

APPLICATION OF OBLIGATORY PRAYER LEARNING BASED ON AUGMENTED REALITY

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ABSTRACT

Prayer is a physical, mental, and spiritual activity that gives good meaning to relationships with Allah, fellow human beings, and oneself. Prayer begins with ablution first to remove najis and hadats. Religion is a rule, guideline, teaching, or system that governs beliefs, beliefs, or beliefs. Islam was revealed by Allah SWT. In Islam, expressing gratitude for every Muslim to the Creator is by praying. Moreover, at this time, the current guidance book on prayer procedures is still running in the delivery of information in the form of text and 2D images. This way is not valuable because it is not mobile style, while currently, human mobility is higher. In this study, we are designing and building a learning application of obligatory prayer based on augmented reality to run on Android-based smartphones and can be studied anywhere and anytime without being limited by space and time. This application contains procedures for ablution and movements of people praying in the form of 3D animation and audio.

Keywords: Multimedia Learning, Learning Obligatory Prayer, Augmented Reality.

1. INTRODUCTION

In Islam, the way to express the gratitude of every Muslim to the Creator is by praying. Prayer is a physical and mental-spiritual activity that gives good meaning to relationships with Allah, fellow human beings and oneself. Prayer begins with ablution first to remove najis a and hadats. The introduction of religious activities such as this prayer, should be taught by parents or teachers from an early age to their children. These efforts are made so that children are able to know more clearly about the guidance of prayer from an early age, which is a golden age for children to develop the ability of religious values. So far, the introduction of prayer activities is still a lot of people who use book media or just see tutorials from the internet, thus making children and some Muslims feel less attractive and tend to get bored more easily. One of the developments in information and communication technology that is currently growing rapidly is mobile phones with the Android operating system. With the need for technology, the learning of obligatory prayer guidance can be made more practical and more interactive on Android-based phones.

Augmented Reality (AR) is an example of technological development in the form of multimedia applications where the application combines 2-dimensional or 3-dimensional virtual objects into a real 3-dimensional environment and then projects these virtual objects in real time. AR technology can be used on Android-based devices, so it is more practical in the fields of education and entertainment. Based on the description above, the researcher will build a learning application of obligatory prayer based on augmented reality. It is hoped that this application aims to make children and all Muslims more enthusiastic, interested in getting to know more about the procedures for performing prayers along with reading in the correct prayer.

2. SYSTEM ANALYSIS AND DESIGN

Based on the preliminary description above, this research aims to make " **LEARNING APPLICATION OF OBLIGATORY PRAYER BASED ON AUGMENTED REALITY** " aims to make children and all Muslims more enthusiastic, interested in getting to know more about the procedures for performing prayers along with reading in the correct prayer.

Modeling is the process of designing software before coding. Modeling a complex system is very important because we cannot fully understand such a system.

USE CASE DIAGRAM

Usecase Diagrams describe the relationships that occur between actors and activities contained in the system. The actor in the system is the user, while the system is an Augmented Reality application.

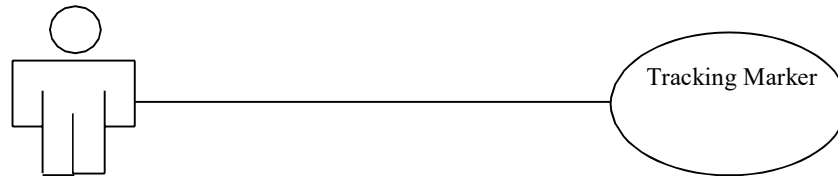


Figure 1. Use the system Diagram Case

In Figure 1 Use Case Diagram, this section describes each description of the Use Case Diagram performed by a user/user. Start from the process of selecting Start Scan, help, about, and exit. Users start to log in using the application and the system will perform marker detection. Once the marker is found then the system renders the object. In the Help menu will be displayed page how to use this AR application. While on the menu about the AR application will be in display information about the developer of the application. The exit Menu is used if the user wants to exit the application.

3. System Implementation

A. SYSTEM ANALYSIS

System analysis is the development of early phases used in decrypting and elaborating the whole parts into the Components section in order to identify and evaluate an application to know the barriers Happen, And the expected needs of the learning Media application of regional musical instruments in Indonesia using Augmented Reality technology can run in accordance with its functions.

