

Stress Assessment and Management Mobile Application

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Abstract: In the last few years there has been a major increase in mental health awareness in the society. Stress is included as one of the problems in mental health. Stress is common among students in the university. Stress is not a problem, but it can have a major effect on students or anyone if it is not managed properly. This mobile application is developed to help students to understand the stress that they are having better and possibly develop a method to properly manage their stress. The main feature of this mobile application is it can assess the user level of stress by answering a series of questions. This will help users to understand the stress they are facing. Next, it also able to recommend ways to alleviate or manage stress. After answering the question user will be shown some ways to relieve the stress. This mobile application is hope to improve the quality of life of its user.

Keywords: *Assessment, Stress, Management, Mobile application.*

INTRODUCTION

A simple meaning of stress is the body's response to challenges. The website MedicineNet defined stress is a physical, mental or emotional factor that causes bodily or mental tension [1]. Stress also can initiate the "fight or flight" response, a complex reaction of neurologic and endocrinology systems [2]. The body will produce larger quantities of the chemical cortisol, adrenaline, and noradrenaline during the state of stress. This triggers an increased heart rate, heightened muscle preparedness, sweating, and alertness. All this factor improves the ability to respond to a hazardous or challenging situation. Stress is a natural trigger when facing a certain danger.

Students nowadays are prone to stress because they face a lot of challenges in their daily life. The task as a student, that is studying was not perceived as stressful, but other factors such as parents' expectations, the huge workload on assignment, peer pressure and financial management contribute as factors of stress [3]. Though certain levels of stress push students towards optimum performance, when it is not managed efficiently due to inadequate resources to cope with the stress, it can have dismal consequences for the students as well as the institution [4]. The student who experiences high levels of stress regardless of age, it can interfere with his or

her ability to learn, memorize, and earn good grades. It also can lead to poor physical, emotional and mental health.

There are several serious problems that can occur when a student cannot cope with stress such as depression, anxiety and personality disorders. According to The American Institute of Stress, a constant could lead to several lethal diseases such as heart attacks, stroke, and kidney disease. Stress also could lead to Traditionally students can assess their stress level by answering questionnaires or surveys with their counselors and the counselors will give some recommendations or remedy to cope with the stress. The student also can have a one-on-one session with the counselors. But nowadays, the student does not really have time to have a session with the counselors to assess their stress or to seek for advice when they have a problem. This hindrance has cause students to make poor choices that lead to poor judgment by the student.

In this project, we will be developing an android mobile application that would assess the student stress level at any time and anywhere the student desire. It would assess the stress by using a questionnaire that already proven to be able to assess stress levels. This mobile application also should be able to give a recommendation on how to relieve student stress. This mobile application will help the student to understand

more about stress and how to manage their stress accordingly. When stress is managed properly it will help to improve the learning ability of the student.

LITERATURE REVIEWS

One of the android application that has been created is Breathe2Relax. This application act as a portable stress management tool. This application provides the detailed information on the effects of stress on the body and some instructions to help the user to learn the stress management skills called diaphragmatic breathing. According to this application page, it is said that breathing exercises can decrease stress, and help with mood stabilization, anger control, and anxiety management. The review on this application mainly gives points on its easy layout and its ways of representing how to do the diaphragmatic breathing. The current user does say this application really helps in reducing the stress the user is having. The downside of this application is its security login. The user said that it is cumbersome and not really need as there is no sensitive information required for the application. Some users even said that the security login does not even allow the user to login to the application.

Be Mindful is a website that provides a couple of courses that the user can pay to learn and practice mindfulness. Learning of mindfulness is a claim to be able to help in reducing stress, depression, and anxiety. In this website they have included a "Stress Test", which gives a couple of questions to be answered by the user then it will determine the score or the level of stress the user is having. It is stated in the website it is using Perceived Stress Scale (PSS) in the Stress Test, according to Mind Garden website the PSS is the most widespread psychological instrument for measuring the perception of stress. The main item it assesses is how unpredictable, uncontrollable and overload the respondents find their lives to be. This program is really simple and fast to use, it also shows the result of the stress test in a graphic to make it much pleasant to the user.

