

Development of Mental Health Mobile Application for the Office of Guidance and Counseling

Philip D. Geneta, Rhea C. Coloma, Rubie Anne D. Garcia, John Carlo E. Rosales

Batangas State University
College of Industrial Technology
Marawoy, Lipa City, Batangas, 4217 Philippines
philip.geneta@g.batstate-u.edu.ph, rheacoloma15@gmail.com, grubieanne@gmail.com, johncarloerosales@gmail.com

Abstract: The Mental Health Mobile Application for the Office of Guidance and Counseling was developed to provide an online counseling for the students that will protect their privacy and confidentiality and will address the stigma attach to mental health. This application was designed to utilize the transmission of messages between the students and guidance counselor. Moreover, it also provides useful information about mental health. It also offers online scheduling appointment where the students can request for consultation. Thus, the admin/guidance counselor will use the web-based system to access student's information, provide articles, videos and activities and perform counseling for the students. The researchers used Kotlin for the development of the mobile application, PHP for web development and MySQL for the database. Then the developed application was tested and improved using debugging, compatibility and monkey tests. The performance of the application and web-based system was evaluated by ten (10) experts including guidance counselor, psychometrician and IT programmers, and ten (10) possible end-users including students of BatStateU. It was evaluated using the ISO 9126 model with the following criteria: security, maintainability, functionality, usability and portability. The developed mobile application gained an overall mean score of 4.69 with a descriptive rating of Excellent signifying that the mobile application met its objectives and that the evaluators were satisfied of the outcome and capabilities of the Mental Health Mobile Application for the Office of Guidance and Counseling.

Keywords: mental health, mobile application, information system, Kotlin, PHP, MySQL

Introduction

Human beings perceived the term healthy based on the physical attributes of an individual such as having low cholesterol level, good cardio vascular strength and the absence of diseases but it also covers mental health wherein any problem can also serve as a serious case that can result into some of the worst physical illness. People who have a good mental health can be able to think, feel and act normally or the way it should be. But if a person who has a poor mental health problem may suffer serious difficulty in handling such situation.

According to the report of the World Health Organization (WHO), one in every four individuals can suffer from mental health problems at certain point in their life. In 2015, the global prevalence of common mental illnesses such as depression and anxiety disorders are estimated at 5.5% and 3.6%. While suicide cases have 1.5% of global deaths in same year (WHO, 2017). It was also stated that only half of those affected person received treatment often because of the stigma attached to mental health. Many of those people who have mental health problems are not properly treated because they neither fail to seek it or they are lack of appropriate access. Untreated mental illness can result to higher medical expenses, poorer performance at school or work, fewer employment opportunities and increased risk of suicide [1].

According to Sorel (2010), World Mental Health stated that people at the early age of 14 developed psychiatric disorder. Mental Health problems are best addressed through prevention measures at their early age. Educational institutions, being the student primary environment during their formal educational years, should establish systems, wherein actual and potential mental health problems among the youth can be addressed [2].

As the corona virus pandemic rapidly sweeps across the world it makes it more difficult for people who have mental health problems to cope up with their day to day living

especially the youth. Covid-19 pandemic increased mental health needs among students and youth due to added stressors caused by this pandemic, including the closure of schools, increased financial stress at home and restrictions to freedoms of movement and physical contact.

With the increasing rate of mental health problems among the students and youth different laws were made by the government including Mental Health Act of 2018 Section 25 which states that Educational institutions such as schools, colleges, universities and technical schools shall develop policies and programs for students, educators and employees designed to raise awareness on mental health issues, identify and provide support and services for individual at risk, and facilitate access, including referral mechanisms of individuals with mental health conditions to treatment and psychological support. Therefore, the researchers came up with the idea of creating mental health mobile application that would utilize the transmission of messages between the students and the guidance counselors. This aims to protect the student's privacy and confidentiality and provide them an overview about mental health through videos and articles and will help them cope with mental health problem through provided activities. Moreover, it also let the user request for consultation with an exact time that can be accepted or rescheduled by the guidance counselor.

Moreover, the current situation motivates the researchers to develop an application that is available for smart phones and will give way to access help and guidance and increase understanding of student's mental well-being. Counseling services will be more accessible and possible through this application despite of the current situation. In addition, this includes a web-based system where the admin/guidance counselor can access the information of the students and monitor all the status and activities of the students. This objective can be obtained the use of knowledge and skills developed from their course, Bachelor of Industrial Technology major in Computer Technology. Further, it aims

to help students and guidance counselor in terms of their existing mental health issues.

