Augmented Reality Binus Building Using Binusian ID Card

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***Abstract*— Today's technology is faced with various kinds of updates that are increasingly sophisticated, technology continues to regenerate. Currently Augmented Reality is a technology that is being developed to be implemented. By seeing this potential, Augmented Reality is a promising technology. Seeing the number of people who have cards, such as personal identity cards from various agencies, the researcher wants to use the card to present the card agency building. This study aims to create something new to make it easier to introduce and promote a building using a card. The method used in this research project, the SDK used is the Android SDK, Open JDK, Gradle, Vuforia. Based on the results of this study, the card can be presented via a smartphone by scanning the card, then the building will appear on the smartphone screen. With this it is found that the card is not only an identity, but the card can also be developed to support various aspects.**

Keywords—Augmented Reality. Building, Card, Android, Mobile Application

I. INTRODUCTION

Humans are relentless in building and developing. Literally, humans have a nature that is always dissatisfied with what exists, this causes in life there is always development and competition. Technology will experience regeneration. As today, technology is far more developed and sophisticated than in the past, all of this is made to make work easier. Many renewable things are happening, so that many things that were not or did not materialize in the past have become realized today. As time goes by, technology will continue to renew, so it cannot be denied that technological developments will continue until the end of civilization.

Technology is increasingly sophisticated and growing rapidly, as can be seen from the existence of Mobile Applications, Mobile Payments, Artificial Intelligence, Machine Learning, Augmented Reality and others. Currently, Augmented Reality is being developed. Augmented Reality is a rapidly developing technology. In this modern era, all use digital, this causes Augmented Reality to be considered one of the technologies with the greatest potential use, all industrial sectors can use Augmented Reality. Entrepreneurs have taken advantage of Augmented Reality in their products.

Augmented Reality is a virtual object that is overlaid into the real world with details such as animation and text. It's like a technology that adds objects that don't exist in the real world to make it seem like they exist in the real world. Metaiao is an Augmented Reality company that offers products and a variety of development features. Juniao is Metaio's mobile Augmented Reality platform that allows the creation of content channels for the real world [1]. Today's smartphone capabilities have increased, presenting buildings through Augmented Reality is a system created by computer graphics consisting of virtual worlds combined with virtual reality.

This research was conducted to examine the design of Augmented Reality objects used to present buildings. Researchers want to create an application that can present the Bina Nusantara University building by simply scanning the business card. With this, Bina Nusantara students or binusian card holders can introduce the Bina Nusantara campus as well as present the Bina Nusantara building to students who are just about to enter lectures or other people so that Bina Nusantara will be known throughout the archipelago. This can also be useful in promoting Bina Nusantara University.

II. RESEARCH METHOD

The main focus of this research is to introduce and show Binus building with using a card to people or students who will enter college.

A. System Overview

The presented Augmented Reality Binus Building is a combination of binus card and mobile AR application, which runs on a smartphone using android platform.

B. System Implementation

There are several tasks for users to run this app. The first one is to make sure that your smartphone is android. The second task is to make sure your android is the latest version. The third task is pointing the camera at the binus card to scan it. If you see a building appear on the phone screen after you scan the card, then the application is running successfully.

The camera is used to take pictures in the real-world conditions (real world). The movemement of the camera when it detects a marker located in the real world can be adjusted. This position setting is like when the human eye sees an object. To display vital objects in the real-world using computer graphics technology. The computer graphics will detect the marker and will display the 3D object in question. To display in the results of this Augmented Reality is to use a monitor [2].

C. *Tools and Technology*

The SDK used for handling the markers is Vuforia, Gradle, Android JDK & Open JDK. It was chosen since it is a steady and proficient platform for creating AR mobile apps due to its capable technique of the image recognition and the proper technical limitations-handling. It supports 2D as well as 3D contents and provides 512 unique markers for tracking use.. All illustrations are stored in the registered Vuforia account.

Amongst those well-known engines for creating augmented reality applications, this research used Unity3D to place the AR objects above the designated markers, processed using a PC. After that, the result was converted to a mobile application for Android. Moreover, for recording and editing the narrator's voice, the program used was voice memo.

During the development process, we're using C# as a programming language for creating augmented reality applications. This research AR is using Visual Studio Code to objects above the designated markers, processed using a Asus VivoBook. For animation, we're using Blender to support the process.

D. *Design Of Augmented Reality Object*

In this research, there is an AR object. The object is the Bina Nusantara building which is in the real world presented in the digital world. The object is made with the same details so that it looks real and is the same as its original form in the real world using 3 dimensions.

