CSR - Comprehensive Stress Relief

CSCI 497H - Principles of Human-Centered Technology Design, Winter 2017

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Abstract - **This document will discuss Team BERG's implementation of how they approached their goal of creating a mobile application to assist in stress relief. By combining common breathing exercises with whimsical games, and utilizing the tools provided within Android Studio, a functional prototype has been created. Extended discussion will cover challenges faced, current limitations, and areas for future improvement.**

I. Introduction

The goal for this project is to create a mobile video game with the intended effect of relieving stress quickly and efficiently after an inducing event. In an ideal situation, the target users would be any persons with access to a smartphone (Android, iOS, or Windows), but within the scope of this classes timeframe, the project will be focusing on the application being developed for the two most recent iterations of the Android mobile operating system. This app will aim to help with the "well-being" of the user. The app will utilize simple visualization and basic breathing techniques to create a relaxing and engaging game experience for the user.

II. Implementation

Our application was designed with Android Studio. The app offers basic functionality consistent with a beginner's knowledge of mobile development. The app includes a variety of activities, each representing a screen for the app. The main screen has working Buttons (and ImageButtons) that can take the user to the settings activity, breathing activity, or bubble popping activity. It also has a changeable background image.   The settings activity has options that can change the internal preference settings of the app. This includes changing the theme or muting the background music that was custom-made for the app. The music incorporates ambient noise and plays at 60 bpm to best relax the user. The breathing activity is built using an assortment of delay functions, image hiding and a countdown timer. It acts as a short graphic to help the user calm down. The bubble popping game is a field of interactive buttons that when "popped", add to the user's score (static int variable). When all the bubbles are popped, they will respawn. This is designed to be simple and easy, to calm and distract the user. The app also has a splash screen that displays the team BERG logo.

From a simplified technical standpoint, the core amount of coding for the project was done in Java, with interface designs written in XML. Each activity mentioned has a driving Java class with an associated XML layout.

III. Evaluation

One method of user evaluation that we hope to use is to implement a quick survey after the user makes use of the app for a bit. Optimally we would like this survey to reach a variety of different users. We would attempt to have at least ten users that identify as male, and ten users that identify as female. Within these samples we would want a variety of different ages as well. The survey itself would be a brief pop-up survey that would ask the user to rate the level of their stress before opening the app, on a scale of 1 to 10. It would also ask how stressed they are after using the app, on a scale of 1 to 10. Assuming we had accounts tied into the app, we could get a sense of how effective our app is at certain locations, time of day, or when certain features are used. This is assuming we have permission to track that kind of data in the first place.

Another method of evaluation we will use would be to observe users using our app and analyze the ease of use of our app. This would

provide us with information regarding how users navigate our app, and help us make sure that our app is easy and straightforward to use. This will help identify anything that could possibly confuse the user and we could make adjustments based on those results.

Within the scope of the current iteration of our application, full evaluation would pose a bit of a challenge since we do not yet have the app in a commercially downloadable format. So these evaluation techniques would most likely be used after implementing some of the feedback received from our poster and class presentations. This will be further discussed in section VI.

IV. Challenges

One challenge was our lack of knowledge of the Android Studio design environment. This unfamiliarity lead to several time-consuming problems. It took hours to get the emulator running on the school computers. Cleaning, and rebuilding with gradle was also completely broken on the school computers leading us to manually delete the needed files by hand, using the file explorer. Related gradle problems led us having to remake the project from scratch multiple times. This involved some copying and pasting of old code and re-typing other parts. There were also minor incompatibility features when using certain android builds. For example, the android sdk 25 has a glitch where it can't use radio buttons correctly. Another challenge was finding time to work together as a group in person. Free-time is a rare luxury in the life of a computer science student, thus many discussions and assignments were done remotely. This was done via mobile phone group texts or google docs.

V. Limitations

Limitations include inexperience with mobile development. Numerous videos and textbooks were read to get a moderate understanding of how to program with android. We decided to not set up a repository for the code, so sharing the most current version of the app with each other depended on meeting with the group in person at the lab. Another limitation

is the time frame of finishing by the end of winter quarter. If this were something like a senior project with a whole school year to work on it, the end product would certainly be better. A final limitation would be our relatively small workforce. One would imagine that a proper app would have a larger team working on it. This would make it much more robust and many more features could be implemented.

VI. Areas of Improvement

Our prototype requires a few improvements before iterations on the product itself can begin. Feedback gathered from the class survey needs to be implemented. This includes adding a user system, where each user can track their statistics related to which games they play the most, which approach to stress relief works the best for them, and how well their stress has been managed over time. Then more game choices would need to be implemented, allowing users to customize their simple, relieving gaming experience. Finally, more choices for themes, both visually and musically, would be added.

Once the changes necessary for a full breadth prototype are complete, we would begin implementing feedback we received from the judges at the poster presentation. First we would update the bubble wrap game to be more relevant to stress relief. We could prototype different approaches here. One way could be to automatically increment the bubble coloring from a dark, angry orange or red to a soft light blue to indicate the release of stress as the game progresses. Another approach could be to include imagery representing real life stressors in the bubbles, and once popped replace them with scenic imagery. Additionally, we would update the constraints of the game or move the actual implementation into a gaming engine where it would create a better visual experience.

Another area we could improve on is user customization. In the current implementation, the only choice of animation for the breathing exercises is a female figure. This could change to a personified animal if the user is not logged in or

did not choose to customize their profile. It could be replace with different race, gender, or age animations based on the user data.

One concern raised by a judge at the poster presentation was that the app could potentially be dangerous to users. The initial concept for the app was to act as a distraction from stressors that are not readily avoidable. This could be potentially dangerous if the stressor is in a violent, active situation. A less dangerous, but still pertinent concern for the user experience is the example of being on a crowded subway train. Being in these loud and mob-like situations is a common stressor. However, if the app was used successfully, the user might miss their stop and cause the stress cycle to restart.

VII. Conclusion

Overall, the initial mission of stress relief is well underway, but in obvious need of further expansion. It is undetermined at this time if any members of the team will be pursuing further iterations of this prototype in the future. That being said, all code has been left public and can be found at gitlab.com/voone/RelaxApp.