Objectives

The general objective of the study was to develop the Mental Health Mobile Application for the Office of the Guidance and Counseling. Specifically, the study aimed to:

1. Design the mobile app which is capable of providing online counseling, information services and online scheduling for the students with privacy and confidentiality.
2. Develop the mobile app using Kotlin, PHP for web development and MySQL for the database.
3. Test and improve the developed mobile application and web-based system using debugging, compatibility and monkey tests.
4. Evaluate the performance of the Mental Health Mobile Application using the ISO 9126 Software Quality Model with the following criteria: functionality, reliability, usability, efficiency, maintainability, and portability.

Methodology

The researchers used the developmental type of research to conduct this study. Developmental research involves the systematic study of designing, developing, and evaluating programs, processes, and products [3]. This approach employed thorough planning and analysis to develop the mobile application. The conceptual model, as illustrated in Figure 1, shows the different blocks significant in achieving the objectives of the study.

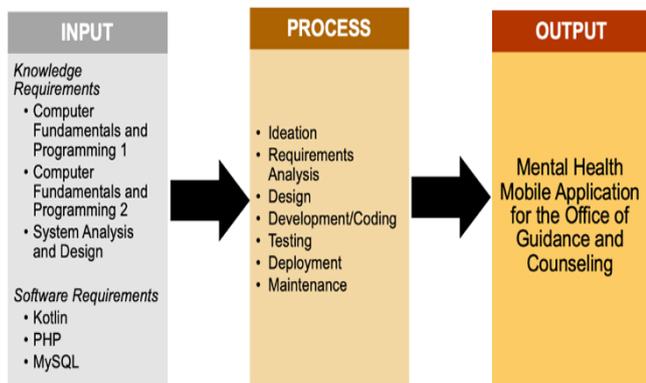


Figure 1. Conceptual Model

Moreover, the researchers also considered the Software Development Life Cycle during the development phase of the mobile application. SDLC provides a systematic framework to design, develop and deliver software applications, from beginning to end. It is a series of steps that offer a foundation for the software development process [4]. Figure 2 shows the Software Development Life Cycle which include the different steps significant in the development process.



Figure 2. Software Development Life Cycle

Ideation. This initial phase is the inception of an idea for a solution that improves an existing solution or develops an entirely new one. Goals and objectives formulation were done through getting suggestions from experts and getting information from different resources and related studies as well as evaluating problems encountered by the Office of Guidance and Counseling about mental health.

Requirements Analysis. In this phase, requirements are gathered to formulate a design plan for the software application solution. The proponents used data flow diagram (DFD) and use case to visualize on how the system should work and function.

Design. This phase focused on the design aspect of the software application solution in terms of the selected technical and functional requirements and the results of the thorough analysis of the software's viability. The design of the system and application shows through the use of different diagrams including ERD and creating user interface design that focuses on its looks and design.

Development/Coding. Coding is the process of transforming the design of a system into a computer language format. This phase of software development is concerned with software translating design specification into the source code. It is necessary to write source code and internal documentation so that conformance of the code to its specification can be easily verified [5].

Testing. This stage included the system performance in the different tests like debugging, compatibility test, and monkey test to make sure that the system works properly. After testing, the bugs as well as the errors on the test results were eliminated.

Deployment. Once the software application is fully developed and tested, it moves to the deployment phase. In this phase, the software is released to the end user for actual use of the product. Thus, the software is fully operational in a live environment where end users utilize it.

Maintenance. This phase is tasked with keeping the software completely operational, updating it to meet quality standards, and enhancing it throughout its life to ensure it works in accordance to its purpose.

Results and Discussions

The Mental Health Mobile Application for the Office of Guidance and Counseling is an application that is capable of giving an online counseling service for the students. The application is intended to utilize the transmission of messages between the students and the guidance counselor and will ensure the privacy and confidentiality of the students at the same time. It also provides useful information about mental health through videos and articles and also offers different activities that will be given by the guidance counselor based on their chosen topic where they want to focus on. Furthermore, the application also makes it easier for the students to request for an online schedule of consultation from the guidance counselor.

In addition, in order to access the information of the students, the guidance counselor will use the web-based system. The web-based system has the schedule tab where they can be able to accept or reschedule the request for consultation of the students. It also contains facts tab that can provide articles and videos to be used by the students, and an activity data tab to give activities that can be done by the students. Moreover, the web-based system allows the guidance counselor to monitor all the user's status and activities. Figure 3 shows the dashboard of the mobile application, while Figure 4 illustrates the dashboard of the web-based system.

