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Design and Development of MY DASS; A Mental Health Application for Malaysia Secondary School Students

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Abstract

My Depression Anxiety Stress Scale (DASS), A Mental Health Application for Malaysia Secondary School Students aims to address the challenges of managing numerous manual test results and the inaccuracy of current online tests. The application incorporates the Depression Anxiety Stress Scale (DASS), PHQ-9, and GAD-7 instruments for use among secondary school students. The methodology technique chosen for the development of this project is the Prototype model. MY DASS is developed for two platforms, i.e., mobile and web-based platforms; where the first is meant for school students and parents, while the second is for school counselors and administrators. The implementation of the Android mobile application is done using Android Studio and Firebase while the web application is done using Visual Studio Code and Firebase. Based on the results of the testing phase, the application is effective in solving problems faced by secondary school students, parents, and school counselors.

1. Introduction

Mental health is a condition of mental wellness that helps people manage life's stressors, develop their potential, study, work effectively, and give back to their communities [1]. Mental health problems include psychosocial disorders, mental illnesses, and other mental states associated with significant distress, dysfunction, or risk of self-harm [1]. An adolescent is defined as a person between the ages of 13 and 17. There are nearly 5.5 million adolescents in Malaysia and more than half of them are in school [2].

In the general perception of society, adolescents are usually considered to be the healthiest demographic group because they are energetic and youthful. However, this is not the case and adolescents may be more susceptible to mental health problems because they are going through a period of physical, psychological and social transition and may also experience poverty, abuse or violence [3]. Thus, the Ministry of Education of the Government of Malaysia has issued a circular letter urging schools to pay close attention to students' mental health by incorporating a "Healthy Minds Program" into the 2023/2024 school year calendar. This activity will involve all students in the school. At this stage, many schools offer tests through paper-based methods and require students to complete them but there are some drawbacks to this approach. For example, school counselors' workload has increased, thus neglecting to report on the prediction of the mental health status of some students, parents do not receive reports on the mental health status of their students on time, and students do not take the initiative to ask for help or do not know how to ask for help.

In this project, a mental health application named MY DASS is proposed to allow students to take the Depression Anxiety Stress Scale (DASS) Test, Instrument Patient Health Questionnaire (PHQ-9), and General Anxiety Disorder (GAD-7) provided by the Ministry of Education of the Government of Malaysia. In addition to this, the application suggests ways to reduce anxiety, depression, and stress in students as well as improve self-

confidence. Besides, parents can view their child's mental health reports in the application and find ways to improve their child's care. Next, counselors can access mental health reports for all students through the web-based system. In addition to this, the application provides parents and students with a process for scheduling counseling appointments with the school counselors. The final product of the proposed project will be a mobile application for secondary school students and parents and a web-based system for school counselors and administrators. This is because web-based systems are easier for school counselors and administrators to operate on a day-to-day basis compared to mobile applications.

The paper is organized into 5 sections. The first section is the introduction to the overall of the paper. Next is section 2 which discusses the related work to this project which includes the mental health tests at school and the existing similar application to the proposed application. A comparison of the existing application and the proposed application will start here. After that, section 3 will discuss the methodology and framework of this project. This section will discuss in depth the prototype model including the planning phase, the analysis phase, the design phase, the implementation phase, and the testing phase related to this project. Then, section 4 will discuss the implementation phase and the testing phase for the project. In this section, some of the interface and code segments will be displayed and explained in detail. Then, it will also discuss the result of the functional testing and the user acceptance testing. Last, the paper will end with section 5 which is the conclusion of the overall project that has stated the achievement, limitations, and future work for this proposed application.

2. Related Work

The Malaysian Government is placing increasing attention on the mental health of adolescents, especially secondary school students. In the modern world, reducing mental health problems among adolescents requires the full cooperation of students, parents, and counselors. In this section, existing approaches to mental health testing and counseling in secondary schools will be described. Then, existing systems such as the Mental Health Test, Amaha: Anxiety Self-Care, and THAP: Anxiety Depression Care are reviewed. A comparison is then made between the existing applications and the proposed applications.

2.1 Mental Health Tests at School

In Malaysia, school counselors are required to distribute questionnaires to all grades and monitor their completion. The counselors must then read each questionnaire and calculate their scores and grades to differentiate their mental health levels. If a student has a high grade, the counselor must also make an appointment to meet with the student and provide him or her with counseling. In addition, students and parents can meet with the school counselor to have counseling sessions. However, schools do not provide a complete platform for students and parents to make an appointment with the school counselor. This causes great inconvenience to students, parents, and school counselors.

Currently, students and parents have to visit the school counseling office on their own to check the availability of the counselor and ask the counselor if counseling is available. If the counselor is not available, they will have to make an appointment with the counselor. This wastes valuable time for students, parents, and counselors and may lead to conflicts. On top of that, parents may give up asking about their child's mental state because of the hassle. Fig. 1 shows the process for taking mental health tests at school and getting a counseling session.

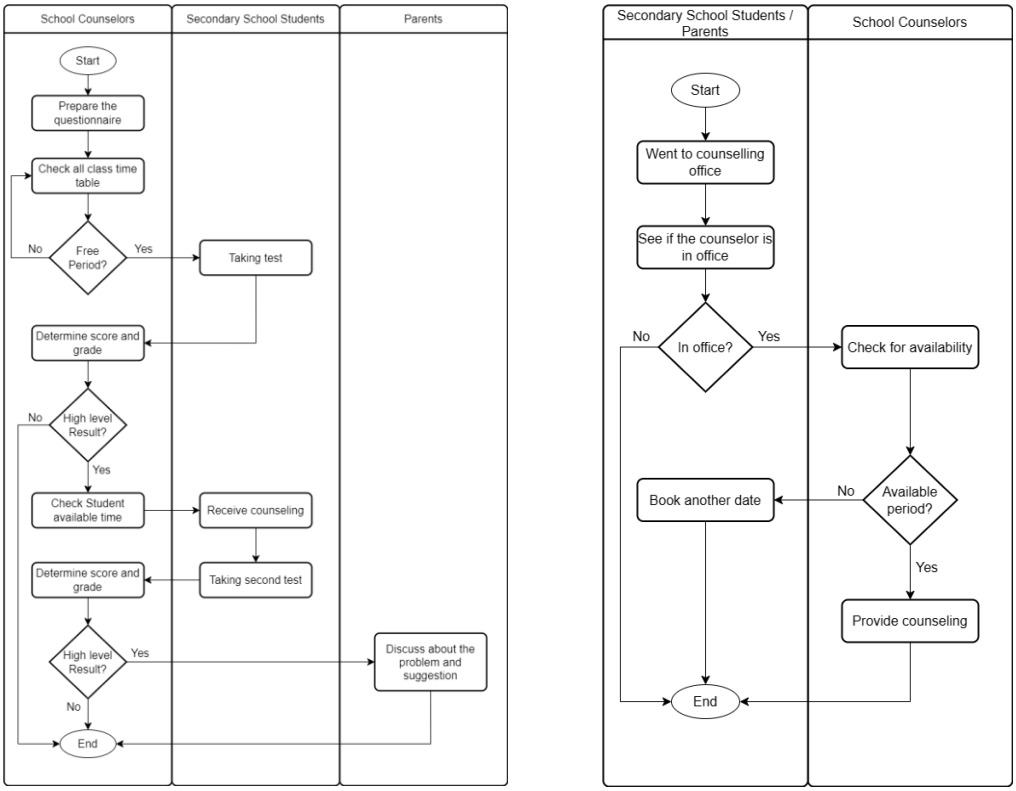


Fig. 1 *Business Program Diagram (a) Taking Mental Health Test at School; (b) Getting Counseling*

2.2 Study of Existing System

It is important to study some similar existing applications because by studying the experiences of others in the same field, developers can better understand their target market and increase the likelihood that their application will be successful. In this section, we discuss three existing applications that have similar features and functions to the proposed application which are the Mental Health Test [4], Amaha: anxiety self-care [5], and THAP: Anxiety Depression Care[6]. Table 1 shows the comparison between three existing applications and the proposed application.

