Table 1: Revision History

Date	**Developer(s)**	**Change**
Date1	Name(s)	Description of changes
Date2	Name(s)	Description of changes
...	...	...

Hazard Analysis
Mechtronics Enigeering

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1 Introduction

2 Component Overview

The project can be divided into five different main components. Those components are listed in the paragraphs below.

2.1 Movement of Camera

2.2 Human Body Detection

A good detection method should be used so that the human body can be detected by the program in the images provided by the camera. The movement of the human body shoudl also need to be detected to help the camera to judge its angular position.

2.3 User Interface

This component provides a communication layer between the system and the user through a computer app.

2.4 Database

2.5 Objection Detection

This system is responsible for detecting any moving object in the area and identifying each object with unique set of characteristics. The is the main logical system for smartVault to help locate a “lost” item.

3 Safety Considerations and Connection with Requirements

3.1 Movement of Camera

3.2 Human Body Detection

3.2.1 Human Body Detection Failure

When a human presents in the room and the images have been shown in the computer, the program fail to detect the human body in the screen or wrong object detected by the software and identified as ”Human”.

3.2.2 Body Movement Detection Failure

When people moves in the room and the images has been sent to the computer, the program cannot detect the movement of the body or the movements of other objects are identified as buman body movements.

3.3 User Interface

3.3.1 General

App closes unexpectedly, it could lead to the loss of current progress.

3.3.2 Login In Issue

User cannot log in to the app successfully, such that he/she do not have the ability to interface with the system.

3.3.3 Authentication

An unauthorized user logs in as a privileged user with high-level access.

3.4 Database

3.5 Object Detection

SmartVault will return error message when connection between camera and the object detection system is lost. When connection is lost, object detection system will not be able to monitor moving objects.

4 FMEA Worksheet

Table 1: The FMEA Table

Components	Failures	Cause of Failure	Recommended Action
Movement of Camera	N	N	N
Human Body Detection	Human Body not Detected	a. Detection method failure b. Wrong posture of human	a. Restart the program b. request help from development team
	Wrong Human Body Detected	a. Detection method failure	a. Restart the program b. Request help from development team
	Body Movement not Detected	a. Detection method failure b. Human body moves too fast	a. Restart the program b. Request help from Development team
	Wrong Body Movement Detected	a. Detection method failure	a. Restart the program b. Request help from development team
General	App closes unexpectedly	a. Host device loses power b. Crash due to instabilty	a. Store unsaved data locally on user's device
Login In Issue	User cannot log in to the app successfully	a. User's credentials are unmatched	a. Reset user's credentials
Authentication	An unauthorized user logs in as a privileged one with high-level access	Authentication issue	a. Fix the account permission and undo changes made by unauthorized user
Database	N	N	N
Object Detection	N	N	N

Failure Mode and Effects Analysis							
Components	**Failure Modes**	**Causes of Failure**	**Effects of Failure**	**Severity**	**Recommended Actions**	**SR**	**Ref**
Movement of Camera	NA	a. NA b. NA	a. NA b. NA	a. NA b. NA	a. NA b. NA	NA	H3-1
	NA	NA	NA	NA	NA	SR6	H3-2
Human Body Detection	Human body detection failure	a. Detection method Failure b. Wrong Human Body Detected c. Wrong postures of human body	a. Wrong position description of the objects	High	a. Restart the program b. Compare detected body with human body database stored inside the system	IPR1	H3-1
	Body movement detection failure	a. Detection method failure b. Wrong movement detected	Hard to associate movement of objects with movement of human body	High	a. Retart the program b. Rejudging movement zone around the human body	IPR4	H3-2
User Interface	App closes unexpectedly	Host device loses power, or Crash due to instabilty	Current progress is lost	High	a. Store unsaved data locally on user's device	NA	NA
	User cannot log in to the app successfully	User's credential is unmatched	User is unable to use the system	High	a. Reset user's credentials	NA	NA
	An unauthorized user logs in as a privileged one with high-level access	Authentication issue	User could view or modify data even he/ she is not allowed	Strongly high	a. Fix the account permission and undo changes made by unauthorized user	NA	NA
Database	NA	a. NA b. NA	a. NA b. NA	a. NA b. NA	a. NA b. NA	NA	H3-1
	NA	NA	NA	NA	NA	SR6	H3-2
Object Detection	NA	a. NA b. NA	a. NA b. NA	a. NA b. NA	a. NA b. NA	NA	H3-1
	NA	NA	NA	NA	NA	SR6	H3-2

Table 2: FMEA Table Part 1