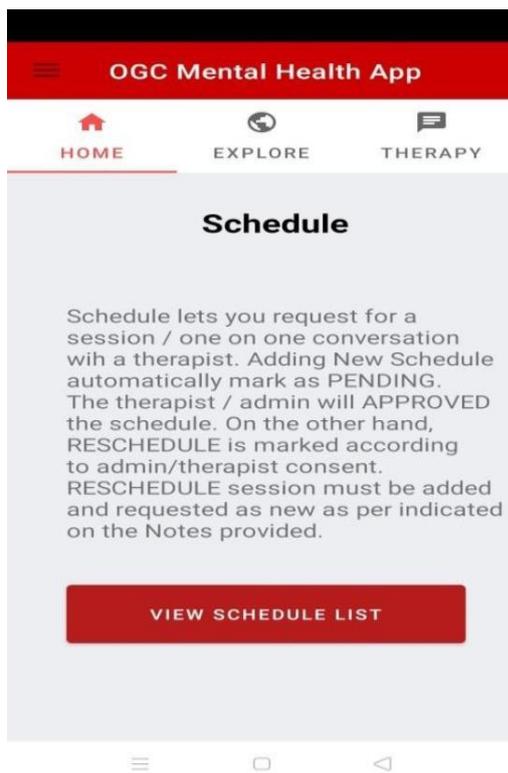


Figure 3. Dashboard of the Mental Health Mobile App

Different programming tools were used to develop the mental health mobile application. Kotlin was used as the programming language, MySQL for the database and Android Studio as the integrated development environment used in developing the application. The Home tab allows the user to add or request schedule for session. Furthermore, the Explore tab contains articles, videos and activities based on the topic selected of the students. While the Therapy button

allows the student to start a conversation with the Guidance Counselor.

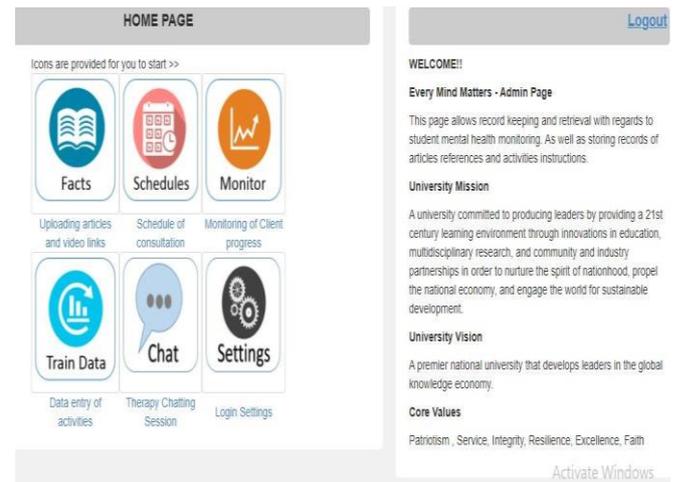


Figure 4. Dashboard the Web-Based System

Figure 4 shows the dashboard of the mental health web-based system. It has buttons for Facts, Schedules, Monitor, Train Data, Chat, and Settings.



Figure 5. Login Form of the Mental Health Mobile App

Figure 5 depicts the login form of the developed mobile app. It has fields to enter the Username and Password, and button for Login and Signup.

Test Results

The developed Mental Health Mobile Application was subjected to debugging, compatibility, and monkey tests. The recorded results were tabulated and/or illustrated, and were supported with explanation.

Debugging Test Results

Table 1 shows sample results of the debugging test conducted. The researchers debugged the system by

identifying a particular problem and isolating its source. After that, it was also resolved the issues found and ensured that the system works properly.

Table 1. Debugging Test Results (Web-Based System)

