

Calculations of PTSD Disability Benefits for Veterans

I. Problem

Depending on service era, 10-30% of US veterans experience PTSD, a mental health condition caused by witnessing and experiencing terrifying events (https://www.ptsd.va.gov/understand/common/common_veterans.asp). The Department of Veterans Affairs, specifically the Veterans Benefits Administration (VBA) provides programs and services to veterans and their survivors, including a program specifically addressing PTSD. However, often applying for these benefits is a slow and tedious process, taking on average 10 months.

There are three parties involved in the PTSD disability calculation process: veterans, physicians, and VBA analysts. These are the assumptions we make in our solution: The veteran submits a claim, consisting of an application and a medical exam to the VBA. A physician is required to fill out and submit the medical exam. The VBA analyst reviews the claim and assigns a “rating” as to the validity and severity of PTSD, which is number from 0 to 100. Then, based on this rating, the analyst awards the veteran with a compensation amount. The inputs are the application and exam and the output is a compensation amount.

II. Solution

Our solution was inspired by an ongoing project that currently calculates benefits for veterans affected with hearing loss. This project can be found [here](#). We decided to model our solution in the way that would integrate seamlessly with the current hearing loss implementation. That is, we have 3 dashboards: [veteran](#), [physician](#), and [evaluator](#). Each dashboard updates automatically with updates from other dashboards- that is, when the veteran fills out their application and requests the exam, the physician is able to fill out the veterans exam, and the evaluator can examine the completed claim (application and exam) and assign a corresponding compensation value. Note that the system generates a recommended compensation value based on the claim.

To achieve our goal, we organized the project into 3 goals: calculator based on laws, collaborative dashboards, and user interface. For the calculator to determine the recommended compensation value, we inspected [legal documentation](#), which provided us a way to map certain PTSD symptoms to scores based on their severity. We then coded the symptoms into a ruleset, and used the most severe symptom to assign a rating to the claim (for example if a physician marks a “30” value symptom and a “100” value symptom, we take the max and would assign a rating of 100). For collaborative dashboards, we made sure the corresponding dashboards update correctly with each step of the process. When the veteran submits a request for an exam, we see that their request is immediately visible on the physician’s dashboard.

Lastly, our UI was largely the same as the current version for hearing loss- we wanted them to match to create consistency for the future. One point worth noting is our order of the checklist for the physician's dashboard-- we somewhat arbitrarily ordered the symptoms but we believe that the ordering may/should matter. Possibly we should reorder the symptoms to progress from less to more severe as the physician reads down the list.

Something that consistently did not work- and that we found incredibly bizarre- is the checkbox for a single symptom: "flattened affect." For reasons unbeknownst to us, the veteran is able to check any of the symptoms except this one. We were unable to find the cause of this, as this symptom was integrated into the UI in the same manner that we did the rest of the symptoms.

III. Decision Making

Our main focus for this project was to be able to integrate it effectively into the current system that handles hearing loss. Our ideal end goal for the future would be to create a system that handles all types of medical claims, not just hearing loss and PTSD. Therefore, we decided to model our UI to match that of the hearing loss system.

To calculate our recommended compensation for the claim (or the severity of the PTSD), we took into account the severity of the symptoms that were selected. That is, symptoms are organized into categories, where each category maps to a certain value based on severity. Veterans select their symptoms, and we assign the severity value based on the most severe symptom selected (we essentially take the ceiling of all of the symptoms scores).

IV. Logic Programming

Logic programming provided a very elegant way to establish this system. It is by no means necessary, but without it, the source code would have been significantly longer for this project, and full of conditional statements. In addition, logic programming was especially desirable for this project, since it made the laws easily codified. We also thought it was a good decision as far as the medical exam was concerned because we could attribute a specific rating to each symptom, which allowed us to easily calculate the corresponding compensation.

V. Scalability

In the future, we would like to fix the puzzling "flattened affect" bug mentioned above, so that it is able to be selected. The most desirable extension for the future, however, would be to extend the system to a wide variety of medical conditions that veterans can file claims for. That is, the end product would be a centralized system for the VBA to use for all medical claims for veterans, greatly streamlining a very complicated and tedious process. We also want to expand our system to integrate datasets about events that have occurred in the military- to vet claims for PTSD, the veteran must claim a specific event or series of events that would have caused it, so we'd want to make the cross checking of the veteran's claims with the actual incident dataset seamless. Eventually, we believe it is possible to fully automate this process.