Table 1 *Comparison between three existing applications and the proposed application*

Features/Application	Mental Health Tests	Amaha: anxiety self-care	THAP: Anxiety Depression Care	Proposed Application
Android-based	√	√	√	√
IOS-based	√	√	√	×
Web-based	√	√	√	√
Validation of professional	×	√	√	√
Login/Logout	×	√	√	√
Anxiety, depression, and stress test	√	√	√	√
View the result of the test	√	√	√	√
Reminder and Notification	√	√	√	√
Generate reports	×	×	×	√
Anonymous Chatting	×	×	√	√
Motivational Quotes	×	×	×	√
Writing journal	×	√	√	√

Table 1 *Comparison between three existing applications and the proposed application (cont.)*

Features/Application	Mental Health Tests	Amaha: anxiety self-care	THAP: Anxiety Depression Care	Proposed Application
Information Center	×	√	×	√
Book Appointment	×	√	√	√

Legend: √=yes, ×=no

In general, the existing applications and proposed applications are available in Android-based and Web-based. In addition, the three existing applications are also available in IOS-based however the proposed application is not available in IOS-based. Next, all applications, except the Mental Health Testing mobile application, have professional verification, login and logout features, writing journals, and appointment scheduling features. In addition, all applications feature anxiety, depression, and stress tests, the ability to view test results and get alerts and notifications. Furthermore, the THAP: Anxiety Depression Care and the proposed application have an anonymous chatting feature. The Amaha: anxiety self-care and proposed application have the feature of an information center. However, only the proposed application has the functionality to generate reports and get motivational quotes.

3. Methodology/Framework

The methodology model chosen for this project is the prototype model. The prototype model was chosen for this project because it has several advantages. A highly flexible prototype model for application design allows for quick customization to the demands of the user and results in a user-friendly and simple-to-use system [7]. Besides, the prototyping model allows users to understand the various stages of the system so that it works correctly and meets their needs [8]. Fig. 2 shows the prototyping model with four main phases which are the planning, analysis, design, and implementation. The analysis, design, and implementation phases are executed simultaneously and repeated in a cycle until the system is complete [9].

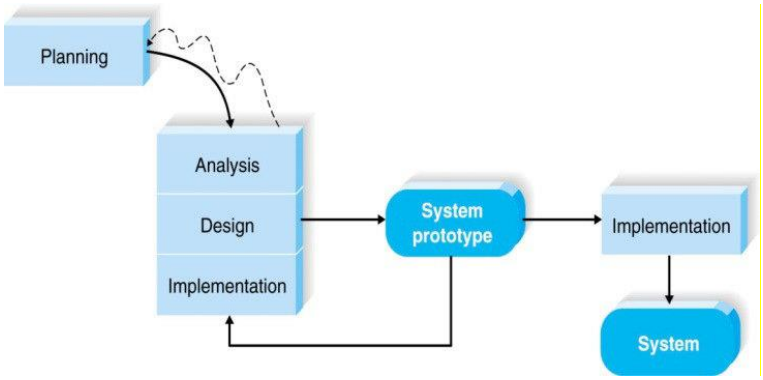


Fig. 2 *Prototype Model [9]*

3.1 Planning Phase

The first phase of the prototype model is the planning phase. This phase is the basis for determining why a software application should be built and how it should be developed [9]. Besides, the objective of this project is to analyze and design a mental health application using the object-oriented approach, to develop a mental health application based on Android technology, and to test and evaluate applications to determine if all functionality is working well and meets all requirements of target users.

3.2 Analysis Phase

The analysis phase focuses on who utilizes the system, what functions it does, and how and when will be used [9]. For this project, we interviewed Ms. Chan Man Yee, the Secondary School Counselor at SMJK Shing Chung, to learn as much as possible about the student's mental health, the Secondary School Counseling Program, and the requirements of the proposed application. This phase also includes a review of existing systems and their problems, followed by recommendations on how to create future systems. After that, Unified Modeling Language (UML) diagrams were also created to provide a visual representation of the project design. The diagrams created involve use-case diagrams, sequence diagrams, activity diagrams, and class diagrams.

Fig. 3 shows the main use case diagram of the proposed application which includes the parent, school counselor, secondary school student, and application administrator. There are 14 main use cases in this use case diagram which are register as parent, register as school counselor, login, book an appointment, notification, anonymous chatting, view information, taking tests, view history, generate report, view motivational quote, write journal, create student's account, and create tests. In this proposed application, parents can register, login and book counseling appointments through the platform and receive notifications about dates and times. They can also access information about school events, apply for programs, and view their children's test history and reports. Next, school counselors are required to go through a registration process, upload certificates for verification, and then manage appointments, respond to anonymous chats, monitor students' test histories, and post motivational quotes.

Besides, secondary students authorized by their school counselor can use the application to get the test, schedule counseling appointments, get test notifications, chat anonymously with their counselor, get information about events, and view test history. In addition, students can engage in daily activities such as reading motivational quotes and journaling. Application administrators play a key role in managing notifications, motivational quotes, student accounts, and school lists, viewing test history, and exercising authority over school counselor accounts, including verification and deletion.

Fig. 3 *Main use case diagram of the proposed application*

3.3 Design Phase

The design phase focuses on how the proposed application will be created to satisfy the user criteria that were specified in the earlier phase. Therefore, the expected features and functions of the system are determined throughout the design phase. In this phase, the design includes interface design and database design. The wireframes provide an outline of the page structure and style, conveying the overall direction and definition of the user interface. In terms of interface design, we begin designing interfaces for secondary students, parents, school counselors, and application administrators. In terms of database design, the proposed application uses the Firebase database. In this phase, it will include the Entity Relationship Diagram (ERD). A graphical depiction

of the relationships between people, things, places, ideas, or events in an Information Technology (IT) system is called an Entity Relationship Diagram (ERD). The ERD diagram will be discussed below.

Fig. 4 shows the Entity Relationship Diagram (ERD) for this proposed application. There are 14 entities in this ERD diagram which include SchoolList, TestQuestion, Journal, Students, Test, Administrator, Information, MotivationQuote, Parent, History, Chatting, SchoolCounselor, Appointment, and Report. In this ERD diagram, there are many relationships between entities. For example, there is a one-to-many relationship between students and journals. This means that one of the students can write many journals however one journal will only belong to one student.

