GWC FALL `23

LEADERSHIP ACADEMY

COHORT TEAL FELLOW

GIVE BACK PROJECT

PRODUCT PROPOSAL

CREATED BY:

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PREPARED FOR:

GWC | Hosted by: RTX

girls who code

GET UP!! APPLICATION

ABOUT ME

My name is Tammy Hartline. I am a Senior, studying remotely to obtain my BS in Computer Science with a concentration in Data Analytics at Southern New Hampshire University, (SNHU). I have a 4.0 GPA, am a member of The National Society of Leadership and Success, and work as a student worker through the federal work study program remotely for SNHU, in the Analytics department as a Data Reporting Coordinator. I am passionate about analytics, software development and engineering, and gaining more knowledge related to all fields relevant to technology. When I am not working, or doing school work, I am busy at home, tending to my husband of 19 years, and our three beautiful daughters, Dixie Sue, age 17, Bonnie Blue, age 16, and Mary Lou, age 7.

PRODUCT PROPOSAL & WHY THIS PRODUCT?

My proposal is to develop an application called 'GET UP!!'. I chose this as my Give Back project due to my personal experiences of someone diagnosed with Narcolepsy and Cataplexy. Narcolepsy is a neurological medical condition that causes individuals to fall asleep without warning, even during activities like sitting, walking, talking, and driving. Although Narcolepsy and Cataplexy are not widely recognized, they impact many people globally.

This neurological condition affects the lives of narcoleptics in various ways depending on factors such as age, occupation, home life, symptom severity, and support system. Some individuals cannot work, drive, or even perform basic tasks like cooking a meal on the stove, due to the risk of falling asleep and potential accidents. This is the driving force behind my choice to develop this product.

Unless you live with or personally experience narcolepsy, it's likely that you may not fully comprehend the limitations caused by constant sleepiness or uncontrollable sleep attacks. These limitations have a significant impact on a person's life, particularly their independence and overall quality of life.

What is the GET UP!! Application & Who Will it Benefit?

GET UP!!" will be a mobile application, designed to enhance the lives of individuals with narcolepsy. It will leverage heart rate monitoring capabilities through Bluetooth or other technologies. The app's functionality will involve monitoring and analyzing the user's heart rate to establish a baseline during wakefulness and track heart rate patterns during periods of rest and sleep.

After completing the analysis, the application will establish a personalized heart rate threshold for the user. When this threshold is met or surpassed, the app will activate an alert system. The user will receive an alert message notifying them of the potential risk of a sleep attack. The app will then suggest two options: either to find a place to sit or lie down, or to engage in physical movement by getting up and walking around.

Additionally, the application will feature a timer function. Users will be able to define their preferred bedtime hours. During these hours, the app will enter a sleep mode, refraining from generating alerts to avoid disturbances during normal sleep cycles.

The primary purpose of this application is to provide valuable assistance to individuals living with narcolepsy. By preemptively warning users about the onset of potential sleep attacks, the app aims to empower them to take proactive measures. This kind of support could significantly enhance their quality of life by enabling them to carry out daily activities with reduced risk of accidents stemming from unexpected sleep episodes.

TECHNICAL KNOWLEDGE NEEDED FOR THIS PROJECT

1. **Mobile App Development:** I'll need to be proficient in mobile app development, using the appropriate programming languages and frameworks for iOS and Android platforms.

2. **Bluetooth Integration:** I'll integrate Bluetooth technology to allow the app to sync with the heart rate monitor on the user's smartwatch.

3. **Heart Rate Monitoring:** I'll implement the capability to monitor and analyze the user's heart rate. This data will establish baseline heart rate values during wakefulness and track patterns during rest and sleep.

4. **Alert System:** The app will establish a personalized heart rate threshold based on the user's data analysis. It will then activate an alert system to notify users when their heart rate surpasses the threshold, indicating a potential sleep attack risk.

5. **Timer Functionality:** Users will be able to define their preferred bedtime hours within the app. During these hours, the app will enter sleep mode, refraining from generating alerts to avoid disturbances.

6. **Data Storage and Settings:** User data, including preferred settings and analyzed data, will be stored within the application. This negates the need for an external database.

7. **User-Centered Design:** The app's design will prioritize user-friendliness and accessibility, ensuring that individuals with narcolepsy can easily interact with the application.

8. **Testing and Feedback:** Rigorous testing and user feedback collection will be vital to refine and enhance the application's functionality.

9. **Ethical Considerations:** Throughout development, I'll need to adhere to ethical guidelines and prioritize user data privacy.

Collaboration among developers, designers, and potentially medical professionals is essential to ensure the accuracy and effectiveness of the heart rate analysis and risk detection algorithms. Moreover, considering legal and ethical considerations, like user data privacy and regulatory compliance, is pivotal throughout the development process.

Overview of Steps to Take in Order to Complete the Fully Functioning Application

Define Requirements & Features:

Determine the specific features and functionalities the application will have, such as heart rate monitoring, clock and timer setting functions, alarm triggering, and alerting the user.

Choose A Program Language:

I will likely want to choose a programming language that is commonly used for both Android and iOS platforms. Due to iOS having its own language, Swift, I will likely consider using a cross-platform framework, such as React Native or Flutter.

Set up Development Environment:

Install the necessary development tools and SDKs for the chosen programming language and platform.

Define User Interface (UI):

Create a user-friendly interface that will allow users to connect their heart rate monitoring device, (smart-watch), start monitoring, and receive alerts. Usability and accessibility should also be considered during the design phase.

Monitor Heart Rate:

Continuously read and monitor heart rate data from the connected wearable device.

Alert Mechanism:

When the sleepiness detection logic is triggered, activate an alarm through use of visual, auditory, or haptic feedback to alert the user of a possible sleep attack.

Implement Sleepiness Detection Logic:

Design an algorithm to analyze the user's heart rate data and identify patterns that indicate sleepiness. According to one study, heart rate can be used to determine sleepiness. This could involve setting a threshold for each user based on the analysis algorithm.

Study Citation: Chua, E. C., Tan, W. Q., Yeo, S. C., Lau, P., Lee, I., Mien, I. H., Puvanendran, K., & Gooley, J. J. (2012). Sleepy Driver Study

Overview of Steps to Take in Order to Complete the Fully Functioning Application

Set Time Functionality:	Utilize the users clock on their device, that will allow them to setup normal bedtime hours, so the application will not disturb their normal sleeping patterns with alerts.
Test and Debug:	Conduct comprehensive testing of the application across a range of scenarios, encompassing various daily situations. Verify that the application functions as intended and that all anticipated features operate seamlessly.
User Testing and Feedback:	Conduct user testing to gather feedback on the app's usability and effectiveness. Make necessary improvements based on user input.
Compliance and Legal Considerations:	Ensure the app complies with all relevant privacy and safety regulations. Look into obtaining any necessary permissions for accessing heart rate data and any other access to user data needed.
Launch & Distribution:	Publish the app on the respective app stores, (Apple, Google Play) after all testing and adjustments have been made and completed.
Ongoing Maintenance:	Continuously monitor and update the app to ensure it remains compatible with new devices and operating system updates.