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# A Personality Career Test for Public Secondary Schools Using Android Application

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**Abstract**: Personality test is a tool used to assess human personality which there are two types of personality tests that is self-report inventories and projective tests where most schools use self-report inventories by paper which is inefficient and require resources more than what can be achieved by using mobile android application instead. Existing applications of personality test in Google Play are not using the same inventory tests that are used within public schools which makes it not viable as a primary source for public schools. This project is about developing an android mobile application that helps user to determine their personality and narrow down some of the suggested types of career that suits the user's personality. At the end of the test, the application will calculate the user scores and present 3 keywords that represents user personality instantly which saves time and resources required compared using paper-based method that public schools use. The methodology used to develop this project is Multimedia Content Development (MMCD) methodology to narrow down system requirements and user requirements that is suitable for mobile learning application. Testing phase is carried out amongst target user which is secondary school students and the subject matter expert of this project by using google form for testers to leave their review of their experience on using the application. The testing results for this project gained positive feedback from the testers with the score of 81.38% in System Usability Scale (SUS) score.

**Keywords**: Mobile application, Android, Personality Test

## 1. Introduction

A person can be very complex when it comes to understanding their true nature. Each person can have different type of personality. People are thinking about their future and questioning their future career whether it is a career for them or is it not. Nowadays, corporate organizations are looking for more dedicated workers that have an exceptional personality rather than a plain study record. Developments in personality psychology over the past 20 years suggest that people can be characterized in terms of their traits and that can be taken advantage of this in ways that gives positive impact for employee development and organizational positive effectiveness [1].

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Schools especially secondary schools are the place where students have to decide on which field of study they are going to pursue. With the age of technology, the paper-based process of taking the psychometric test is one of the elements that can be improved among schools. Therefore, the idea of creating a mobile game application that can serve the same purpose as the psychometric test but having the benefits of mobility, accessibility and availability will help students to identify their future career anywhere and anytime.

Public secondary schools are currently using paper-based psychometric test to determine student's personality test results. This causes multiple disadvantages and drawbacks for counsellors and students. By switching to handheld mobile personality test application, schools can gain multiple benefits as well as lowering the cost of making personality tests. Using paper requires distribution face to face to each student and it is difficult especially during the pandemic of Covid-19. One of the benefits of using mobile platform is it is accessible anywhere and anytime for students and teachers to conduct this test. During the pandemic, all processes of learning are in long distances, thus using mobile which are easy to use and portable is best during these times. Psychometric tests in schools does not give results instantly after taking the test. Students would have to calculate their score and then listen to what their score results define their personalities from counsellors. This process takes time and resources from students and teachers. By using "Career Personality Test" application, results are instantly generated without having to calculate the score manually. The results would also give guides on each different personality and which career suits that personality.

In order to achieve the aim above, few objectives have been set as following. To design a mobile personality test application using gamification approach. To develop a mobile personality test application on Android platform. To perform alpha and beta testing of the application.

The application is based on "Inventori Minat Kerjaya 2" questions that school uses as psychometric test to determine students Holland Code using Holland Method of 6 categories keyword "RIASEC" stands for Realistic, Investigative, Artistic, Social, Enterprise and Conventional. The personality test has score to determine user results. At the end of the test, the system will display user results based on their score. The results vary for each student based on their input answers at each question. The result displays 3 highest score of Holland code from RIASEC. This application will be focused on user between the age of 16 to 18 years old. This is during their upper secondary in secondary school. During this age, they are already intelligent and mature enough to think about their future career. The personality tests will serve as a guide or recommendation to their study path. The project must be able to run on all Android devices from Android 4.0 until the latest version.

This paper will be divided into 5 main sections. The first section is the introduction, second is related work, third is methodology, fourth is result and discussion and lastly the fifth section is the conclusion. Each section will explain the project details and its steps during the development of this project.

## 2. Related Work

Related works are important when researching a particular topic. In this section, two sub-section will showcase some examples that are related to our project which is developing a Personality Career Test Mobile Application.