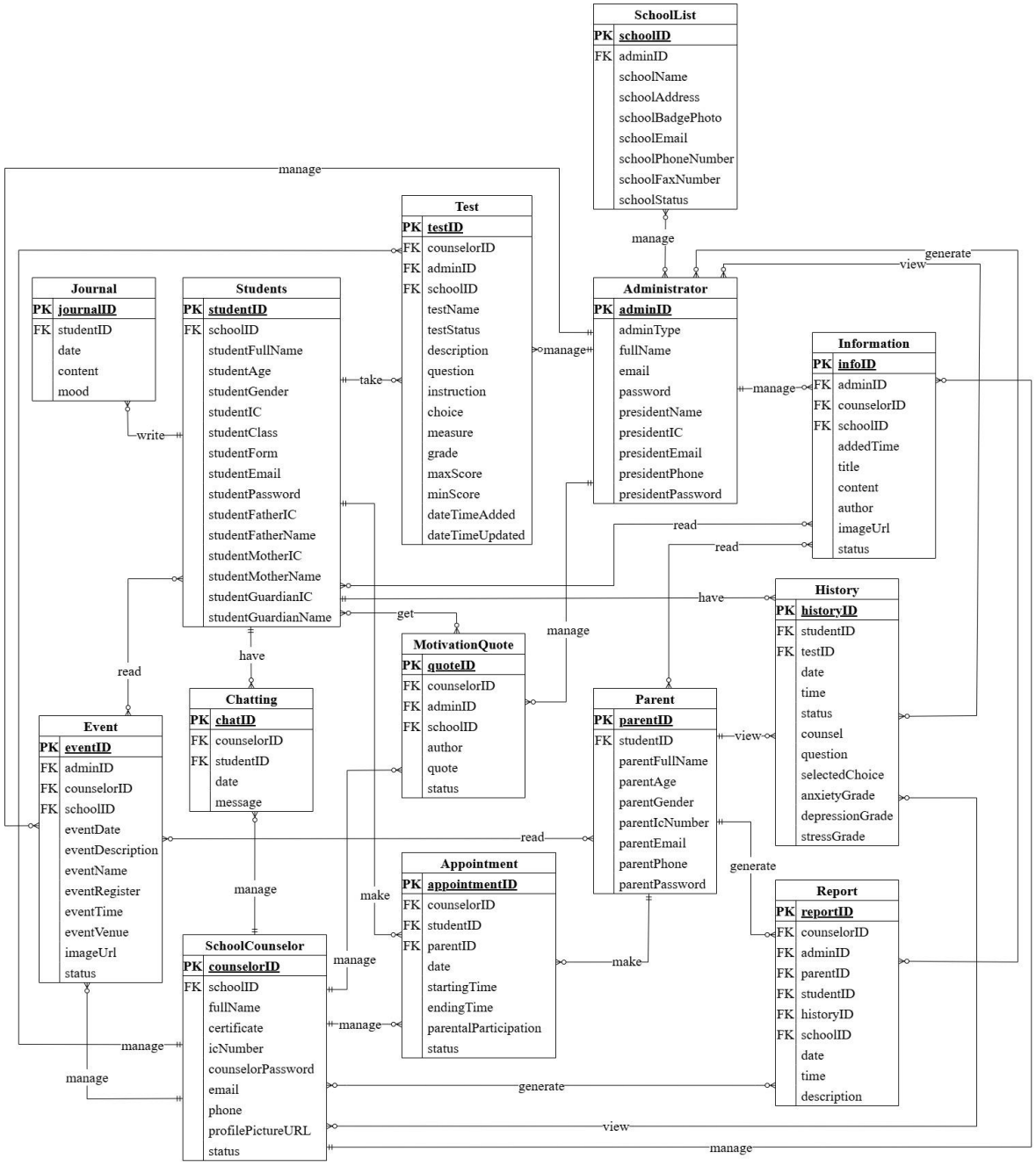


Fig. 4 *Entity Relationship Diagram (ERD) for the proposed application*

3.4 Implementation Phase

The implementation phase begins after the design phase. In addition, MY DASS mobile application was developed using Android Studio which uses the Java programming language. XML and Android Programming are used to design the front-end system. On the other hand, the web-based system for secondary school students

and application administrators was developed by using the Hypertext Markup Language (HTML), Cascading Style Sheets (CSS), and JavaScript as programming languages.

For this proposed application, all modules of the proposed application have been developed to connect to a real-time Firebase database to ensure that user requirements are fulfilled. The Firebase database was chosen because it allowed the proposed system to be built with complete security and recovery procedures in place. In addition, unit testing will be performed for testing the module that has been connected to the database. Furthermore, tests will also be conducted to ensure that all buttons of the application are working properly and can be linked between pages. Next, a simple prototype of the application will be initially developed for users to test and get complete feedback. In this way, the developers will be able to get a clear understanding of the problems and fix them to minimize the errors in the final application. Table 2 shows the software development activities and tasks of the proposed application. This table has summarized all the activities that should be done in each of the phases and there are also the outputs that we may get after we are done with these activities.

Table 2 *Software development activities and task of the proposed application*

Phase	Task	Output
Planning	1. Determine the title of the project which is the Mental Health Application for Secondary School Students in Malaysia. 2. Identify the problem statements, objectives, scope of the project, expected result, and project significance. 3. Set the work plan for the project. 4. Study the online resources and articles about the related title. 5. Study three related existing applications namely Mental Health Tests (Mind Diagnostics, 2017), Amaha: anxiety self-care (Amaha Health, 2017), and THAP: Anxiety Depression Care (The BlacBook, 2022).	1. Project proposal. 2. Gantt chart. 3. Literature Review. 4. Comparison between the proposed application and the related existing applications.
Analysis	1. Interview with the secondary school counselor, Miss Chan. 2. Determine the user requirements. 3. Analyse the hardware and software requirements for the proposed application. 4. Identify the functional and non-functional requirements. 5. Draw and sketch the Unified Modelling Language (UML) diagram for the proposed application.	1. User requirement. 2. Hardware and software requirements. 3. Functional and non-functional requirements. 4. Use case diagram, sequence diagram, activity diagram, and class diagram.
Design	1. Sketch wireframes. 2. Design the user interfaces. 3. Design the database. 4. Presentation of the interface to clients and collection of feedback. 5. Redesign the user interfaces.	1. Wireframes. 2. User interfaces. 3. Database specification. 4. Feedback and comments from clients.
Implementation	1. Developing application modules. 2. Integrate the application. 3. Connect with database. 4. A simple prototype of the proposed application was developed for testing.	1. Mental Health Application for Secondary School Students. 2. Bugs found and fixed.

Table 2 *Software development activities and task of the proposed application (cont.)*

Phase	Task	Output
Testing	1. Perform application testing. 2. User acceptance testing is carried out. 3. Identify areas for improvement.	1. Test cases. 2. Repair the bugs. 3. Release the new version of the application.

3.5 Testing Phase

The testing phase is the final phase in developing this proposed application. Generally, this phase occurs when all the lines of the code are completely developed and implemented. However, for this proposed application, some of the modules are not completely developed. That means that this proposed application is not complete and will continue in the future. Therefore, this phase will not occur at this time and will occur in the future once the proposed application has completely developed. The completed application will be extensively tested and evaluated. In the prototype model, the testing phase is the most important point because it is difficult to deliver reliable software without any testing.

4. Result and Discussion

To ensure that the final product meets its goals, the interface and code segments will be included in this section throughout the implementation phase. Functional and user acceptance testing will be conducted after the implementation phase to find and fix any unforeseen faults.

4.1 Implementation

The implementation of MY DASS uses the Android Studio and Java programming language for the mobile-based application however Hypertext Markup Language (HTML), Cascading Style Sheets (CSS), and JavaScript are used for the web-based system. In addition, Firebase is used to connect mobile-based applications and web-based systems to databases.

4.1.1 User Authentication and Profile Management Module

In MY DASS, all the users including secondary school students, parents, school counselors, and administrators are available to login into the system. By logging into the application, they only need to enter the email address and the password. However, the parents and school counselors may need to verify their email first after login as they have registered their account by themselves. Fig. 5 shows the login page for the school counselor and the administrator. Next, Fig. 6 shows the login process page for the parents and students to login. First of all, they may need to choose the user type and then they will go to the different login page.

