Stress Shield

Project Requirements and Specifications

Precision Edge Performance

The Shield-Bearers

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I. Introduction

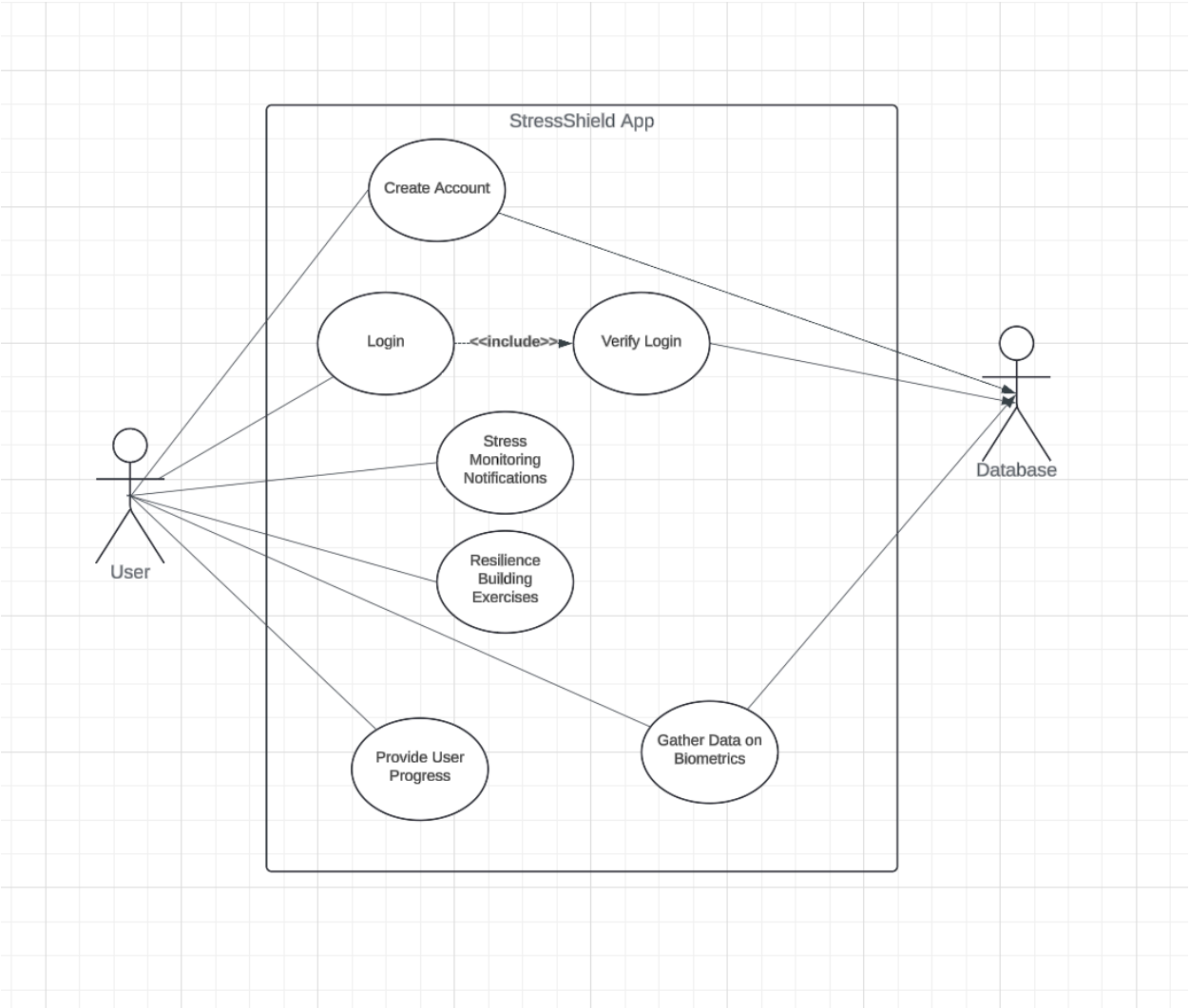
Today, around 30% of all first responders develop behavioral health conditions including PTSD, depression and severe anxiety [5]. This is not surprising, considering the intense challenges first responders face daily. Effectively managing stress is a critical but often underappreciated skill that every first responder must master. Their ability to perform at their best in emergencies depends on maintaining a clear state of mind, even in the most chaotic situations.

Despite the potential, technology's role in supporting the mental health of first responders has been largely overlooked. That’s where Stress Shield comes in. Our solution aims to provide first responders with the care they need to manage stress using personalized AI technology. By tailoring support to each user, we can ensure they receive the focused care necessary to keep them performing at their best. By leveraging this technology, we can assist first responders in managing their stress and navigating the daily challenges of their jobs more effectively.

II. System Requirements Specification

In this section, we will cover our use cases, functional requirements, and non-functional requirements.

II.1. Use Cases



II.2. Functional Requirements

List the functional requirements in this section[2].

II.2.1 User Login and Registration

[User creation]: Allow users to create an account and login to that account so that they can track their progress as they progress with the application. Will allow users to see a personalized feed and health data to ensure that their specific stress needs are met.

