

## Media Learning The Introduction of Fruit with Using Technology Augmented Reality

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### ABSTRACT

*At this time the development of science and technology is growing rapidly, especially information technology. And this research is motivated by the rapid development of technology in the field of education, one of which is AUGMENTED REALITY (AR) technology. This is because the use of Augmented Reality (AR) technology can be implemented as a learning media for the introduction of fruit for kindergarten children, Augmented Reality (AR) is an environment that incorporates 3D virtual objects into the real environment. This is because the use of AR is very interesting and can be developed wider. In this study, Game Engine UNITY was used to build Android-based applications and Visual Studio Code as a text editor to build an application. Accompanied by a book or paper containing a marked image which when directed to the application can display a 3D object visualization. This application can be useful for early childhood, especially at the level of Kindergarten or RA level education in the introduction of fruit. It can be concluded that this application is built capable of displaying 3D object visualization in order to attract students in studying fruits, and the application built is easy to use.*

**Keywords:** *Instructional Media; Augmented Reality (AR); Fruit.*

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### INTRODUCTION

At the moment the knowledge and technology development rapidly, especially in information technology that provides an important role in human life, especially in education office, industry, business, tourism, military and so has use computers and aids smartphone as (Hariono & Putra, 2021). Use of technology now in the pandemic is needed especially in education, where is it now not held learning face to face for high school students, junior high school, primary school, kindergarten all to learning conducted using berani system online and media or use online application as google meet, zoom and other, so students and teachers required to have mobile or computers and can use it (Mushtofa et al, 2021).

Where we know that quality education should be done from early childhood , average age 5 years up the kids are beginning to be read , they tend interested in learning to with a picture or writing is fun, and at this stage the children will more easily remember an image or writing that have colors and attractive form (Amin et al, 2021). In research is used game engine unity based program to build android and .It goes with a book or paper containing a picture dimarker when directed to application to display visualization 3d objects (Sujono & Nugroho, 2019).This application can be a useful tool for early childhood especially at the level education program in kindergarten or ra knowledge of fruit .It can be concluded that the object was built to display 3d visualization to attract students in studying fruits , ease of use and application built.

### METHOD

#### Research Method

Method of development system using the development of a multimedia system version lutherbinanto (Adami & Budihartanti, 2016).

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- **Concept**  
Concept stage ( concept is the stage to determine an objective and who users ( audience ) reality the identification .Other than it is determined kinds of interactive application , presentatif and objectives of the application of whether to made entertainment , training , of learning and others.
- **Design**  
Is the phase designed an interface application of the or material needed to make the application.
- **Material Collecting**  
Material collecting is the stage of collecting materials. The materials collected are pictures, digital photos, backgrounds, finished movies and other supporting images.
- **Assembly**  
The assembly stage is the stage where all multimedia objects or materials are created. Application development is based on the design stage.
- **Testing**  
Application testing is the next stage after the program is completed in its manufacture. System testing that is done is Blackbox testing.
- **Distribution**  
The stage where the application passes the testing stage and is already suitable for use and distribution.

### **Basic Theory**

Dedy atmajaya's research (2017) develops a research idea by presenting the implementation of Augmented Reality (AR), for interactive learning for early childhood. By applying the AR concept to early childhood learning methods, it is hoped that it can create an interesting and fun learning atmosphere (Atmajaya, 2017). Take advantage of this technological development for interactive marketing media, especially home marketing. Augmented Reality (AR) is one of the current technological developments. Augmented Reality (AR), is a technology that combines two-dimensional and three-dimensional virtual objects into a real three-dimensional environment and then projects these virtual objects in real time. This study will apply AR technology to an android-based home catalog (Muntahanah et al., 2017)

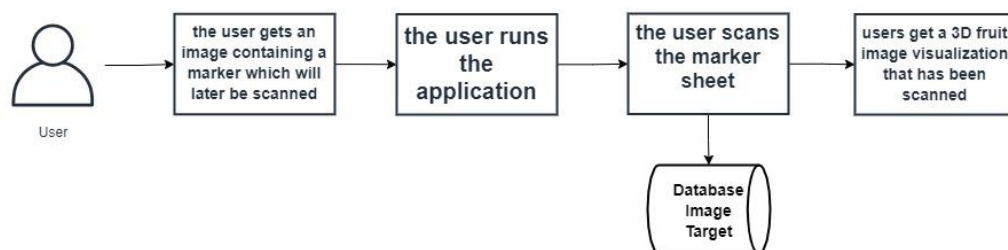
Developing a technology Augmented Reality (AR) into a real environment in real-time. This research will incorporate Augmented Reality technology into the catalog of house sales at the Muna Permai Housing, which will make this house catalog more real with a 3D display on the house. This application runs on the android mobile platform, where later this AR application requires streaming video taken from the smartphone camera as an input source, then this application will detect the image marker that has been created previously using the tracking system, after the image marker is detected, the house model 3D in the catalog will appear above the image marker with a 3D appearance as if the house model is real (Pankratz, 2016)

### **System Planning**

The design is made to help and make it easier to work on the tools to be made. The design of the tool starts from making a block diagram where each block has its own interrelated function so as to form a system of tools to be made.