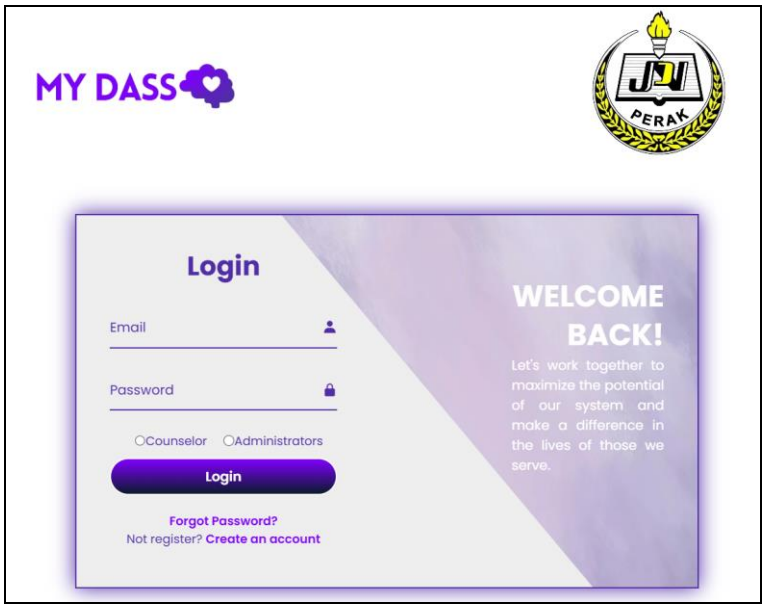
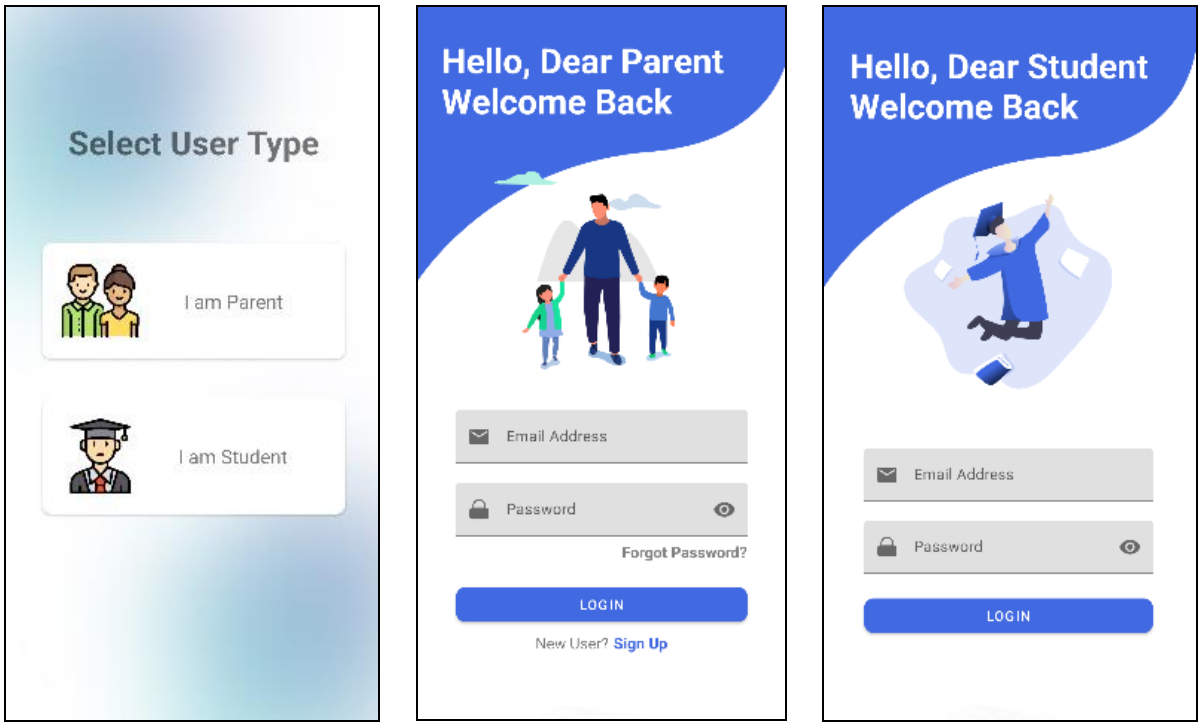


Fig 5 *Login page for school counselor and administrator*



(a) **(b)** **(c)**

Fig. 6 *Login Process (a) Choose User Type; (b) Parents Login Page; (c) Student Login Page*

In addition, MY DASS has some conditions that need to be fulfilled when parents and school counselors register. Fig. 7 shows the code segment for Firebase to check whether the parent's Identification Card (IC) number has been recorded in the student's information. This is because the parent cannot register for this mobile application if the IC number is not recorded in the student's information. Next, Fig. 8 shows the interface that the school counselor needs to update their relevant certificate and the current school's name to let the administrator verify their account. In addition, Fig. 9 shows the code segment that the school counselor will not be able to navigate or access the other features inside the web-based system if the school counselor is not verified.

```
@Override
public void onDataChange(DataSnapshot dataSnapshot) {
    Log.d(TAG, msg: "Checking query, remaining count: " + queryCount.get());
    if (dataSnapshot.exists()) {
        found.set(true);
        Log.d(TAG, msg: "IC number found in current query");
    }
    if (queryCount.decrementAndGet() == 0) {
        if (found.get()) {
            Log.d(TAG, msg: "IC number exists, proceeding with registration");
            registerNewUser(email, password, fullName, icNumber, age, phone, gender);
```

Fig. 7 *Code segment for checking parent's Identification Card (IC) number*

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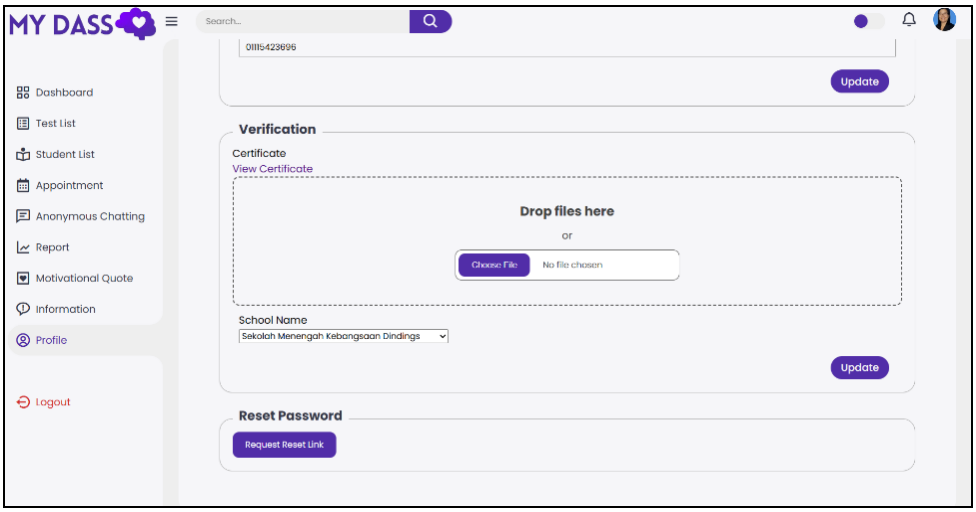


Fig. 8 *Interface for the school counselor to update the certificate and school name*

```
function restrictNavigation() {
    document.querySelectorAll('a').forEach(link => {
        if (!link.href.includes('profile.html')) {
            link.addEventListener('click', function(e) {
                if (link.classList.contains('logout')) {
                    sessionStorage.clear();
                    window.location.href = "../index.html";
                } else {
                    e.preventDefault();
                    alert("You must verify your account before accessing other parts of the application.");
                }
            });
        }
    });
}
```

Fig. 9 *Code Segment for restricting the navigation*

In addition, school counselors can easily manage student information because they can upload Excel files and add a large amount of student information to the system at once. If a student's identity card (IC) number is found in the database, i.e. the student already exists, the system will update the new form and class according to the year, otherwise, the system will automatically create a new account for the new student. Fig. 10 shows the interface of the web-based system that uploads the student information using an Excel file. Fig. 11 shows the code segment for retrieving the student's information from the Excel file.