### 2.1 Related Technology

There are multiples related technology the project use during the development of this project. Mobile Learning is one of the terms that can relate to this project. Mobile Learning has been a powerful tool for learning during this pandemic. Mobile learning potential in education industry has been growing as its benefits are suitable especially in long learning distances. Nowadays, most people have their own devices to connect to the Internet. Mobile phones are one of the easiest methods to access to the Internet

anywhere and anytime. This shows the benefits of developing in Mobile Learning is truly an opportunity for the education industry. Mobile learning is e-learning through mobile computational devices: Palms, Windows CE machines, even your digital cell phone [2].

### 2.2 Existing Applications

In this section, the project will compare three existing similar application that can be used to make a comparative analysis. The table below features highlights from each application and a short list of pros and cons is created to compare the advantage and disadvantage for each application.

**Table 1: Similar existing application comparison**

| Application | 16 Types Personality Test | Personality Trait test | Aptitude test Personality test games |
|---|---|---|---|
| Language | Cesky, English, Portugues | English | English |
| Features | • Using Myers-Briggs Type indicator method<br>• Ads included<br>• Free with full feature<br>• Detailed results | • Using Myers-Briggs Type Indicator<br>• Results shows 4 code and shows iconic person that has similar personality as user<br>• Ads included<br>• Full version locked | • Using Holland Code RIASEC<br>• Have 4 different types of test (IQ, Personality, Career, other)<br>• Premium app to unlock full feature<br>• Ads included |
| Pros | • Free to use all feature available<br>• Detailed description of results<br>• Multiple language | • Creative design<br>• Short summary of results | • Multiple number of tests and activities |
| Cons | • Contains ads | • Paid to unlock full version | • Free version requires 24 hours wait time before results are generated |

## 3. Methodology

Methodology is a system of ways of doing, teaching, or studying something [3]. The purpose of having a methodology is to help progressing the project's development direction towards an end product successfully and making a schedule to divide tasks accordingly. In this project, the project use Multimedia Content Development (MMCD) as the methodology for developing the application.

### 3.1 Multimedia Content Development (MMCD) Methodology

The benefit of using MMCD methodology is because it is for developing an effective m-Learning application that highlights on user needs. MMCD is based on the characteristic of an agile development model which is widely used by today's mobile devices [4]. Multimedia Content Development (MMCD)

is a methodology that has five main components which is application idea creation stage structure analysis stage process design stage main function development stages testing stage

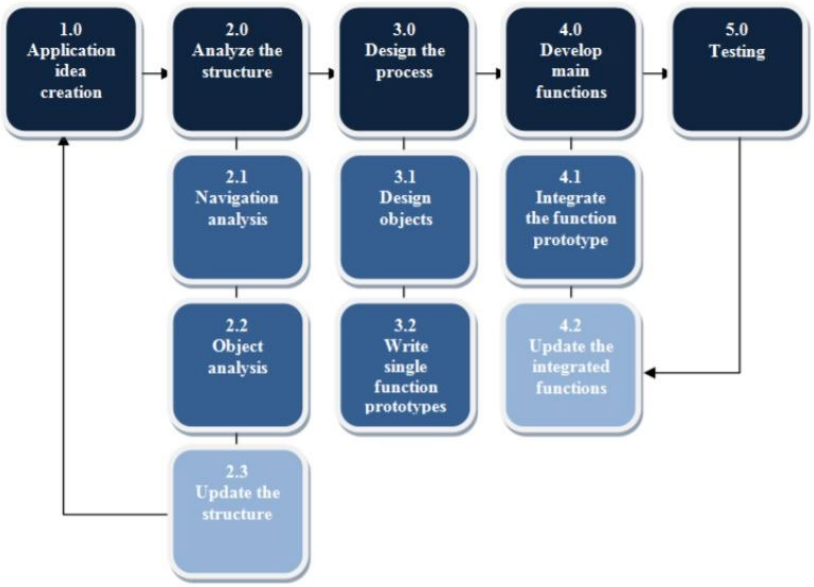



**Figure 1: MMCD methodology phase**

## 3.2 Application Idea Creation Phase

During this phase, a check list table was created as shown in Table 2. This information purpose is to prepare vital information needed before designing and developing the application.