In 2018 Bahagian Kaunseling UPM, Universiti Putra Malaysia [4] has created a questionnaire on Google Form for screening purposes of student mental health. This questionnaire uses DASS-42 (Depression, Anxiety and Stress Test) to evaluate the user. According to the Psychology Foundation of Australia, DASS [5] is a self-report instrument designed to measure the three related negative emotional states of depression, anxiety and tension/stress. After the user has completed the questionnaire, the result of the questionnaire will be sent to the email that the user has put in. The result will be in three sections, depression,

anxiety, and stress. It will give a score to all three and show what level of depression, anxiety, and stress the user is facing according to the result of the questionnaire. This google form really gives an in-depth view of one mental health and gives a detail explanation to the user.

Wan Ahmad Jaafar Wan Yahaya and Siti Nor Jannah Ahmad [5] have made a study on developing a multimedia application to increase stress awareness. This application is meant to show its user the danger of stress and how to manage their stress for secondary school student. They use the Perceived Stress Scale (PSS) from Cohen [6] to evaluate the level of stress the student is having.

The objective listed for this study is:

1. To identify the stress stages of secondary school students.
2. To develop a prototype of multimedia software that shows the danger of stress and ways to manage them.
3. To test the effectiveness of using multimedia base technology as an alternative medium to increase the perceived motivation and increase student awareness towards stress problems.

The result that they obtained from this study is that the multimedia application attracted the interest and motivation of the male students compare to female students. They indicated that male students show higher satisfaction value but the female student showing relevance and satisfaction. They concluded that the multimedia application can help the student in increasing awareness and changing the behavior to be much more positive.

The Perceived Stress Scale (PSS) by Sheldon Cohen [8] is one of the most widely used psychological instruments for measuring one perception of stress. It is a measure of the degree to which situations in one's life are appraised as stressful. Items were designed to tap on how unpredictable, uncontrollable, and overload the respondent find their lives. The scale also includes a number of direct queries about current levels of experienced stress. This PSS was designed for use in community samples with at least a junior high school education. The items are easy to understand, and the response alternatives are simple to grasp. Moreover, the questions are of general nature and hence are relatively free of content specific to any subpopulation group. The questions in the PSS ask about feelings and thoughts during the last month. In each case, respondents are asked how often they felt a certain way.

METHODOLOGY

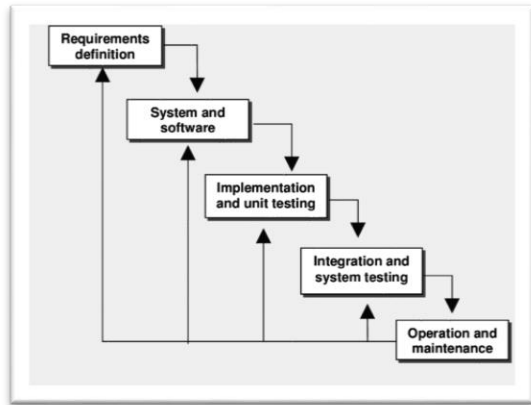


Figure 1: Waterfall Model

The main objective of this project is to develop an Android application that should be able to assess the level of stress from its user and give a recommendation on how the user can manage their stress. This application is developed for mobile because to make it easily accessible to the user at any time and place.

For this project, the waterfall model is selected to be used as its development model. This model is a step-by-step development. For this waterfall model, before continuing to the next phase, testing and quality checking will be done. This is to ensure that application quality and effective development. In this waterfall model, the outcome of one phase is the input for the next phases. There are 5 phases in this waterfall model, requirement definition, system and software design, implementation, integration, and system testing and operation and system testing.