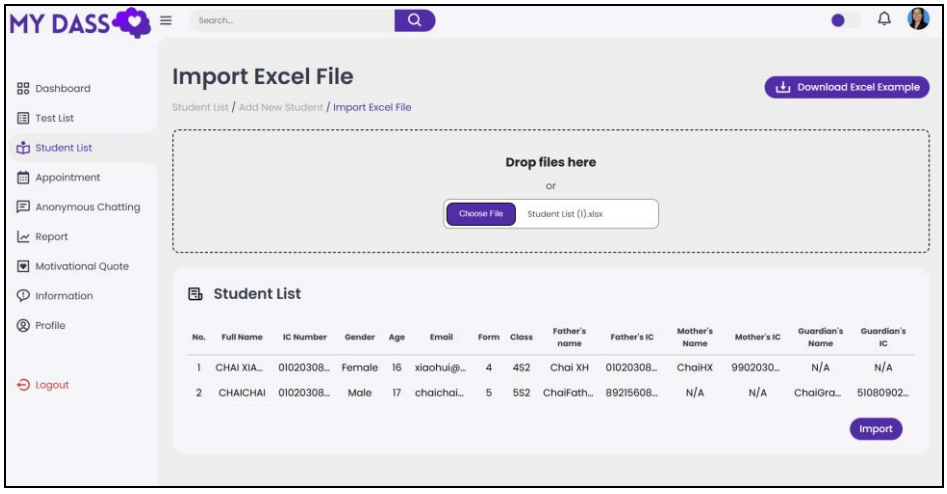


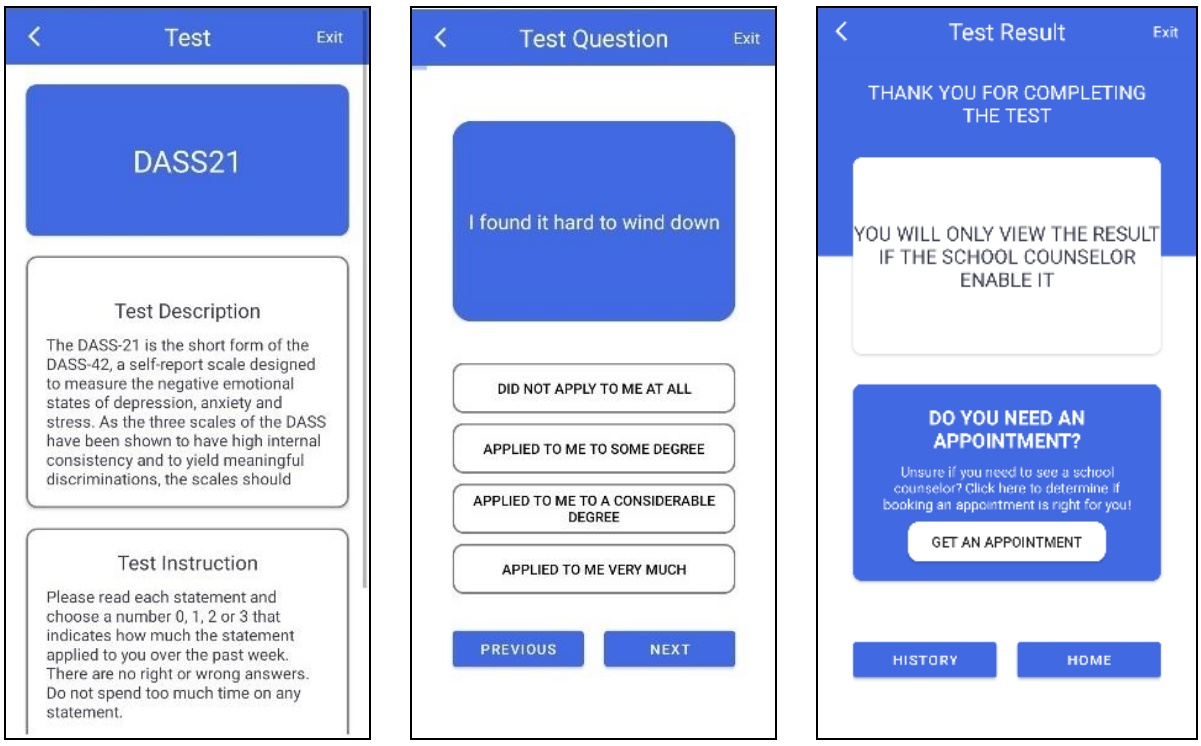
Fig. 10 *Interface for uploading student's Information by using Excel file*

```
function importData() {
    const file = fileInput.files[0];

    const reader = new FileReader();
    reader.onload = function (e) {
        const data = new Uint8Array(e.target.result);
        const workbook = XLSX.read(data, { type: 'array' });
        const sheet = workbook.Sheets[workbook.SheetNames[0]];
        const parsedData = XLSX.utils.sheet_to_json(sheet, { header: 1 });

        // Assuming the timestamp column is the first column and skip it
        const dataWithoutTimestamp = parsedData.map(row => row.slice(1));

        RegisterUser(dataWithoutTimestamp);
    };
    reader.readAsArrayBuffer(file);
}
```

Fig. 11 *Code segment for retrieving the data from the Excel file*

4.1.2 Mental Health Test Module

Next, students can take the tests that have been added by school counselors and administrators. They can select which tests they need to take and it will also have a graph on top to display the number of students taking each test. Once a student clicks on a test, the system displays the test name, description, and instructions. The student can then see the questions and select the option that better fits their needs. The progress of the test is displayed at the top of the page so that students know their progress and if they do not select any answer for the current question, they will not be able to move on to the next question while they can click on the previous question to change their choice for the previous question. At the end of the test, the student is not allowed to know about the test result and they will only see the result after the school counselor has enabled the result for the student to view after they have counseled all the students who have gotten the high grade of the result. Fig. 12 shows the process of taking the test. However, Fig. 13 shows the interface of the dashboard for the school counselor which has the list of the students who need to be counseled and the button to enable all the results for all the students, and Fig. 14 shows the interface of the test history in the mobile application. In the figure, the test history that the school counselor has not enabled will show "Unable to view" while the test history that has been enabled to view will show the result and also the color of the label for each result. The green color represents the result is getting a normal grade however the red color label shows that the test is getting a high grade.



(a) **(b)** **(c)**

Fig. 12 *Taking Test (a) Test name, description, and instruction; (b) Question and choice; (c) End of the test*

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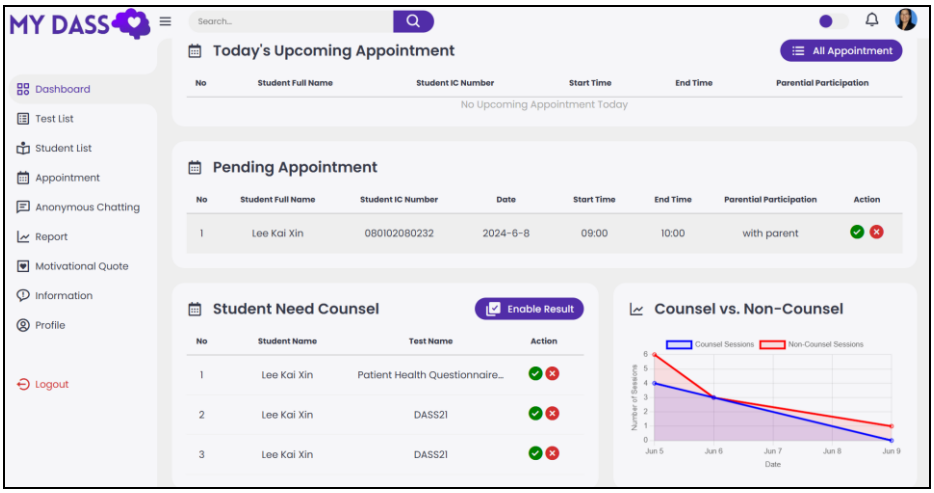