- **Blok Diagram**

The block diagram of the system can be seen in the image below.



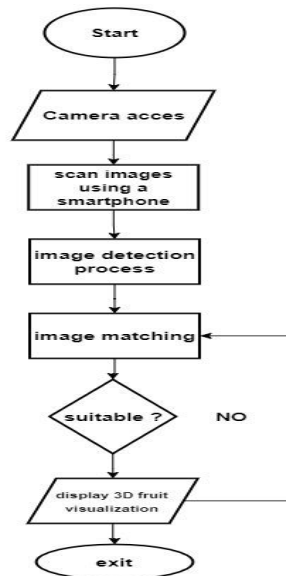
**Figure 1.** Blok Diagram

In figure 1 above it can be seen the description of the working principle of the application, it is known that the first step before running the application is that the user must have an image sheet of the target fruit marker then the user runs the application and selects the scanner or scanning menu where

later the fruit marker will be scanned and the system will retrieve information in the form of 3D objects from the database which will then be visualized to the application so that a 3D fruit image appears.

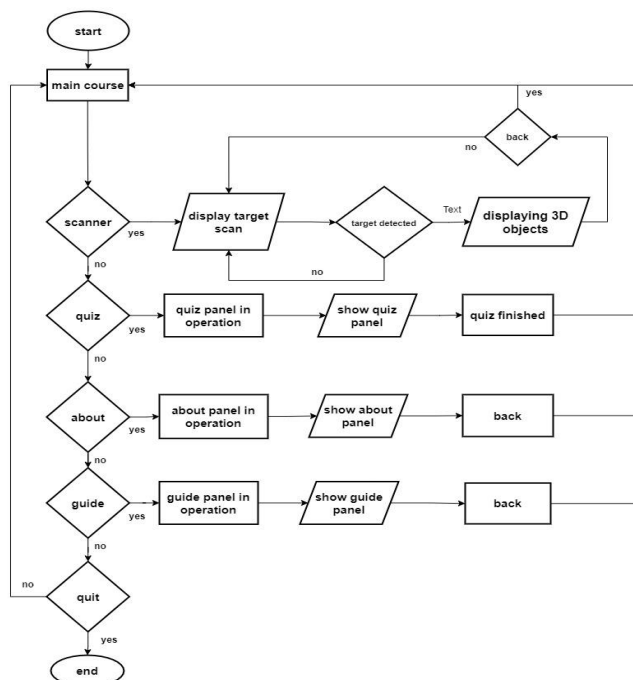
• **Flowchart Augmented Reality and Application**

The augmented reality flowchart will explain the process of scanning markers on the system.



**Figure 2.** Flowchart Augmented Reality

In figure 2 above it can be described that the first step of the system will be to access the camera, then the system scans the image on the fruit marker sheet using the camera on the smartphone, and then the system will detect the image or target image that is used to become a marker on the image on the sheet of paper, then the system will match the image in the book whether it matches the target image created earlier, if it matches the system will display the 3D fruit object that we have created and store in the database. If it doesn't match, then return to the image scanning process until the image on the marker sheet matches the 3D image that has been created.

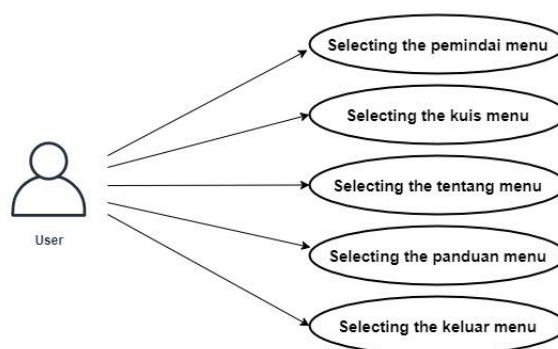


**Figure 3.** Flowcart Application

In figure 3 above is a flowchart application which will explain the process of features that exist in the application that is made. In the picture above, the user will first see the main menu display, then there are four menu options, namely, Scanner, About, Guide, Exit. If the user selects the Scanner menu, the camera will operate to scan, followed by pointing the camera at the fruit marker sheet, if the target is detected, it will display a 3D fruit object, otherwise it will return to the scanning process, if the user selects the About menu, the About panel will operate. and will display biodata from the developer and about the application, if the user selects the Guide menu then the guide panel will operate and display a guide on how to operate this application, if the user selects the Exit menu then the application will be closed otherwise it will return to the main menu.

- **Use Case**

Use Case diagram is an interaction between one or more actors with the system to be created, along with the use case of the application created.