**Table 2: Application idea creation check list**

| Item | Note |
|---|---|
| Type of application | Quiz Test Mobile Game |
| Target Device | Android 4.0 and above |
| Target Users | Secondary school students (age 13-18) |
| Application Settings | • Scripting Backend: IL2CPP<br>• API level: .NET standard 2.0<br>• FPS: 24<br>• Resolution: 1080x2160 pixels (Portrait mode) |
| GUI | • Splash Screen, Main Menu, Tutorial, About, Gameplay, Result |
| Images | • Play Button<br>• Card Artwork (56 total)<br>• Result icon token (18 total) |
| Video | • None |
| Audio | • In-game background music<br>• Swipe SFX<br>• Victory SFX |

**Table 2: (continued)**

| Item | Note |
|---|---|
| Application Synopsis | Career Personality Test is a free mobile application where user can determine their type of personality using Holland Code Test which shows three of user highest Holland Code based on user interest in different areas. This test is based on module that are currently use in public secondary schools in Malaysia. Find out user's Holland code and see which type of career suits the user. |

3.3 Structure Analysis Phase

During this phase, analyzation of the overall structure of the application by categorise it into two tables which is navigation of the application and the objects used. Content structure table as seen below was produced during the analysing of the application based on application idea creation.

**Table 3: Navigation content structure list**

| Item | Note |
|---|---|
| Layers Design | Layer 3: Event system<br>Layer 2: Content<br>Layer 1: Background |
| Frame Design | Frame 1: Splash Screen<br>Frame 2: Main Menu<br>Frame 3: Tutorial<br>Frame 4: Gameplay<br>Frame 5: Results<br>Frame 6: About |
| Menu and Navigation | Navigation<br>- Button Right (Navigate to next page)<br>- Home Button (Navigate to main menu)<br><br>Main Menu<br>- Play Button<br>- Title<br>- About |

**Table 4: Objects content application**

| Item | Note |
|---|---|
| Number of main GUI | - Splash Icon<br>- Play Button<br>- RIASEC icon (6 Total)<br>- Card Artwork (56 Total)<br>- Highest Holland Code Result (3 Total)<br>- Result Continuation (9 Total) |
| Sub GUI | - Holland Code Result (3 Total)<br>- Result Continuation (9 Total) |

**Table 4: (continued)**

| Item | Note |
|---|---|
| Images | • Play Button<br>• Card Artwork (56 total)<br>• Result icon token (18 total)<br>• RIASEC Model |
| Placing audio | • In-game background music<br>• Swipe SFX<br>• Victory SFX |
| Placing Video | • None |
| Animation | • Card swiping<br>• Result Screen |
| Action-Script Draft | • GetInputMouseButton()<br>• OnClick() |

When developing an application, user analysis requirement is essential to bring the scope of the project. An interview was carried out with a subject matter expert counsellor from SMK Permas Jaya and a research of target user preferences UI was carried out using articles and examples of existing application.

From the interview, functional requirements and non-functional requirements are analyzed to develop the application. Functional requirements purpose is to capture the intended behavior of the system while non-functional requirements describe constraints on the system such as cost, weight or other performance requirements [5]. This behavior may be expressed as services, tasks or functions the system is required to perform.

**Table 5: Functional requirements analysis**

| System | Function |
|---|---|
| User Interface Input | • The system should be able to recognize user input touchscreen<br>• The system should be able to navigate through the application when user presses the next button |
| Test Question | • The system should be able to track user swiping card direction<br>• The system should be able to load next questions after user answering one |
| Score | • The system should be able to calculate the 3 highest score user |
| Result | • The system should display the 3 highest score based on user's score<br>• The system will display the Holland code with the corresponding highest score obtained from user<br>• The system should display the explanation of the Holland code obtained in results screen when user press the next button in result screen. |