Fig. 13 *Dashboard of school counselor with counsel list and button to enable results*

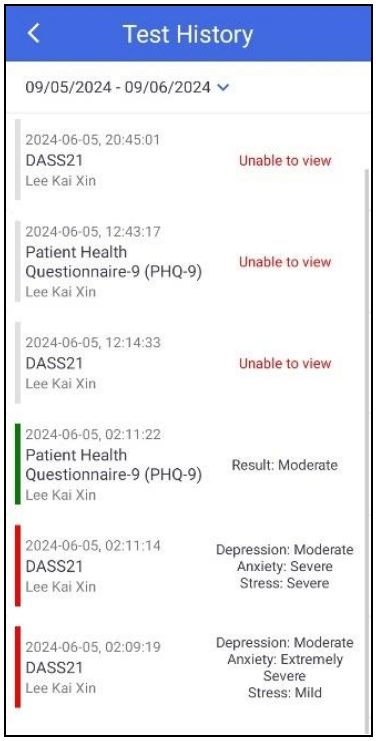


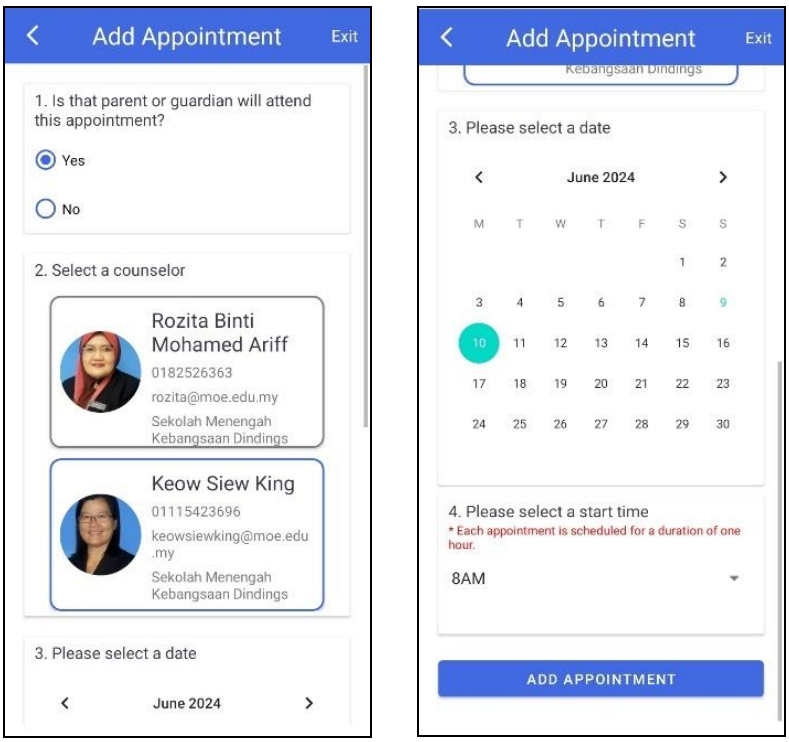
Fig. 14 *Interface of test history in student mobile application*

4.1.3 Communication Module

Furthermore, the students and parents are available to make appointments with the school counselor. There are a few differences between the process of the student and parent to book an appointment with the school counselor. When a student makes an appointment with a school counselor they may need to decide if the parent will attend with them, they will then need to select the school counselor and choose the date of the appointment, the counselor's availability on the specific date will then be displayed. For the process of making an appointment for parents, they need to choose the children who need to have an appointment first. If the child is from a different school, a list of counselors from different schools will be displayed and the parent will need to select which counselor they would like to schedule an appointment with.

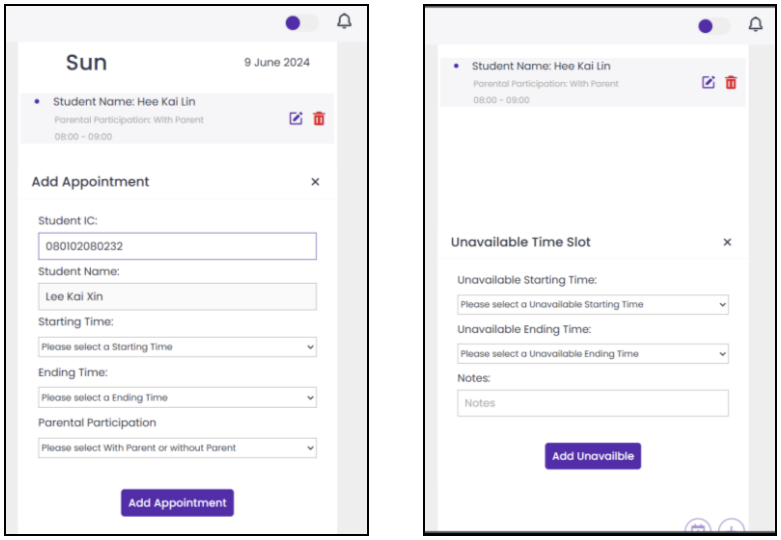
Next, as with the student program, they need to select a date and then the available times for the selected date will be displayed. In addition, they are unable to book a date and time to pass. Next, appointments are one hour in length and may require approval or rejection by the school counselor upon submission. If the school counselor has approved it, it will show up on the upcoming list and will be displayed the same day. Fig. 15 shows

the process of making appointments from the parents' side. Fig. 16 shows the appointment management in the school counselor web-based system. School counselors can add new appointments for students by searching for the identity card (IC) number and also add unavailable time slots. As a result, pre-existing appointment times and unavailable time slots will not be displayed on the appointment page for students and parents, which will reduce the overlap of appointment time slots and allow school counselors to easily manage daily appointments.



(a) **(b)**

Fig. 15 *Parents make an appointment (a) Choose children and school counselor; (b) Choose date and time*



(a) **(b)**

Fig. 16 *School counselor manages appointment (a) Add new appointment; (b) Add unavailable time slot*

4.1.4 Report Module

In addition, school counselors and administrators can view all of a student's test scores for the year. School counselors and administrators can click on the list of students, locate the student's class, and then click on View Results to get all of the selected student's test results for that year. School counselors and administrators can

then generate PDF files of the test results and download the results for future work. Fig. 17 shows the student list with the view result column and Fig. 18 shows the available student test results for the selected year.