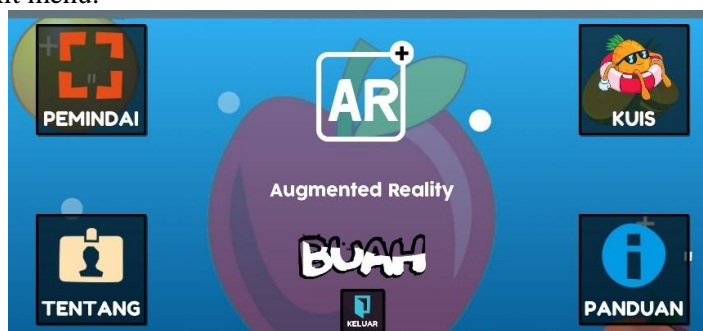
**Figure 4.** Use Case Diagram

In figure 4 above, the access rights granted to the user are in the form of selecting the main menu, selecting the quiz menu, selecting the scanner menu, selecting the about menu, selecting the guide menu, selecting the exit menu, where if the user selects the scanner menu, the application system will operate. the user selects the quiz menu it will display questions that will be answered by the user, if the user selects the about menu then information from the developer appears, if the user selects the guide menu then the guide info appears, if the user selects the exit menu then the application will be closed.

## **RESULT AND DISCUSSION**

### **Main Menu Display**

The main page display contains five menu buttons, namely the scanner menu, quiz menu, about menu, guide menu and exit menu.



**Figure 5.** Main Menu Display

### **Fruit Marker Display**

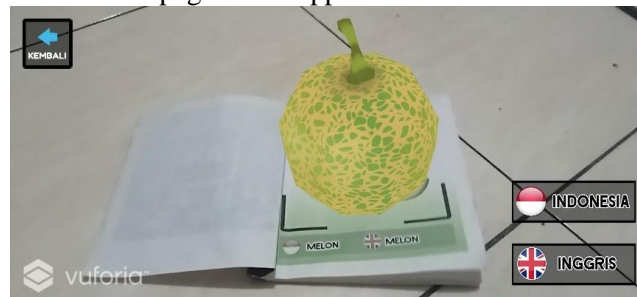
It can be seen that the description of the working principle of the application is known. The first step before running the application is that the user must have an image sheet of the target fruit marker then the user runs the application and selects the scanner or scanning menu where later the fruit marker will be scanned and the system will retrieve information in the form of 3D objects from the database. then it will be visualized into the application so that a 3D fruit image appears. below is an image of a fruit marker where there is an image of the fruit to be scanned and the name of the fruit in Indonesian and English (Rohmah, 2019)



**Figure 6.** Fruit Marker Display

### Scan Marker Display

The scan marker display on the application, there are 2 sound buttons, namely in Indonesian and English and 1 button back to the main page of the application. as shown in Picture below.



**Figure 7.** Scan Marker Display

### Quiz Page View

The quiz page display contains guessing fruit pictures.



**Figure 8.** Quiz Page View

### Display About Page

Display about page, contains information about the developer, and there is 1 button back to the main page of the application, as shown in the image below.



**Figure 9.** Display About Page

**Display Of The Guide Page**

The display of the guide page contains how to operate this application, and there is 1 button back to the main application page, as shown in the image below.



**Figure 10.** Display Of The Guide Page

**Test Result**

Application testing is the next stage after the program is completed in its manufacture. Here are some tests on this application.

- **Test Results On Other Phones**

**Table 1.** Test Results nn Other Phones

Brand	System Operation	RAM	Test Results	
			Status Install	Duration
Redmi Note 9	Queen Cake 10	6	Installed	(2 second)
Realme C2	Pie 9.0	3	Installed	(2,5 second)
Samsung A12	Queen Cake 10	4	Installed	(2,2 second)

Testing is done with 3 different brands of mobile phones and the specifications are also different. The first test was carried out on a Redmi note 9 cellphone with an android 10 operating system with 6 GB of ram, a second test on a realme C2 cellphone with an android 9.0 operating system with 3 GB of RAM, a third test with a Samsung A12 cellphone with an android 10 operating system. From the results of these tests The results obtained can be installed on the three cellphones, but the specifications of the cellphone affect the duration of rendering the application where with a higher operating system and RAM, a faster and shorter duration is obtained.

- **Distance Testing on Fruit Objects**

In the distance test, testing is carried out at a distance of 20, 50, 100 cm, as shown shown in the image below.



**Figure 11.** Display distance 20 cm





**Figure 12.** Display distance 50 cm



**Figure 13.** Display distance 20 cm

Testing on Marker using range the distance between 20 cm, 50 cm, 100 cm. With result all markers can be detected. Success or whether or not a marker is detected depends on image quality on marker resolution and the clarity. The better the marker quality the more it is, the easier it is to detected according to the marker with the distance that has been determined.

### **Discussion**

Based on the results of application testing, has been carried out by researchers, the use of techniques Augmented Reality in this application runs accordingly with planning, which is able to display 3D objects well. However, the response time loading of each device is different related to specifications of the device.

### **CONCLUSION**

After testing the application, introduction of fruits for early childhood in language using Augmented Reality based on android, then the author gets the following conclusions:

- Utilization of Augmented reality technology in this application runs according to the design made is that it can displaying 3D objects and fruits play sound in Indonesian and English. Marker contains 3D objects 30 fruit and information in audio form.
- By utilizing Augmented technology Reality, making learning for students the early age of 4-6 years is very interesting and interactive.
- This fruit recognition application is designed and built using the Unity 3D platform, Blender 3D, coreldraw, Vuforia plugin, android SDK and using method multimedia system development.

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