**Table 6: Non-functional requirements analysis**

| System | Function |
|---|---|
| Usability | • The application navigation structure is easy to understand and use.<br>• The application test questions should take around 5 minutes to complete<br>• The system uses English language that are simple to understand |
| Reliability | • The application should be able to operate smoothly without crashes or error output |
| Performance | • The system load time must be not more than 5 seconds in between loading scene<br>• The test results of the system generate instantly after taking the test |
| Availability | • The system should be able to operate at any time once user has successfully installed the application<br>• The application will be able to operate without requiring internet connection once installed. |

### 3.4 Process Design and Develop Main Functions Phase

The aim of this phase is to create all items listed in Table 3 and Table 4. During this phase, the project focusses on completing each frame ascendingly according to the list of frame design in Table 3. In this project, process design phase was combined with develop main functions phase into one since the project made changes frequently after reviewing it with my supervisor. This saves time to avoid prolonging the progress demonstration of the prototype.

The design of the application such as buttons or images was created using Adobe Illustrator. Adobe Illustrator is a software application for creating drawings, illustrations, and artwork using a Windows or MacOS computer.

The script inside Unity was developed using C# language inside visual studio code. Script handles basic functions of the application for example keeping the input of user when user answering the test questions. Controls scene management by user interaction with navigation buttons.

After obtaining the requirements of the application, the project's application design is discussed which involve the flowchart of the application, the interface design and navigation structure.