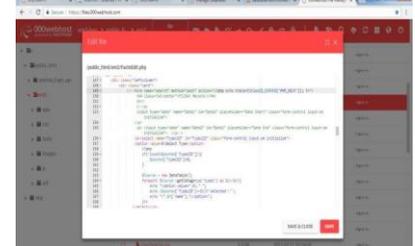
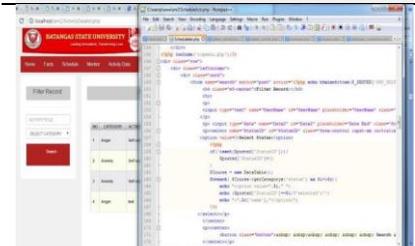
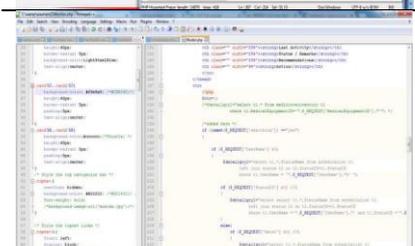
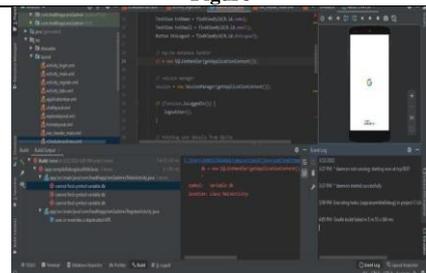
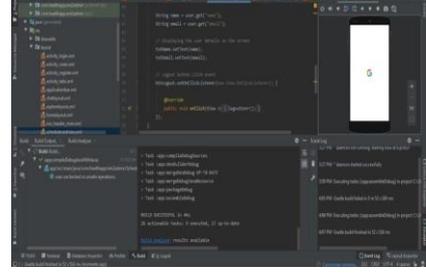
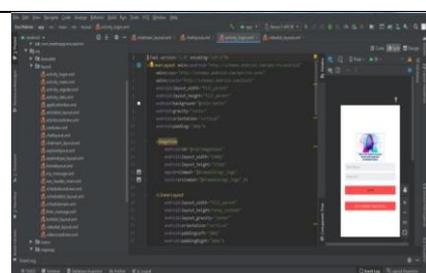
Figure	Description
	Setting up the OGC Admin Page on Online Server Web hosting site. An error occurred stating undefined error for a variable.
	Opening the specific file using a File Editor. Begin to debug the code within the webhosting site and do the adjustment.
	An error on page display looking for undefined index on table forms.
	Fixing the code on specified line.
	If error still occurred, inspect the related file included on the Page.

Table 2 depicts the Debugging Test Results for the Mobile App. The sample screenshots indicated errors and the researchers fixed these errors during the testing phase.

Table 2. Debugging Test Results (Mobile App)

Figure	Description
	OGC App cannot be build and cannot be run due to existing errors. Errors are displayed in red messages.
	Fixing the error, debugging and syncing Gradle are some options to make the app run. Build successful is displayed indicating errors are fixed.
	Successful debugging will display the specific form as indicated according to preference

Compatibility Test Results. The developed mobile app was installed on different Android OS versions such as Android 4.4 Jelly Bean, Android 5.0 KitKat, and higher Android OS. The mobile app worked well on these versions, however, the mobile app was found to be not compatible on IOS during the testing phase. Table 3 shows the results of compatibility test for the mobile app.

Table 3. Compatibility Test Results of the Mobile App on different Mobile OS

Mobile OS	Compatible?		Remarks
	Yes	No	
Android 4.4 Jelly Bean	√		Minimum requirements for the app functions to work, screen is smaller in other devices
Android 5.0 KitKat	√		Screen sizes fit; functionalities are all working
Android higher version	√		All functionalities are working for the mobile app
IOS		√	The mobile app failed to install

Table 4 illustrates the results of compatibility test of the developed mobile app on different browsers such as Google Chrome, Mozilla Firefox and Opera on a Windows 10 operating system. It can be gleaned from the table that the mobile app was capable of running on different browsers, and all functionalities were working.

Table 4. Compatibility Test Results of the Mobile App on different Browsers

Browser	Compatible?		Remarks
	Yes	No	
Google Chrome	√		The admin page automatically fixes in the web browser according to size, no need to install anything.
Mozilla Firefox	√		The admin page automatically fixes in the web browser according to size, no need to install anything.
Opera	√		The admin page automatically fixes in the web browser according to size, no need to install anything.

Monkey Test Results. This test shows a situation where the admin and user entered random inputs at the boxes which require specific information. The system will decline if the entries are not valid. This test was conducted to ensure that the system's stability is accurate in its desired functions. Table 5 shows the Monkey Test Results of the Mobile App, while Table 6 depicts the Monkey Test Results of the Web-Based System.