E. *Participant*

Participants in this research are people who have Binus card to test this application.

III. Results and Analysis

The AR application is formed as a mobile application. The mobile device used for this research was a smarphone 6GB RAM, 64GB internal memory, and 16MP camera for detecting Binus card and the application will show you Binus building. Additionally, the operating system was android and in the latest version.

A. *Implementation*

Making this application in the form of a file that has been completed in the build with a file type in the APK format that can be installed and run on the android platform. Then the APK format file has been built using the Visual Studio Code, then the file will be moved to the android platform. Finally, the process of installing the application into the android is carried out, after the installation is complete, the "AR Binus Building" icon will appear on the cellphone screen display.

There are three tasks of ar system on smartphone. The first task is to capture the card through the smartphone camera. The second task is the precise AR objects (3 dimensions models of the building) on smartphone screen. When all those three tasks were efficiently running in the AR mobile application, that system would be considered successful.

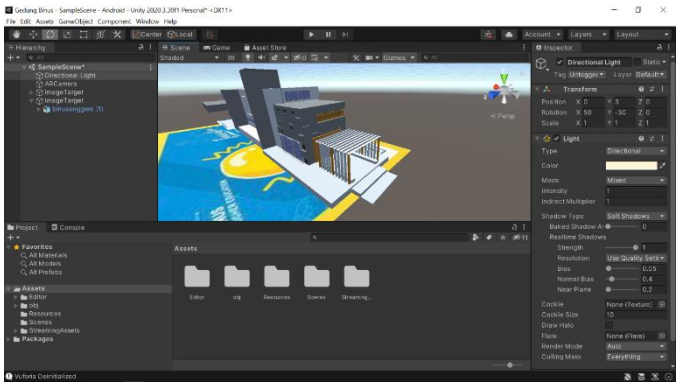

Figure 1. Unity Asset

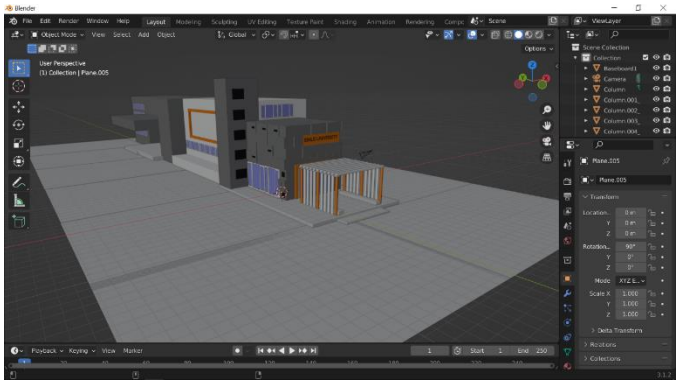

Figure 2. Blender Asset

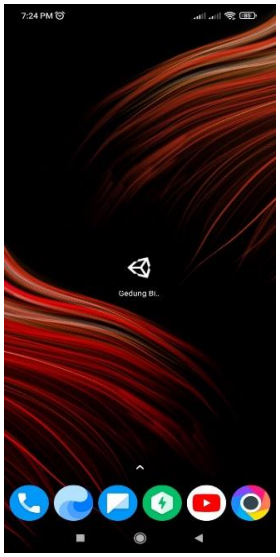

Figure 3. Icon Application

Figure 4. Main Menu

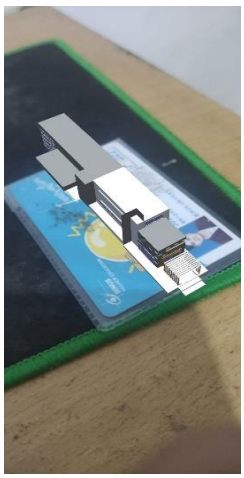

Figure 5. In App Result

IV. Conclusion

Augmented Reality is an excellent technology to be applied in a card because most people have an ID Card. By utilizing a card that most people have an ID Card so with this research the ID Card is no longer just a name identity card, but can be develop into AR to display things can support all aspects needed.

Further research is required for future works, for example, applying the same methods, yet using different designs of AR object. Furthermore, the objective approach for the mobile application could be more comprehensive, not only from storage used, processing, and resource.

Acknowledgements

School of Computer Science, Bina Nusantara University, Malang, Indonesia, has supported this work. Also, we thank people who have provided input to this research.

References

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