

Application for Introducing the History of Islamic Development in the Indonesian Region based on Augmented Reality

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ABSTRACT

The learning media used to introduce the history and development of Islam in Indonesia in education has traditionally relied on books and 2D images, limiting the development of innovative approaches. The purpose of the research is to create an innovation in developing learning media that will capture the interest and enthusiasm of students in learning about the history and development of Islam in Indonesia, using Augmented Reality (AR) technology. The learning media will be presented in a 3D format through AR, making the learning process more engaging and enjoyable. Augmented Reality (AR) combines the real-world environment with computer-generated visuals, blurring the boundaries between the two. AR holds educational value for learning media in schools and can be utilized by teachers and parents. The specific learning media in question is the introduction to the history and development of Islam in Indonesia, which is an essential aspect of learning Islamic history in the region. In this AR-based research on introducing the history and development of Islam in Indonesia, an Android-based application will be developed. The application requires markers as input sources, and it will track and detect these markers. Once a marker is detected, 3D objects will appear above the marker, accompanied by relevant information and audio narration. The result of this research is an augmented reality-based application for recognizing the history and development of Islam in Indonesia.

General Terms

media innovation learning history of the development of Islamic religion in the territory of Indonesia.

Keywords

Islamic History, Augmented Reality, Learning Media, Android.

1. INTRODUCTION

Augmented Reality is a technology that displays real physical environments with computer-generated images thereby changing the perception of reality [1]. Augmented Reality (AR) has a big impact on humans who need media and innovation, especially in the world of education [2]. With Augmented Reality technology, it can make it easier for users to understand because of the attractive 3D objects.

In the world of education, students' interest in learning is decreasing because students' learning media still uses books. Current technological developments require solutions to build teaching and learning media that are more interesting for students. As an interesting learning support for students so they don't feel bored and lazy when studying using learning media such as books, Augmented Reality (AR) technology is needed

[3]. 3D objects are considered more interactive to be used as learning media because the objects look real.

Islam is one of the largest religions in Indonesia. Many residents in Indonesia adhere to Islam [4]. This shows that the development of Islam in all regions of Indonesia has progressed very rapidly. These developments are certainly part of the history of Islamic civilization and its development which students must study. By providing application development solutions that I created, it is hoped that students can better understand the learning process.

This research aims to build an Augmented Reality (AR) based application for learning media to introduce the history of the development of the Islamic religion in Indonesia. And can test the results of the system prototype that has been built.

2. METHOD

2.1. Research Design

This research uses the Research and Development method using the ADDIE development model. There are five stages of ADDIE design: analysis stage, design stage, development stage, implementation stage, and evaluation stage [5]. The developmental stages of this study are described in detail in Figure 1.



Figure 1 Android-Based Media Development Procedure

2.2. Research Method

To generate the author's 3D object using the marker-based method, The marker created for this research is a map of the islands in Indonesia, such as the map of Kalimantan Island. on figure 2 of the map marker of the island of Kalimantan.



Figure 2 Kalimantan Island Marker

In addition to the island of Kalimantan, there are four other markers that use several islands in Indonesia namely Java Island, Sumatra Island, Sulawesi Island, and Maluku Island. To be able to view the History of Islamic Religions, users must download the marker on the download marker menu that has been provided by the researchers on the Download marker menu, to understand how this application works, the author created the architectural model, which is described in figure 3 application architecture.

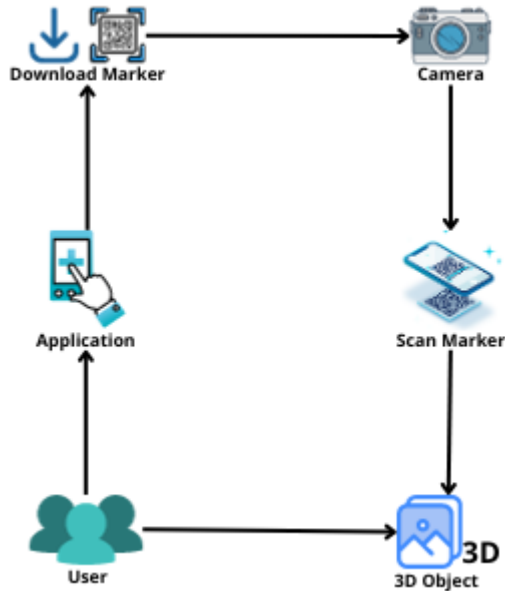


Figure 3 application architecture.

