

1 Introduction: Part 1

1.1 PROBLEM STATEMENT

What problem is your project trying to solve? Use non-technical jargon as much as possible. You may find the Problem Statement Worksheet helpful.

Post Traumatic Stress Disorder (PTSD) is a mental health issue that affects about 8 million people in America today. PTSD can affect anyone who has been through a significantly traumatic experience. It is diagnosed by assessing both the symptoms' duration and the impact of these symptoms on the quality of life of the individual. PTSD does not look the same for every person, but some common symptoms and related problems when PTSD goes untreated are listed below:

Symptoms:

1. Reliving the event
2. Avoidance
3. Negative thoughts and feelings towards oneself and others
4. Hyperarousal (mood swings, concentration issues)
5. Severe Anxiety

Related Problems:

1. Depression
2. Chronic Pain
3. Sleep problems
4. Substance misuse
5. Suicide

Although PTSD can affect many different types of people ranging from children to adults, PTSD is a notably significant mental issue affecting active-duty service members and veterans. Veterans have an increased chance of being diagnosed with PTSD when compared to civilians due to the potential for war-zone deployment, training accidents, and military sexual trauma. The related problems of depression, substance misuse, and suicide can result as a consequence of prolonged exposure to trauma, which happens each time a person relives the traumatic event during a PTSD attack. Therefore, decreasing the severity, duration, and frequency of PTSD attacks is vital for improving the outcomes of people suffering from PTSD.

Our customer, America's VetDogs, provides trained PTSD service dogs free of charge for qualified veterans, active-duty service members, and first responders to enhance their mobility, foster renewed independence, and increase the possibilities of day to day activities. These dogs improve the quality of life of the person by providing invaluable comfort that can decrease the severity and duration of a PTSD attack once detected. However, these service dogs cannot detect PTSD attacks quick enough to avoid the attack completely, and eliminating or preventing attacks altogether would be ideal.

America's VetDogs in partnership with BAE Systems, wants us to design and develop a device that monitors a spike in an individual's heart rate and blood pressure before a PTSD episode begins. The device will be paired with another device located on the service dog's vest to wirelessly alert the dog to the veteran's

distress so the dog can provide the veteran with comfort in-turn. This alert however must be discrete and timely in order to facilitate a proper response from the service dog.

1.2 INTENDED USERS AND USES

Who will use the product you create? Who benefits from or will be affected by the results of your project? Who cares that it exists? List as many users or user groups as are relevant to your project. For each user or user group, describe (1) key characteristics (e.g., a persona), (2) need(s) related to the project (e.g., a POV/needs statement), and (3) how they might use or benefit from the product you create. Please include any user research documentation, empathy maps, or other artifacts as appendices.

The device we develop will be used by veterans, active-duty service members, and first responders such as firefighters, police officers, and emergency medical technicians that have service dogs. In addition, anyone who has experienced PTSD induced by traumas such as physical, sexual, and psychological abuse and also has a service dog can benefit from this device.

Characteristics of these groups have a lot of overlap. These groups deeply value independence and the ability to serve others. They value being active members of society, physically active people, protecting people from danger, and hard work. These values are important to recognize because PTSD attacks can affect their ability to comfortably exemplify these values due to the symptom of avoidance.

Although this device is targeted to helping people with PTSD, another user of this device is the service dog. The service dog will assist them when the PTSD episode begins, shortening the duration. For example, the service dog will offer comfort to calm and control their breathing when the dog's device gets an attack in progress alert remotely from the user worn device.

The user of this device needs it to be quick in detection of a PTSD moment as soon as it begins in order to have the dog react fast enough to cooldown the event. The user would also need this device to be relatively comfortable on both them and the dog given that this device will most likely be on their person a majority of the day.

One of the many benefits of this product is that it shortens the response time for the dog to react to assisting the individual with PTSD. Another benefit to the individual with PTSD is that it gives them more confidence and assurance just by having a device in addition to their dog that in the case of a PTSD moment occurring, they know that there is something there to detect it before they know it. If for some reason the dog is not near or is asleep, the dog will be notified of the PTSD attack and can assist the owner. Lastly, having a device like this can help track when, where, and perhaps why the PTSD symptoms are occurring. Having this information can possibly help further research and understand the specific individual's triggers.

Research Articles:

<https://www.nimh.nih.gov/health/publications/post-traumatic-stress-disorder-ptsd>

<https://www.ptsd.va.gov/index.asp>