Table 5. Monkey Test Results (Mobile App)

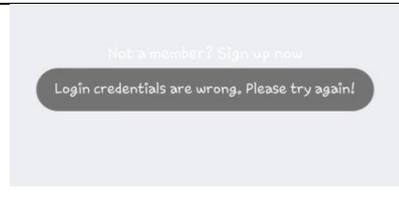
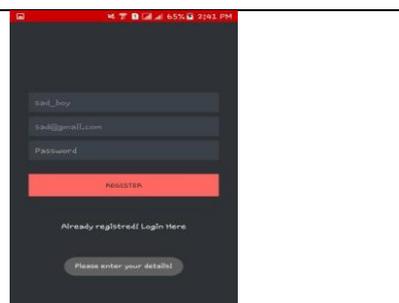
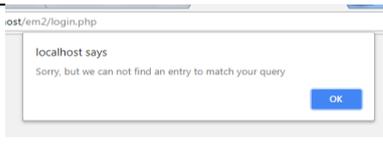
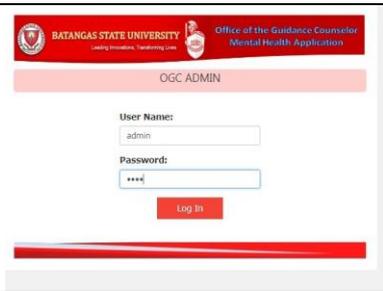
Figure	Description
	Operating the app requires connectivity, an internet connection is needed. A message indicates if there is error while connecting.
	Incorrect login prompts the user to try again due to wrong credentials.
	Registration requires complete details, username, email and password. Incomplete details prompts the user for additional details to register.

Table 6. Monkey Test Results (Web-Based System)

Figure	Description
	Logging in to Admin Page requires username and password.
	Wrong credentials show an error message upon login.
	Keying in the correct credentials is needed for full access to Admin Page.
	Successful login automatically opens the Admin to the Homepage of the web-based system.

Evaluation Results

The Mental Health Mobile Application for the Office of the Guidance and Counseling was evaluated by twenty (20) respondents which composed of ten (10) IT experts, guidance counselor, and psychometrician and ten (10) possible end-users including students. The developed mobile app was evaluated using the ISO 9126 model with the following criteria: security, maintainability, functionality, usability and portability. Table 7 shows the results of the evaluation conducted.

Table 7. Evaluation Results

Criteria	Mean (X)	Descriptive Rating
Security	4.70	Excellent
Maintainability	4.77	Excellent
Functionality	4.62	Excellent
Usability	4.66	Excellent
Portability	4.69	Excellent
Overall Mean	4.69	Excellent

Based on the results, the maintainability of the mobile app obtained the highest mean score of 4.77 with a descriptive rating of Excellent. This implies that the mobile app can adapt easily to a changed environment and responds quickly when failure occurred. However, the functionality of the mobile app acquired the lowest mean score of 4.62. Though

it got the lowest score, still it has the equivalent rating of Excellent because the mobile app is user friendly and can work on its desired purpose.

The overall rating of the developed Mental Health Mobile App for the Office of Guidance and Counseling obtained 4.69 with a descriptive rating of Excellent. This signifies that the evaluators were satisfied of the outcomes and capabilities of the mobile app.

Conclusions

In accordance to the objectives of the study and the results of evaluation conducted, the following conclusions were drawn:

1. The Mental Health Mobile Application for the Office of Guidance and Counseling was successfully designed to provide online counseling, information services and online scheduling for the students with privacy and confidentiality.
2. The mobile app was developed using Kotlin, PHP for web development and MySQL for the database.
3. The developed mobile app was successfully tested and improved using debugging, compatibility, and monkey tests.
4. The mobile app was rated "Excellent" with an overall mean score of 4.69 by experts and possible end users based on the results of evaluation conducted.

References

- [1] World Health Organization (2017). Depression and Other Common Mental Disorders. Retrieved October 20, 2020 from <https://creativecommons.org/licenses/by-ncsa/3.0/igo>
- [2] Sorel, E. (2010). Book review: The WHO world mental health surveys. *American Journal of Psychiatry*, 167 (3), 353-355.
- [3] Richey, R. C. & Klein, J. D. (2005). Developmental Research Methods: Creating Knowledge from Instructional Design and Development Practice. *Journal of Computing in Higher Education*. Vol. 16 (2), 23-38.
- [4] SDLC Methodologies (n.d.). Retrieved April 19, 2021 from <https://svitla.com/blog/sdlc-methodologies>
- [5] Coding (n.d.) Retrieved April 19, 2021 from <https://www.javatpoint.com/software-engineering-coding#>

Author Profile



Philip D. Geneta received his Bachelor of Industrial Technology major in Computer Engineering Technology from Batangas State University and Master of Technology degree from the Technological University of the Philippines Manila in 2006 and 2017 respectively. Currently, he is a full-time faculty member of Batangas State University under the College of Industrial Technology.