During phase 1, requirements definition, the requirements for the system are listed and the important requirements will be incorporated into the system will be analyzed. The first process in this phase is requirement elicitation and analysis. This process is to derive the requirements of the system through the study and observation of the existing or similar system. After that continued with the requirements specification. This process will lay out all the user and system requirements that will be implemented in the system. The next process is requirement validation. This is to ensure that the derived requirements are suitable and realistic for the system. A set of use cases would be created to describe user interaction with the system. This phase would give deep and clear thought on the final system.

The next phase is the system and software design. The requirements that have been defined from the last phase

will be applied in this phase, which is designing the system. The system design is to specify the hardware and system requirements and helps in defining the overall system architecture. The output of this phase is the structure of the system to be implemented, data models, interfaces between system components, and the algorithms used.

After the system and software design phase are the implementation phase. In this phase, the system that has been designed will be implemented by developing the system in small units of programs or known as modules. These modules will be tested individually also known as Unit Testing. The software to be developed on is Android Studio. Android Studio is chosen because it is the official Integrated Development Environment (IDE) for Android application development. Its stability and function should be enough for the development of this project. The programming language used is Java.

The next process is integration and system testing. For this phase, the units that been developed in the last phase, implementation phase, are integrated into a system after testing each unit. Three main stages during the testing are component testing, system testing, and acceptance testing. Component testing is each component is tested independently, without other system components. Next is system testing, all the components are integrated to create a complete system. This process is to find errors that result from the interaction between components and to test the functional and non-functional requirements. Lastly, the acceptance testing, the complete system will be testing by some users to get critique and finding any error that may arise to further improve the system.

The last phase is operation and maintenance. Once the requirements are fulfilled by the developed systems, it will be deployed to the client environment. Upon operation, some issues will arise. Thus, maintenance must be conducted to fix these issues.

This application will be available on android from android 4.4 KitKat till the last version.

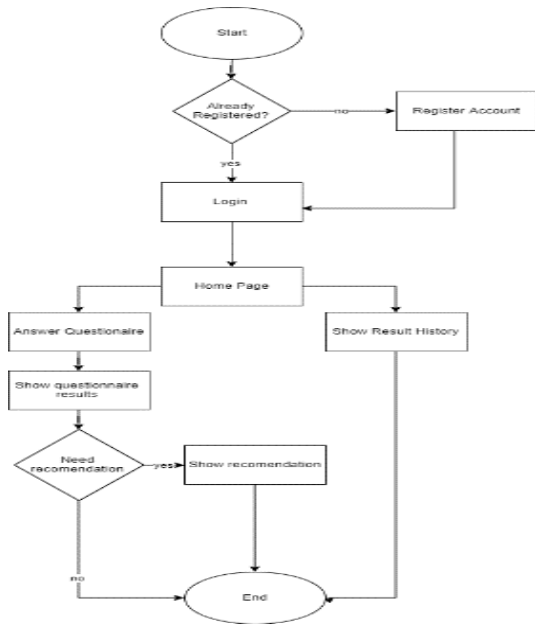


Figure 2: Flow chart

Figure 2 shows the flow chart of the application. When the user first opens the app, they will be greeted with a welcome screen. In the welcome screen, the user will be asked to log in if they have already registered, if not they will be directed to the registration screen. After the user login or register, they will continue to the home page. On the home page there are two choices that the user can choose, that is to do the stress test or see their past result of the stress test. If the user chooses the stress test the user will be directed to answer a set of questions to assess their stress. After finishes, the questionnaire the user will be shown the results and ask whether to get the recommendation or not. Back to the home page, the second choice is to see the past results from the stress test. When they choose this the user will be shown a historical data on the results from their stress test.

RESULTS

The results for this project are a working mobile application that can evaluate the stress level of its user. This mobile application will evaluate the stress level of the survey. This mobile application should also be able to give the recommendation to ease the stress of the user according to the stress level of the user.

CONCLUSIONS

In order for a student to be able to manage their stress, they first need to understand their stress level. This project is hoped to be able to help the student to understand stress better and be able to manage stress.

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