicians selects the desired patient to view the data for.		
		4. The system displays a list of date and times for which to export the data for.
5. The physician selects the desired data uploads to export.		
		6. The system generates a comma-separated values (csv) file containing the desired data and allows the physician to download it.

Use Case ID	UC_018b	
Use Case Name	Patient: Export Patient Data	
Actor(s)	Patient	
Purpose	The patient needs to export their data.	
Overview	A patient may wish to export their medical data for their own use or for back up.	
Cross-References	*<requirements to be inserted here after finalized>*	
Pre-conditions	The patient has uploaded the data to the system. The patient must be logged in. The patient has selected data to view.	
Post-conditions	**PASS:** The data is successfully exported to the physician. **FAIL:** An error occurred while exporting the data.	
Course of Events		
Actor Actions		**System Response**
1. The patient selects the “Export Data” option from the menu.		
		2. The system displays a list of date and times for

	which to export the data for.
3. The patient selects the desired data uploads to export.	
	4. The system generates a comma-separated values (csv) file containing the desired data and allows the physician to download it.

Use Case ID	**UC_019**
Use Case Name	Create Patient Account
Actor(s)	Physician
Purpose	The physician adds a patient to the system.
Overview	The physician needs to be able to add patients to the system.
Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	The physician is logged in.
Post-conditions	**PASS:** The patient account was created successfully. **FAIL:** The patient account failed to create.
Course of Events	
Actor Actions	**System Response**
1. The physician selects the "Add Patient" option from the menu.	
	2. The system displays the form to create a patient.
3. The physician fills in the create user form and clicks on the submit button.	
	4. The system displays if the user was created successfully or not. The system should also display the temporary password for the user and the user ID.
5. The physician records the generated user ID for the associated patient and the patient's real identity in an external area.	

Use Case ID	**UC_020**
Use Case Name	Delete Patient Account
Actor(s)	Physician
Purpose	The physician deletes a patient from the system.
Overview	The physician needs to be able to delete former patients from the system.
Cross-References	*<requirements to be inserted here after finalized>*
Pre-conditions	The physician is logged in.
Post-conditions	**PASS:** The patient account was deleted successfully. **FAIL:** The patient account failed to delete and remains in the system.
Course of Events	

Actor Actions	System Response
1. The physician selects the “Delete Patient” option from the menu.	
	2. The system displays a list of the physicians patients.
3. The physician selects the patient(s) to delete.	
	4. The system displays a model dialog asking the physician to confirm that he or she wishes to delete the patient(s).
5. The physician confirms the deletion.	
	6. The system removes the patient(s) from the system.

Appendix B: Traceability Matrix

TraceabilityMatrix.xlsx