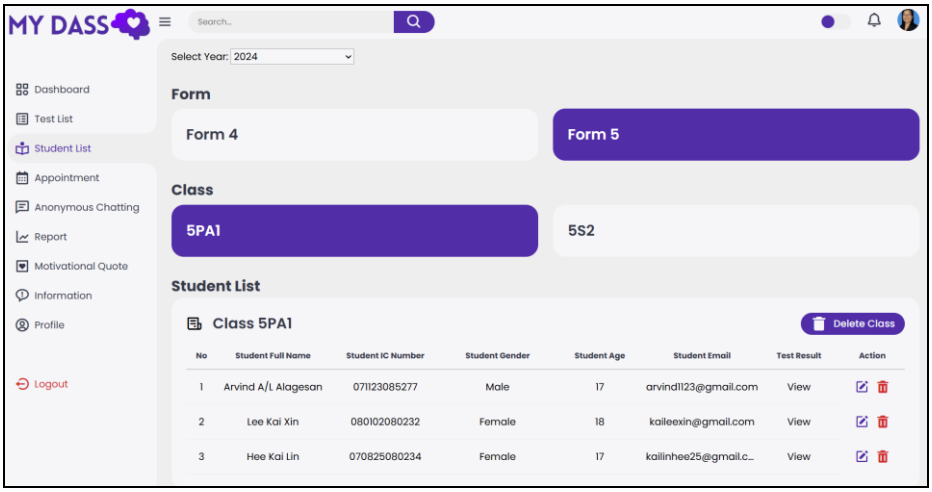


Fig. 17 *Student list with test results for the selected year*

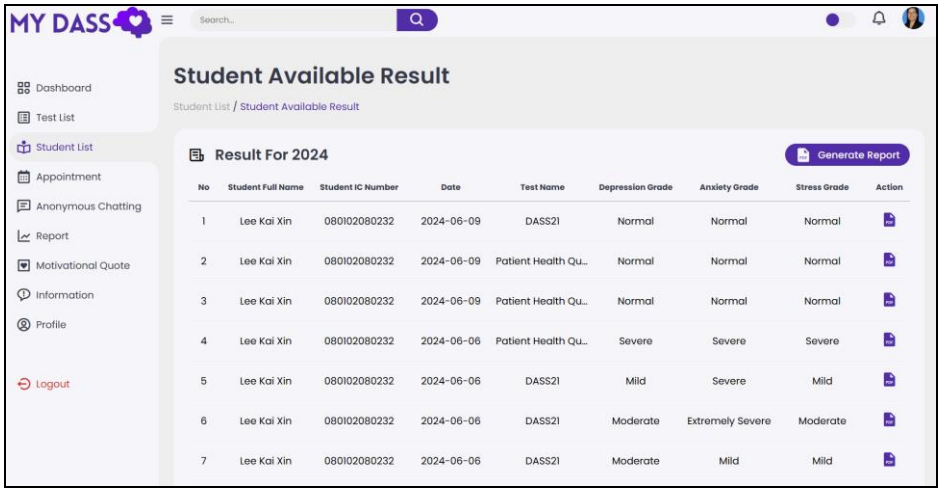


Fig. 18 *Available test results for the selected student*

4.2 Application Testing

In this section, functional testing and user acceptance testing will be carried out to deliver high-quality software that meets both technical and user requirements. Functional testing ensures that the software operates as specified by verifying the user interface, application program interface, database, security, and overall functionality. In contrast, User Acceptance Testing (UAT) is the final testing phase where actual users will validate the software against real-world and predefined acceptance criteria to confirm that the software meets the requirements.

4.2.1 Functional Testing

Table 3 *Outputs of Test Plan Execution on the Proposed Application*

Modules	Functionalities	Actual Output
User Authentication and Profile Management Module - Student - School counselor - Administrator	The parents and school counselors should be able to register a new account by using a valid email and password.	Pass

Table 3 *Outputs of Test Plan Execution on the Proposed Application (Cont.)*

Modules	Functionalities	Actual Output
- Parent	All the users should be able to login with their valid email and password.	Pass
	All the users should be able to logout.	Pass
	All the users except the students should be able to retrieve their password when they forget it.	Pass
	All the users except the students should be able to change their personal information.	Pass
	The school counselor should be able to upload the certificate and school name for verification.	Pass
	The school counselor and administrator should be able to manage the students.	Pass
Mental Health Test Module - Student - School - Administrator	The student should be able to take the test successfully.	Pass
	The student should be able to view the result after the result has been enabled by the school counselor.	Pass
	The school counselor and the administrator should be able to manage the test.	Pass
Mental and Physical Activities Module - Student - School counselor - Administrator - Parent	The student should be able to write the journal every day.	Pass
	The student should be able to view, update and delete the journal.	Pass
	The student should be able to get a random motivational quote when click on the button.	Pass
	The school counselor and administrator should be able to manage the motivational quotes.	Pass
	The student and parent should be able to get the latest information and the details of the event.	Pass
	The student and parent should be able to proceed with registering for the event after clicking the register link.	Pass
	The school counselor and administrator should be able to manage the information and the events.	Pass
Communication Module - Student - School counselor - Parent	The student and parent should be able to check the availability of the school counselor	Pass
	The student and parent should be able to make a counseling appointment through the application.	Pass
	The school counselor should be able to update the unavailability time of appointments.	Pass
	The school counselor should be able to manage the appointment through add new appointment, update appointment, cancel appointment, approve pending appointment and reject pending appointment.	Pass
	The student should be able to send the questions and get the responses from the counselor successfully.	Pass
	All the users should be able to get notifications about the test, appointment, and information.	Pass
Report Module - Student - School counselor - Administrator - Parent	The parents and students should be able to view history for their children or themselves.	Pass
	The school counselor and the administrator should be able to view all the student's test history.	Pass
	The parents should be able to generate the report for their children.	Pass
	The school counselor and application administrator should be able to generate reports based on annual and comparative results.	Pass
Administrator Panel - Administrator	The administrator should be able to view the total number of reports, school, school counselors, parents, and secondary school students.	Pass
	The administrator should be able to manage the school list	Pass

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Table 3 *Outputs of Test Plan Execution on the Proposed Application (Cont.)*

Modules	Functionalities	Actual Output
	The administrator should be able to view all the information of all the school counselors for the school.	Pass
	The administrator should be able to verify the qualifications of the counselor.	Pass

4.2.2 User Acceptance Testing

User Acceptance Testing (UAT), also known as application testing or end-user testing, is a key stage of software development in which the software is evaluated by its intended users before it is officially released. 42 respondents took part in the test which included 30 students, 10 parents, and 2 counselor teachers. Fig. 19 shows the result of user interface evaluation, Fig. 20 shows the result of application features evaluation for students, and Fig. 21 shows the result of application features evaluation for parents. However, the user acceptance testing form for the school counselors is attached in Appendix A.

Fig. 19 below shows that 29 out of 40 respondents were very satisfied with the user interface, including ease of use and understanding, the use of the navigation application of the interface, the design and layout of the interface, and the fonts and font sizes used in the interface. The remaining 11 respondents were satisfied. Next Fig. 20 will relate to only 30 respondents (students). 27 out of 30 respondents were very satisfied with the receive notification feature, 25 out of 30 respondents were very satisfied with the login and logout feature, getting the latest information and details of event feature and anonymous chatting feature, 23 out of 30 respondents were very satisfied with the participate in daily activities and view history for the test results feature, 21 out of 30 respondents were very satisfied with the make quick appointment feature, and 20 out of 30 respondents were very satisfied with the taking test and able to view the result. The rest of the respondents were satisfied. Furthermore, Fig. 21 will relate to only 10 respondents (parents). 10 out of 10 respondents were very satisfied with the register, 8 out of 10 respondents were very satisfied with the login and logout feature and ability to change personal information, 7 out of 10 respondents were very satisfied with the ability to view the history of their children and generate the report for their children, 6 out of 10 respondents were very satisfied with getting the latest information and details of the event, 5 out of 10 respondents were very satisfied with the receiving notification, and 3 out of 10 respondents were very satisfied with the retrieve password and make quick appointment with the school counselor feature. The rest of the respondents were satisfied. User acceptance testing of school counselors which is attached in Appendix A showed that they passed all functions within the web-based system.