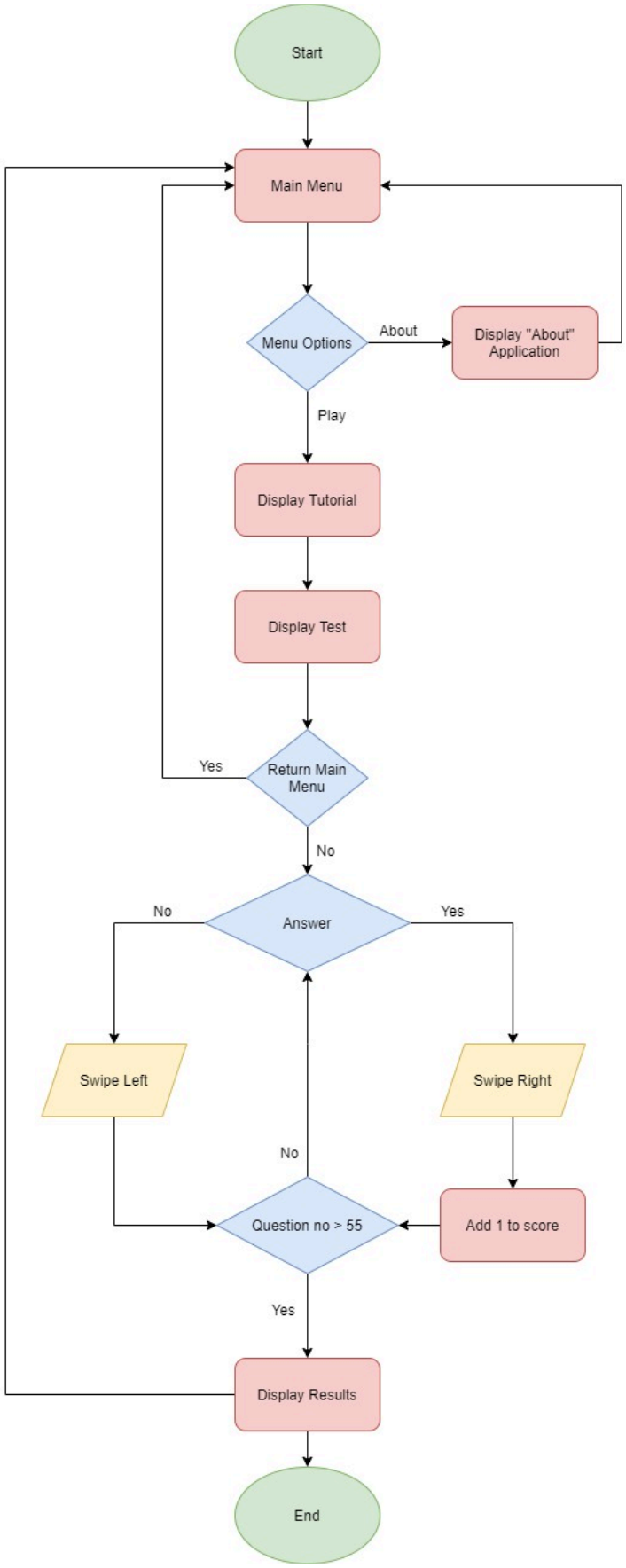



**Figure 2: Flowchart of application**

**Table 7: Interface design**

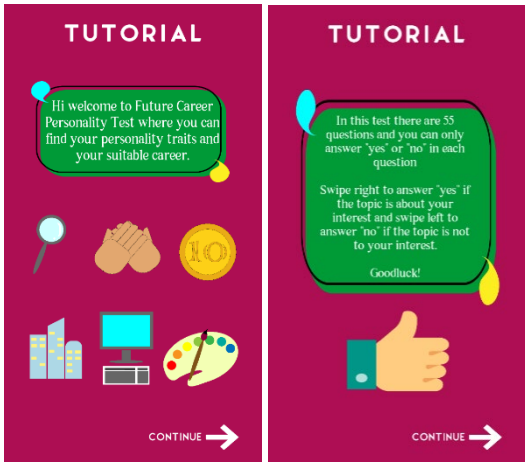
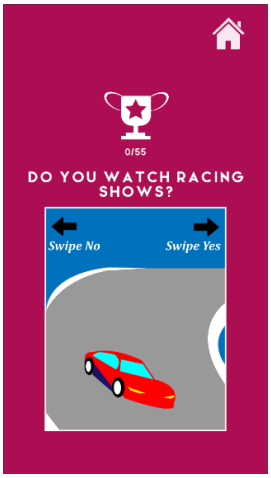
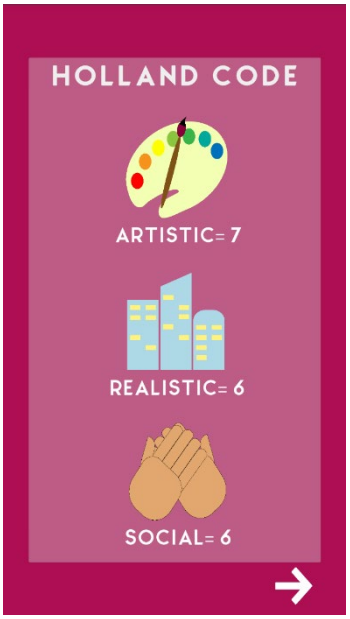
| Interface Design | Note |
|---|---|
|  | In the main menu, user can start to take the test or check the application about section. Once user click play button, it will navigate to tutorial scene. |
|  | In this page, the application will explain the Personality Career Test contents and instructions to answer the test. Once user clicked continue, the system will navigate user to the personality career test. |
|  | User will see a card with a question dialogue and answer dialogue. The choice of answer has only 2 which is yes or no. The user will have to slide right to answer "yes" and right for "no". Once the user has answered, the card will generate a new question for user to answer until 55 questions has answered. User can go back to main menu by clicking the home icon. Underneath the trophy icon is the indicator that shows the user's progress answering the test. |

**Table 7: (continued)**

| Interface Design | Note |
|---|---|
|  | Once user has completed all personality test questions. The system will display score result which adds up all answers from user and shows result based on the user answers. User will get their Holland Code which shows three letters of the highest total answer. The first letter is their highest and second and third is their runner up. |