- **Source:** This requirement was requested by the development team to provide a way for the application to track user data with their permission.
- **Priority:** Priority Level 0: Essential and required functionality.

II.2.2. Resilience-Building Exercises

[Exercises]: The system must provide guided resilience exercises based on my current stress levels. The system must also change the duration of the exercises according to user progress, ensuring constant improvement.

- **Source:** This requirement was requested by the client to help users manage their stress and learn what proactive steps they can use to prevent further stress.
- **Priority:** Priority Level 0: Essential and required functionality.

II.2.3. User Progress

[Course Tracker]: The system shall provide a clear overview of my progress in the stress resilience course offered on the app.

- **Source:** This requirement was requested from the client to allow users to clearly understand how far they have progressed in the exercises.
- **Priority:** Priority Level 0: Essential and required functionality.

II.2.4. Stress Monitoring and Notification System

[Real-Time Stress Alerts]: The system shall send real-time alerts to the user when their stress levels reach a critical threshold, allowing them to take immediate action to reduce stress.

- **Source:** This requirement was requested from the client to provide timely interventions based on critical stress indicators, as specified by the client's request for real-time monitoring.
- **Priority:** Priority Level 0: Essential and required functionality.

II.2.5. Wearable Watch Device

[Integration]: The app should pair with a wearable watch device to gather real-time data metrics like heart rate, sleep rate, and level of physical exercise.

- **Source:** This requirement was requested from the client to give the user a visualization of their stress journey over time.
- **Priority:** Priority Level 0: Essential and required functionality.

II.3. Non-Functional Requirements

Accessibility

- As a user, I want the app to be usable on various devices (smartphones, tablets, smartwatches) to ensure I can manage stress wherever I am.

Security

- The app will be handling sensitive personal information, including health and stress data. It is imperative that the app remains secure when holding users' personal information.

UI/UX Design

- The app should have an intuitive and engaging interface, similar to Duolingo, so that I can feel motivated to use it everyday.
- The app should offer light and dark mode options for improved accessibility and user preference. Additionally, the app should incorporate visual enhancements to accommodate common disabilities.

Maintainability

- As a user, I want the app to receive timely updates to ensure optimal performance and security.
- As a user, I want the ability to choose when to opt in to system updates, allowing for flexibility in managing changes to the platform.

Reliability

- As a user, I expect the app to operate almost continuously, with only 5 minutes of scheduled downtime per day from 3:30-3:35 AM for maintenance purposes.

Performance

- As a user, I want the system to respond promptly for handling large amounts of data, so that it can ensure good performance for real-time user information.

I/O Device Capability

- App must communicate with a wearable watch device to get system information from it. This information includes sleep data, stress data, and heart data.

Technical constraints

- Ensure the app does not take an excessive amount of resources to run on the native device (i. E. not draining the battery or storage).

Regulatory Constraints

- Ensuring our teaching of health data and handling of health data adheres to health regulations and standards. Also ensuring our data complies with data regulation laws.

Swift IDE

- Using Swift to develop our mobile app and ensuring we have all the proper tools and knowledge to do so.

III. System Evolution

One factor of our design is Software Evolution. During our time working on the project, the application will be given from our client to a small group of frontline workers to test the software from. From the experiences and feedback these people share we will tackle the problems that arise, improve lackluster features, and develop new ways to enhance the user experience. In addition, Precision Edge Performance plans to continue operating the application and seeks to improve it further past the time of graduation. With this process of testing and lengthy plans for future development and maintenance, it's important that our code be modularized and precisely documented to make our code easy to modify, extend, and refactor.

Another factor of our design is the evolution of stress resilience training. Our team understands that stress resilience is an evolving field and that lessons may be changed or added over time. In addition to this, the method that lessons are given in and the gamification of proving learning may also change to increase their effectiveness as research continues. Because of this, the team will especially focus on modularizing our software, so that lessons are easy to modify and can be less interconnected with learning, providing an easy experience when improvements are needed.

Additionally, our team understands that limiting the application to only those within the Apple ecosystem can limit the number of users that the application can reach out to, as according to one study [4] Android holds nearly 72% of the market share in the world. While our team plans to build the first version of the application in Swift, we will ensure that the application will be well documented for future cross-platform development and will also have implementation available for other health monitoring devices that use Bluetooth.

V. References

[1] https://en.wikipedia.org/wiki/Use_case

[2] https://en.wikipedia.org/wiki/Functional_requirement

[3] https://en.wikipedia.org/wiki/Non-functional_requirement

[4] S. Ahmed. (2024, Sep. 23). *Market share of mobile operating systems worldwide from 2009 to 2024, by quarter* [Online]. Available: https://www.statista.com/statistics/272698/global-market-share-held-by-mobile-operating-systems-since-2009/

[5] R. M. Health, “First Responders and Mental Health: How We Can Support our Firefighters, Police Officers, and Emergency Medical Personnel,” *Relief Mental Health*, Feb. 07, 2024. https://reliefmh.com/blog/first-responders-mental-health/#:~:text=%E2%80%9CIt%20is%20estimated%20that%2030