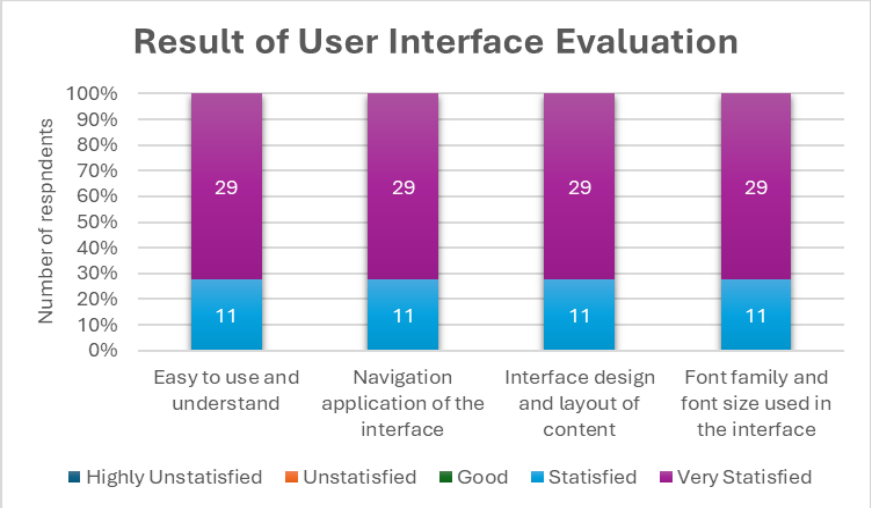

Fig. 19 *Diagram of Result of User Interface Evaluation*

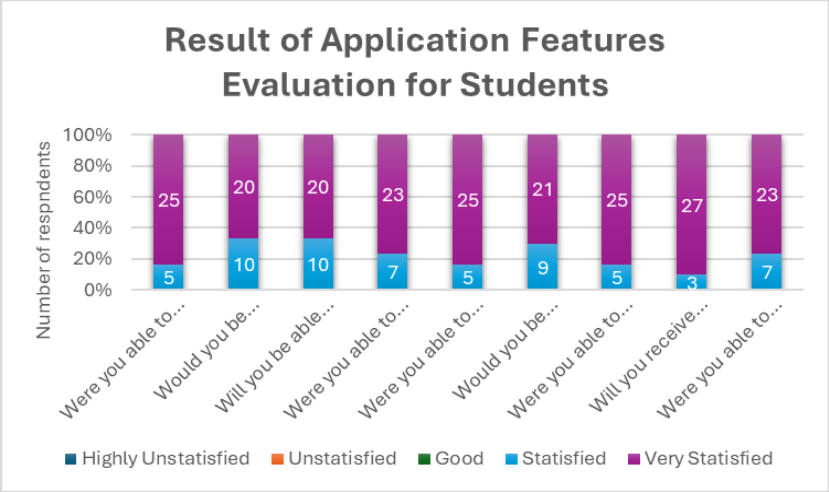

Fig. 20 *Diagram of Result of Application Features Evaluation for Students*

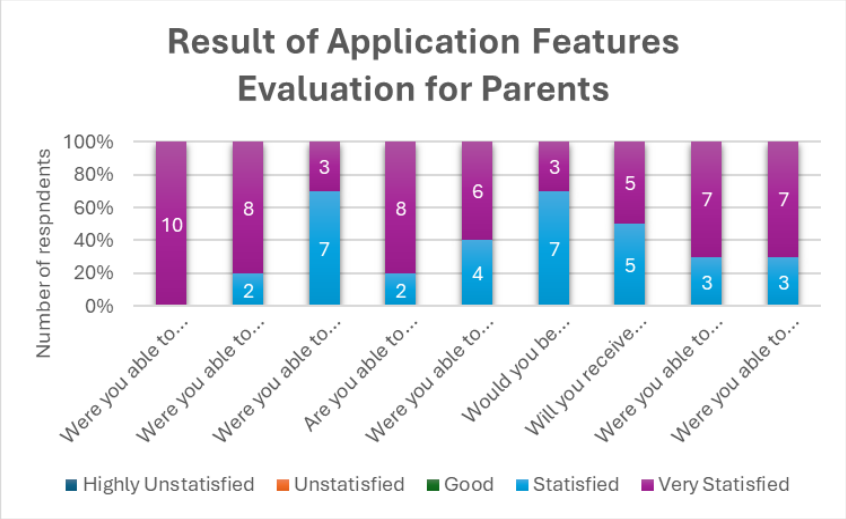

Fig. 21 *Diagram of Result of Application Features Evaluation for Parents*

5. Conclusion

MY DASS has been successfully developed to provide a specific platform for secondary school students to take the test online that is entirely appropriate and accurate for secondary school students and all the test is managed by the school counselor. In addition, MY DASS provides a specific, easy-to-use platform for students and parents to schedule appointments with school counselors. Although most of the functionalities of the proposed application have been successfully developed and achieved their objectives, some limitations remain. The application has the limitation that it only has one language which is English. The second limitation is that parents who have made an appointment cannot cancel it on their own and need to contact the school counselor to cancel the appointment or change the date or time. The third limitation for school counselors and administrators is that they are the only ones who use the web-based system, which may result in them not being able to use the system anytime, anywhere because he does not have a mobile application.

Therefore, some improvements can be made to the application to make it better and more user-friendly in the future. The first improvement is the application should be able be multilingual and allow users to choose their preferred language as this would make it easier for them to use the application. Second, future applications should allow parents and secondary school students to change or cancel appointments after they have been submitted to avoid submission errors or the need to change schedules due to unforeseen issues. Third, applications for use by school counselors and administrators can be significantly enhanced or redeveloped through the use of cross-platform frameworks.

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Author Contribution

This journal requires that all authors take public responsibility for the content of the work submitted for review. The contributions of all authors must be described in the following manner:

The authors confirm contribution to the paper as follows: ***study conception and design:*** *Chai Xiao Hui, Norfaradilla Wahid;* ***data collection:*** *Chai Xiao Hui, Norfaradilla Wahid;* ***analysis and interpretation of results:*** *Chai Xiao Hui, Norfaradilla Wahid;* ***draft manuscript preparation:*** *Chai Xiao Hui, Norfaradilla Wahid. All authors reviewed the results and approved the final version of the manuscript.*

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Appendix A: User Acceptance Testing

User Acceptance Testing (UAT)
MyDass: Mental Health Application for Secondary School Students

Name: CHAN MUN YEE
School Name: SMJK SHING CHUNG
Position: SCHOOL COUNSELOR

Acceptance Criteria	Test Result		Remark
	Pass	Fail	
User Authentication and Profile Management			
a) Able to register an account	✓		
b) Able to login into the account by entering a valid email and password.	✓		
c) Able to change personal information	✓		
d) Able to upload validation information	✓		
e) Able to add new students	✓		
f) Able to display students	✓		
g) Able to update students' information	✓		
h) Able to delete students	✓		
Mental Health Test			
a) Able to add new Tests	✓		
b) Able to display Tests	✓		
c) Able to update Tests	✓		
d) Able to delete Tests	✓		
Mental and Physical Activities			
a) Able to add a new motivational quote	✓		
b) Able to display motivational quote	✓		
c) Able to update the motivational quote	✓		
d) Able to delete motivational quote	✓		
e) Able to add new information and event	✓		
f) Able to display information and event	✓		
g) Able to update information and event	✓		
h) Able to display information and event	✓		
Communication			
a) Able to add new appointments for student	✓		
b) Able to display appointments	✓		
c) Able to update appointments	✓		
d) Able to cancel appointments	✓		
e) Able to add unavailable time slot	✓		
f) Able to delete unavailable time slot	✓		
g) Able to approve or reject appointments	✓		
h) Able to get a chat with students	✓		
i) Able to get notification	✓		
Report			
a) Able to view students' test result	✓		
b) Able to generate the report	✓		

I, CHAN MUN YEE .....hereby declare that the information provided is true and correct.

Tested by,

CIK CHAN MUN YEE
Guru Bimbingan Dan Kaunseling
SMJK Shing Chung, Jalan Besar
31100 Sungai Siput (U), Perak

Name: CHAN MUN YEE
Date: 10/6/24

Fig.A.1 *User acceptance testing for school counselor*