B. HARDWARE

System specifications consist of hardware specifications and software specifications used to meet the needs of information systems created during implementation. The following is a specification of the system requirements used:

- a. One laptop unit with the following specifications:
 - Laptop DEL Latitude e5440
 - Processor Intel(R) Core(TM) i5-4300U CPU @1.90GHz2.50 GHz
 - Ram 8 GB
 - Harddisk 500 GB
- b. One Smartphone with the following specifications:
 - Samsung J5 Prime
 - Ram 1.5 GB
 - Internal 8 gb

C. SOFTWARE

The software required by the developer tbuild the application is as follows:

1. OS : Windows 10.
2. Object 3D : Blender 2.7B.
3. Tool Augmented Relity : Unity 2019.4.15fl (64bit)
4. Android Tool : Android SDK

D. OBJECT IMPLEMENTATIONS

After analyzing and designing android-based augmented reality with a blender, the next step is the implementation of the applications that have been made.. In Figure 2. Is a skeleton image in the form of 3D human animation designed using Unity software.

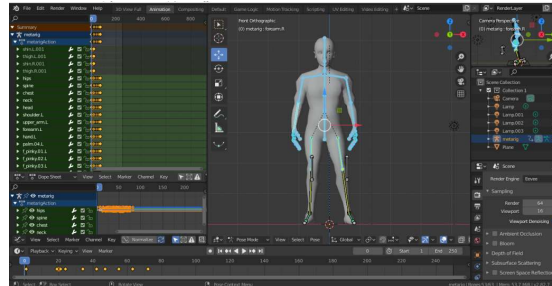


Figure 2. Skeleton Human Objects 3D

After creating a human skeleton in 3D, the next step is to make some modeling movements that will be displayed in the obligatory prayer learning application. Examples of modeling as shown in Figure 3. Object 3D Modeling Human skeleton.



Figure 3. Object 3D Modeling Human skeleton.

E. USER INTERFACE IMPLEMENTATIONS

The interface design is one of the services provided by the operating system as a means of interaction between users and the system, interface design aims to get an application that is user friendly or easy to use (user friendly). The interface design learning application of obligatory prayer based on augmented reality is as follows:

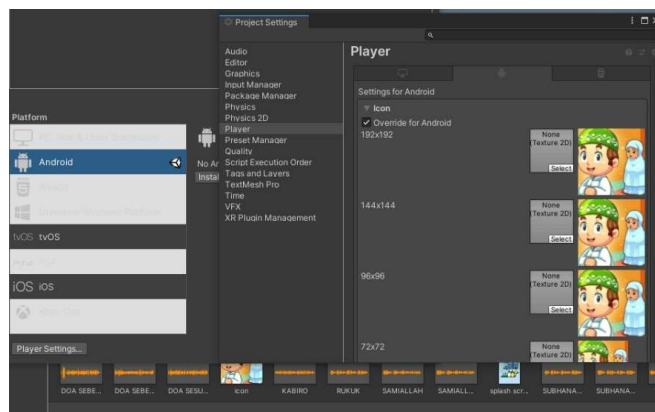


Figure 4. Setting icon on android

In figure 4. This is an example of setting the interface for applications running on Android. In making the icon settings for the android display, the design is done using unity.



Figure 5. Splash Screen.






















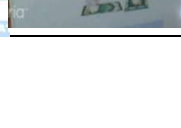
A Splash Screen is a graphical control element that consists of a window containing an image, a logo, and the current software version. The splash screen usually appears when a game or program is launched. In figure 5. is a splash screen image that will appear when the application is first running.

F. TESTING OF RESULT

Tests carried out on learning application of obligatory prayer based on augmented reality contained two tests, that is a testing on 3D marker objects and testing on types of smartphone devices. As shown in table 1. The results of testing on 3D marker objects, are as follows:

Table 1. The Results of Testing on 3D Marker Objects

Movement	Marker Image	Result	Testing of Result
Wudhu and Washing Hands	1. BAYU WUDHU DAN MEMBAJUK TANGAN 		Succeed
Gargle	2. BERKUNYUR 		Succeed
Clean The Nose	3. MEMBERSIHKAN HIDUNG 		Succeed
Washing Face	4. MEMBAJUK WAJAH 		Succeed
Washing Both Hands	5. MEMBAJUK KEPDA LENGAN 		Succeed
Rubbing Head	6. MENGUSAP KEPALA 		Succeed