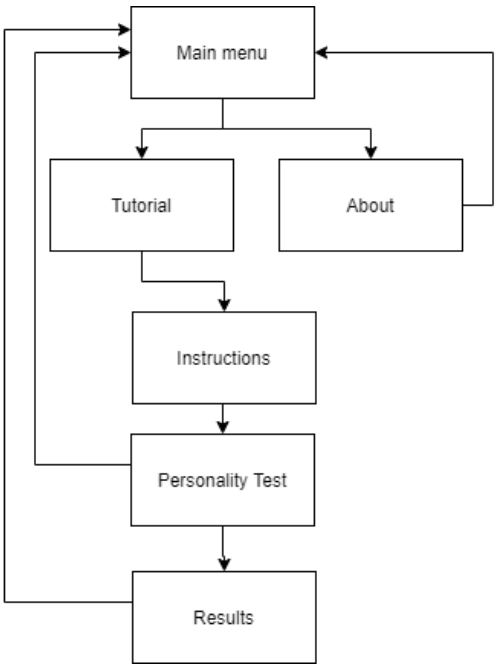



**Figure 3: Navigation structure**

## 3.5 Testing Phase

In this phase, the application is already built and exported into an APK file. Details regarding the application name and its release is already determined. The project was shared using google drive to target users and SME. A form was provided for testers to leave out their review of the application performance. This concludes the methodology of MMCD where testing phase is the final phase of this methodology.

## 4. Results and Discussion

A Google form was created in order to gather data from a total of 9 testers. The testers are from close relations such as family and friends and to the SME of this project. Target user from the age of 13-18 is included in this testing results. The results are as the following figures below:

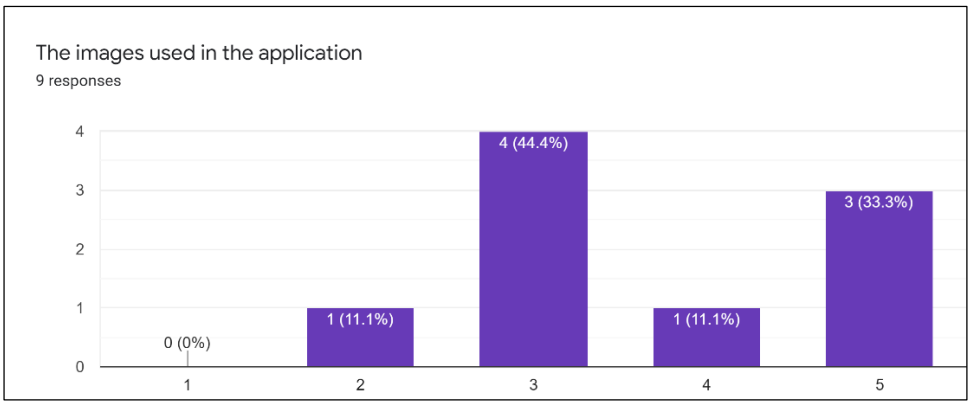



**Figure 4: Images feedback**

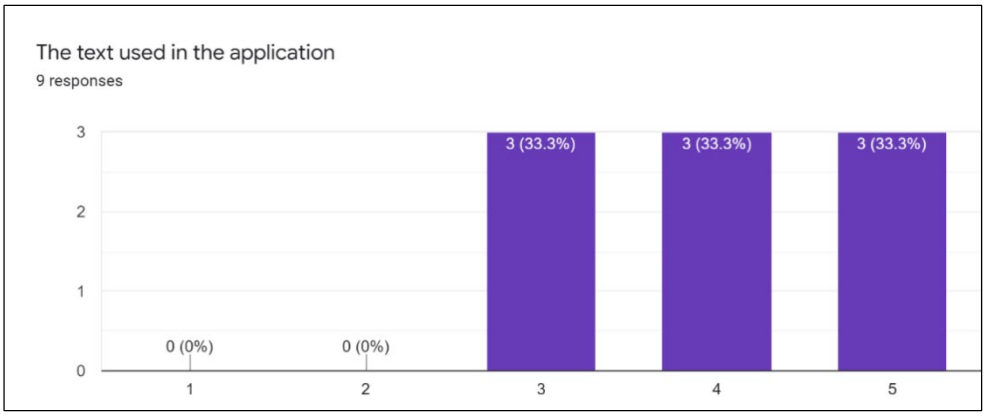



**Figure 5: Text feedback**

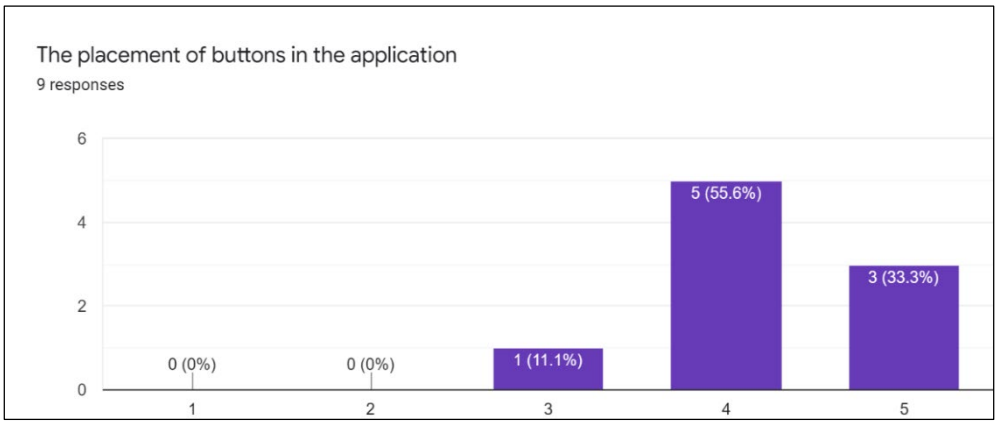



**Figure 5: Button feedback**

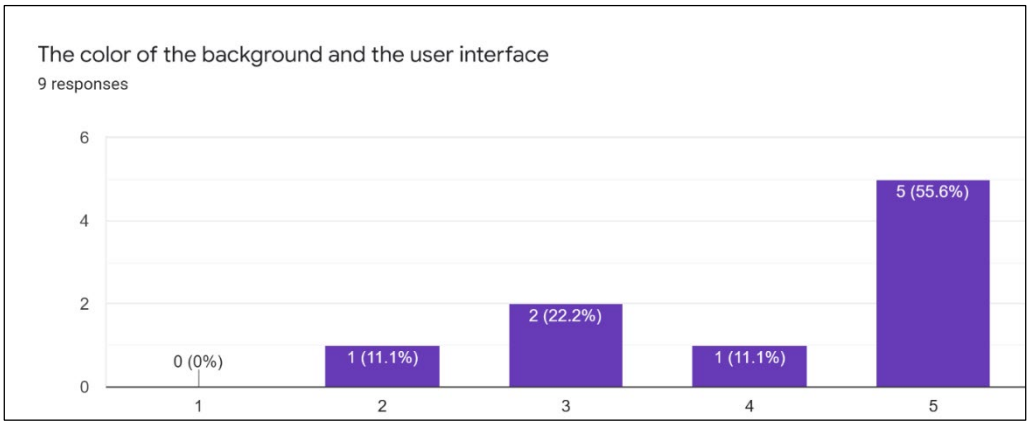



**Figure 6: Color interface feedback**

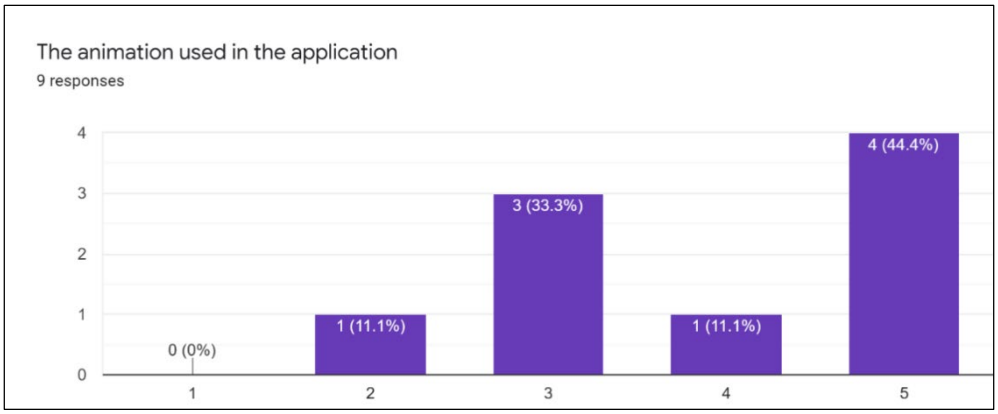



**Figure 7: Animation feedback**

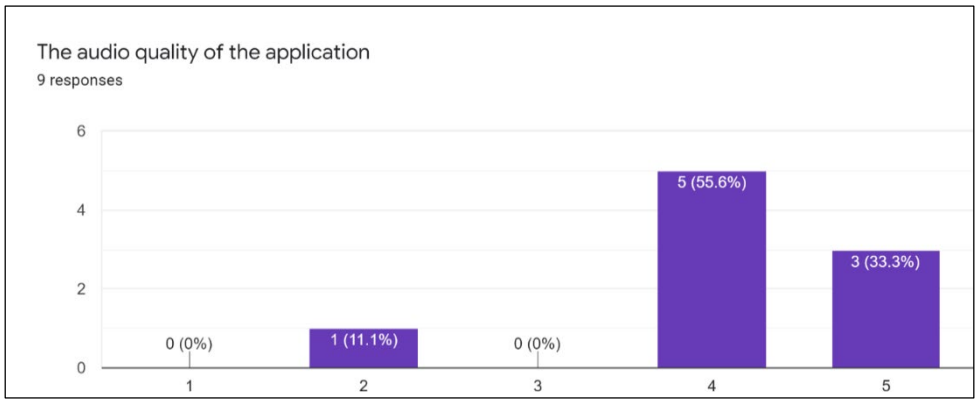



**Figure 8: Audio feedback**

Based on the feedback gained from the user regarding the interface of the application, the majority agrees to the design of the application and is satisfied with the project application.

After testing out on different users, the application has some issues regarding the screen resolution. Some devices cannot load the full screen and are focused on a small area of the application. This can be the cause of some users that cannot press the button properly and have issues when using the swiping mechanisms.

To see this application usability level, a formula is used to calculate the results using System Usability Scale (SUS). The SUS, developed by Brooke (1996), reflected a strong need in the usability

community for a tool that could quickly and easily collect a user's subjective rating of a product's usability [6]. The formula below shows the calculation used to calculate SUS score.

$$Y = P/Q * 100\%$$

Where,

Y = Score Percentage

P = Total respondent score

Q = Total maximum score

Thus,

$$Y= 271/333 * 100\% = 81.38\%$$

