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| UAHealth Bit Vault Software Test Plan |
| CPE 656/658 Software Studio |
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# Revision History

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| Revision # | Revision Date | Description of Change | Author |
| 0.1 | 10/11/15 | Initial Draft | T. Wilkins |
| 0.2 | 10/12/15 | Added cover page, revision history, headers, and footers. | J. Duggan |
| 0.3 | 10/13/15 | Added section 4.2.5 | T. Wilkins |
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Software Test Plan

# Introduction

This document shall be used to create a test plan for the medical project.

## Objectives

The main objective of this document is to come up with all the necessary parts of a fully-fledged test plan. This includes identifying the scope of testing that will be done, identifying any references needed to perform the testing, defining the environment in which the tests will be run, and identifying the classifications of the tests themselves. This document will also explore any risks involved with meeting the test plan. Approvals will be noted at the end of the document.

# Scope

## Identification

This test plan covers the testing of two key pieces of software, the data collection software and the data analysis software. All testing outlined in this document must be run against the final version of these software. The final version of the application containing both pieces of software that passes all testing shall be known as version UAHealth Bit Vault 1.0.

## System Overview

The medical project will consist of two pieces of software. The first being a data collection tool, and the second being software that will be used to analyze data collected into a database by the first tool. The two pieces of software are described below.

The data collection portion of this project will consist of the following. There are several different medical devices to be used 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 data files from the device will likely be exported in one zip file that will need to be extracted and processed, however the contents of the zip files will vary. The software will have to determine the contents of the zip file and how to process the files within. Due to how long data transfers take to download the data from a device, there may be a need 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 and be able to translate them in a way where they can be stored in a database. The software needs to run in the background of a PC and wait for files that need to be processed. The software will have to interact with a database to insert the data that has been processed in order for the data to be stored for later analysis. The software should allow for some basic configuration such as designating a folder on the PC to be a listener. Files moved or copied into this folder will be processed by the software when they are added. The software should have the ability to process multiple zip files if more than one is placed into the processing folder at a time.

Data analysis software needs to be created to analyze the data that is captured from the data collection tool mentioned above. This piece of software will be a separate stand-alone application that may need to be implemented within the current UAH Medical Web Portal. 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.

## Document Overview

This document contains information relevant only to the software, testing, and planning associated with such. None of the material in this document is to contain actual names, medical data, or information about actual people living or dead. Medical information is private and no actual data from actual people will be included in this document. As such, this document may be distributed freely and made publicly available.

## Relationships

This document is closely related to the Software Development Plan (SDP). As the SDP is created, this document will need to be maintained to keep its relevance. Any tests described by this document will be closely related to the features, classes, or functions described in the SDP and thus as these elements are updated or changed, this document will need to be updated or changed. Updates to this document will be under revision control as described in the Configuration Management Plan.

# References

# Software Test Environment

This section describes the test environment. There will be 2 test environments. One for the data collection software and another for the data analysis software.

## Data Collection Test Environment

### Software

Tools to be used during testing of the data collection software are listed below. A detailed description of the tool, its intended use, where or who to get it from and any other relevant details are below. These will be added to as we develop the design. As the design changes new or different tools may become necessary.

* Visual Studio (x.x.x) – This tool will be utilized for local development of the software, but also development and execution of unit tests. Visual Studio x.x.x and the unit test plugin can be obtained here: \*\*\* and \*\*\*.
* Windows 7 – This will be the developing OS. All development and testing should be performed on this OS for this piece of software.
* GitHub – This is the repository software to be used to store all tests.
* Mock Database – This has not been decided upon yet, but there will need to be a mock database of some sort to test the data collection software against. It will be the responsibility of the team to find or create this tool.
* Mock DBHandler – This has not been decided upon yet, but there will need to be a mock database handler of some sort to test the data collection software against. It will be the responsibility of the team to find or create this tool.
* Mock FileObject – This has not been decided upon yet, but there will need to be a mock file object of some sort to test the data collection software against. It will be the responsibility of the team to find or create this tool.
* Mock GUI – This has not been decided upon yet, but there will need to be a mock GUI of some sort to test the data collection software against. It will be the responsibility of the team to find or create this tool.

### Hardware and Firmware

Hardware to be used during testing of the data collection software is listed below. A detailed description of the hardware, its intended use, where or who to get it from and any other relevant details are below.

* PC – a PC will be required for testing. This will be the responsibility each team member to provide for himself.
* Internet Connection – an internet connection will be required for saving and retrieving the tests. It is also the responsibility of each team member to provide this for himself.

### Other Materials

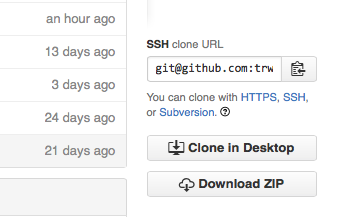
Any other materials to be used during testing of the data collection software are listed below. A detailed description of the material, its intended use, where or who to get it from and any other relevant details are below.