Clean Both Ears	 <p>7. MEMBERSIHKAN KEDUA TELINGA</p> <p>TATA CARA BERWUDHU</p>	 <p>7. MEMBERSIHKAN KEDUA TELINGA</p>	Succeed
Wet Both Feet	 <p>8. MEMBASOH KEDUA KAKI</p> <p>TATA CARA BERWUDHU</p>	 <p>8. MEMBASOH KEDUA KAKI</p>	Succeed
Reading the Prayer after Wudhu	 <p>9. MEMBACA DOA SETELAH WUDHU</p> <p>TATA CARA BERWUDHU</p>	 <p>9. MEMBACA DOA SETELAH WUDHU</p>	Succeed
Reading Prayer of sholat	 <p>1. MEMBACA NIYAT SHOLAT</p> <p>TATA CARA SHOLAT</p>	 <p>1. MEMBACA NIYAT SHOLAT</p>	Succeed
Takbir	 <p>2. TAKBIR</p> <p>TATA CARA SHOLAT</p>	 <p>2. TAKBIR</p>	Succeed
Reading The Prayer iftitah	 <p>3. MEMBACA DOA IFITTAH</p> <p>TATA CARA SHOLAT</p>	 <p>3. MEMBACA DOA IFITTAH</p>	Succeed
Reading Surah Al Fatihah and Short Verses	 <p>4. MEMBACA SURAH AL-FATIHAH DAN AYAT PENDEK</p> <p>TATA CARA SHOLAT</p>	 <p>4. MEMBACA SURAH AL-FATIHAH DAN AYAT PENDEK</p>	Succeed
Ruku'	 <p>5. RUKU'</p> <p>TATA CARA SHOLAT</p>	 <p>5. RUKU'</p>	Succeed
I'tidal	 <p>6. I'TIDAL (BANGUN DARI RUKU')</p> <p>TATA CARA SHOLAT</p>	 <p>6. I'TIDAL (BANGUN DARI RUKU')</p>	Succeed
Sujud	 <p>7. SUJUD</p> <p>TATA CARA SHOLAT</p>	 <p>7. SUJUD</p>	Succeed
Sitting Between Two Sujud	 <p>8. DUDUK DIANTARA 2 SUJUD</p> <p>TATA CARA SHOLAT</p>	 <p>8. DUDUK DIANTARA 2 SUJUD</p>	Succeed

Reading The Prayer <i>Tahiyat</i>			Succeed
<i>Salam</i>			Succeed

Application testing on several different Smartphones is carried out to determine the functionality of the application. Some Smartphones used for testing have different specifications, As Table 2. *The Results of Testing on Smartphones:*

Table 2. *The Results of Testing on Smartphones*

No	Specification	Hasil Pengujian Smartphone			
		Running of Application	Splash Screen	Conformity of objects with markers	Displaying 3D objects
1	Samsung J5, Android Lolipop 5.1.1, Ram 1.5 Gb, Internal 8 Gb	Succeed	Succeed	Succeed	Succeed
2	Vivo Y51L, Android Lolipop 5.0.2, Ram 2 Gb, Internal 16 Gb	Succeed	Succeed	Succeed	Succeed
3	Samsung Galaxy tab 4 7.0 SM-T231, Android Kitkat 4.4.2, Ram 1.5 Gb, Internal 16 Gb	Succeed	Succeed	Succeed	Succeed
4	Samsung Galaxy tab A8.0 SM – P355, Android Lolipop 5.0, Ram 2Gb, Inter 16 Gb	Succeed	Succeed	Succeed	Succeed
5	Vivo V7 Plus, Android 8.0 Oreo, Ram 4Gb, Internal 64	Succeed	Succeed	Succeed	Succeed
6	Samsung Galaxy S8, Android 7.1 Nougat, Ram 4Gb, Inter 32 Gb	Succeed	Succeed	Succeed	Succeed
7	Samsung Galaxy tab 3V, Android 4.4 Kitkat, Ram 1Gb, Inter 8Gb	Succeed	Succeed	Succeed	Succeed
8	Smartfren Andromax B, Android 6.0 Marshmallow, Internal 8Gb Ram 1Gb	Succeed	Succeed	Succeed	Succeed
9	Xiaomi Redmi 2, Android Kitkat 4.4.4, Ram 2Gb, Int 16Gb	Succeed	Succeed	Succeed	Succeed
10	Samsung Galaxy Tab 2 7.0 P3100, Android Jellybean 4.2.2, Ram 1G, Internal 16 Gb	Failed	Failed	Failed	Failed

4. CONCLUSION

The results of testing the learning application of obligatory prayer based on augmented reality to be run starting from the marker detection process to the object rendering stage. In this test, a marker will be detected first by the camera. Marker detection is done by directing the marker right in front of the camera, so that the entire surface of the marker can be seen by the camera. Based on the stage of the testing process, all of the tested data succeeded in displaying 3D objects in accordance with the test marker image. Testing on markers, the result is that the closer distance to the camera, the faster of a marker is detected. However, when the distance between the camera and the marker is further, the marker

will be detected slower, so that the marker pattern becomes unclear and causes the marker to be undetected. In addition, the speed of the application reading the marker to be scanned is influenced by the intensity of the light, the brighter light, will be the clearer marker. markers are quickly detected. Marker testing on Smartphones is carried out to determine the functionality of the application on each Android version. Based on the process of testing specifications on smartphones, there is one smartphone that failed to install the application because the application can only be run on the minimum Android version of the KitKat version while the Smartphone version is still Android Jelly Bean version.

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