Based on the formula SUS calculated as above, the percentage of usability of the application is 81.38%. On a scale of SUS, this is considered to be good and acceptable. This proves that the application is eligible for production and can be used on multiple Android devices

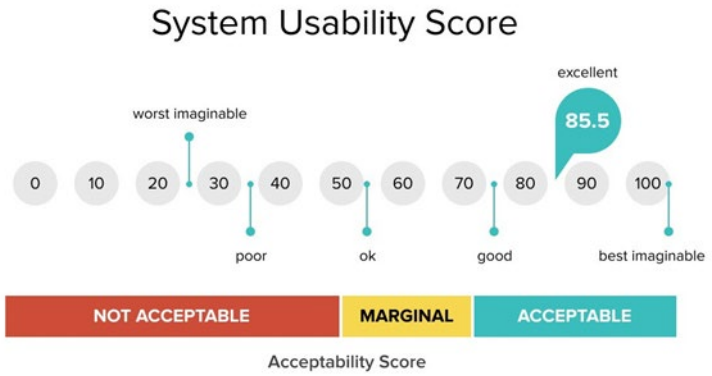



**Figure 9: System usability scale**

## 5. Conclusion

"Personality Career Test" is a Mobile Test Application that determines user personality with Holland Code System where three codes represent user personality and user suitable career. This application is focused on public secondary school student's where the application personality test question's is referred using school's psychometric tests which is "Inventori Minat Kerjaya 2". The application has succeeded in publishing in Google Play Store that can now be accessed by users on Android devices. The application receives an acceptable feedback from users with minor bugs that does not affect the application performance overall. This application serves as a fun exercise for user to find out their personality and their suitable career. Shortcomings of this project is the contents of the application which is still not enough to keep the user entertained for a long period of time. Hopefully more contents added will be beneficial and more entertaining for users to try out this application. In the future, I hope this application can be improved in terms of its UX design and its usability and is available on multiple devices including iOS platform.

**Acknowledgement**

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