* Mock patient data – This is made up data that can be imbedded in the tests for automation purposes. This is to be provided by the team.

### Proprietary Nature, Acquirer’s Rights, and Licensing

### Installation, Testing, and Control

Each team member shall be responsible for downloading and installing Visual Studio (x.x.x). Visual studio can be downloaded here \*\*\* and installation instructions can be found here \*\*\*. Windows 7 with service pack \*\*\* is to be provided by the team member. Code under test and the tests themselves can be downloaded off of GitHub. GitHub is located at [www.github.com](http://www.github.com). Code and tests can be downloaded to a system for testing purposes by clicking the “Clone in Desktop” button as seen below on the GitHub project page.



All the mocks will need to be developed. There should be a mock of all the classes needed in order to get the minimum required code and path coverage into unit tests. These mocks should be developed at the same time or before the classes they are needed to test.

A PC is required to be provided by each team member for testing. Each team member will also need an Internet connection in order to download the tests and code under test.

GitHub and the Internet connection are under test and control by the provider. Windows 7 and Visual Studio are under test by third parties and the versions are under control by the configuration management plan. The PC is assumed to be working and maintained by the team member.

### Participating Organizations

Organizations involved in the testing of the data collection software are listed below. Their roles are described with each role.

* Med656 Team – The Med656 team will be responsible for writing unit tests, acceptance tests, and running both of them.
* Customer – The customer will be responsible for customer acceptance tests.

### Personnel

N/A – Entier team will be involved in the test process.

### Orientation Plan

All team members are to go through the following tutorials for training purposes:

* <https://www.atlassian.com/git/tutorials/comparing-workflows/gitflow-workflow>
* Visual Studio:
* C#:

### Tests to be Performed

## Data Analysis Test Environment

### Software

Tools to be used during testing of the data analysis software are listed below. A detailed description of the tool, its intended use, where or who to get it from and any other relevant details are below. These will be added to as we develop the design. As the design changes new or different tools may become necessary.

* Visual Studio (x.x.x) – This tool will be utilized for local development of the software, but also development and execution of unit tests. Visual Studio x.x.x and the unit test plugin can be obtained here: \*\*\* and \*\*\*.
* Ubuntu Server 14.04.3 LTS – this will be the OS for development and deployment of the Data Analysis software. All tests written for this software must be able to be run on this OS. It can be downloaded here: <http://www.ubuntu.com/download/server>
* GitHub – This is the repository software to be used to store all tests.
* Mocks – Mocks of each of the classes will be created as needed in order to run unit tests.

### Hardware and Firmware

Hardware to be used during testing of the data collection software is listed below. A detailed description of the hardware, its intended use, where or who to get it from and any other relevant details are below.

* Server – The customer will provide the server hardware. The hardware shall meet these specs: \*\*\*. This will be the hardware the data analysis software is installed on and the location the tests for the data analysis software are run from.
* Internet Connection – The customer shall provide an Internet connection to the Server. This will be necessary to download the code and tests.
* Remote Access – The customer shall provide a mechanism for accessing the server remotely.

### Other Material

Any other materials to be used during testing of the data collection software are listed below. A detailed description of the material, its intended use, where or who to get it from and any other relevant details are below.

* None.

### Proprietary Nature, Acquirer’s Rights, and Licensing

### Installation, Testing, and Control

See section 4.1.5 for instructions for installation, testing and control procedures related to Visual Studio and GitHub. Ubuntu Server 14.04.3 LTS will be installed by a team member onto the server provided by the customer. The installation shall be assumed to be tested if the installation completes with no major errors. There will be no updates made to the server OS.

Mocks shall be developed by the team as needed to perform unit testing. Testing of these Mocks will consist of ¾ of the team approving the inputs and outputs of the Mocks. All changes to the Mocks shall also require ¾ team approval.

The server is to be provided by the customer. Installation, testing, and control of the server shall remain in the customer domain. Issues related to the server will be brought to the customer to be addressed.

The internet connection to the server is to be provided by the customer. Installation, testing, and control of the internet connection shall remain in the customer domain. Issues related to the internet connection will be brought to the customer to be addressed.

The remote access to the server is to be provided by the customer. Installation, testing, and control of the remote access shall remain in the customer domain. Issues related to the remote access will be brought to the customer to be addressed.

# Test Identification

## General Information

### Test Levels

### Test Classes

### General Test Conditions

### Test Progression

### Data Recording, Reduction, and Analysis

## Planned Tests

### Items to be Tested

### Project-unique Identifier of a Test

# Test Schedule

# Requirements Traceability

# Notes

# Annexes

# Risks

## Schedule

## Technical

## Management

## Personnel

## Requirements

# Approvals