2.3. Research Data

For this research, use a library study where once a researcher sets a research topic, the next step is to conduct research related to the research topic. In the search for theory, researchers from library sources can be obtained from books, journals, research results, and other sources.

This research uses a secondary data source where data obtained, or data collected and consolidated by previous studies or have been published by an agency. As for the secondary data in this study, the events, figures of the spread of the Islamic religion, the beginning of the development of Islam and the process of the occurrence of Islamic development in the territory of Indonesia.

3. RESULT

3.1 Description of Augmented Reality (AR)

Augmented Reality (AR) is the latest technology that gives new colors in the field of education. This study reviews the use of AR and VR in the world of education, especially in the learning process of teaching [6] The research focuses on developing an AR-based application that can help in introducing the history of the development of Islamic religion in Indonesia. The app runs on the android platform, using the device camera as a medium to present content on the app.

3.2 Augmented Reality Content Development

The content development process on the AR application involves events in the history of Islamic religion in the territory of Indonesia. The content of the AR application is designed to cover events, figures, and relics of Islamic history in ancient

times. The author also searched for references in the form of books on the History of Islamic Invasion in Indonesia to ensure the authenticity of the data to be entered into the content of the application.

3.3 Display and Button

The display result of an application created by the author generates an admin web page that contains the input and output of the content to be displayed on the application, and 5 pages of views, detailed descriptions of each view and buttons on the application introduction History of the development of Islamic religions in the territory of Indonesia. On the admin website page there is a menu that contains to edit data, updates, and entire commands to manage the content in the application.

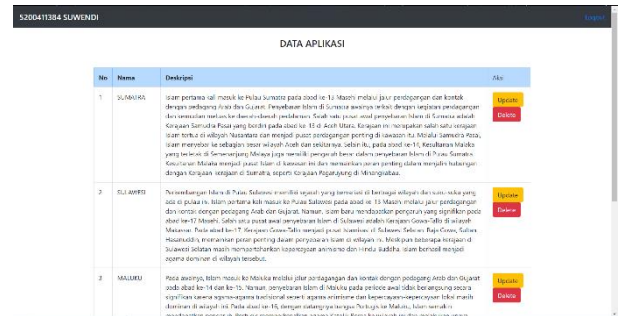


Figure 4 Admin Website Page

On the main page there are AR Scan, Quiz, About, exit, on/off music, download marker buttons. The main menu page appearance can be described in Figure 4 of the main page.



Figure 5 Main Page

When a user has a quiz button, the user will click on a quiz page containing questions and answers options that can train a user's query against Islamic History. The view of the quiz page is described in Figure 5 of the Quiz Page.

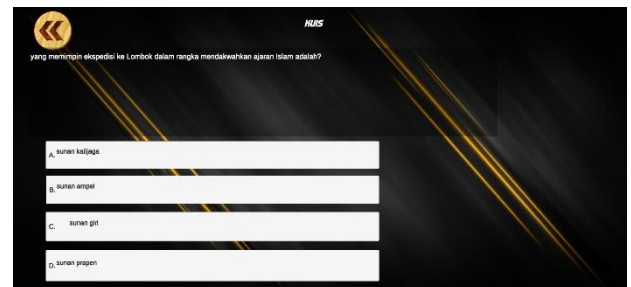


Figure 6 Quiz Page

If the user selects the about button, then there will be a sequential view of about the developer and about the application. The about view can be described in Figure 6 About page.



Figure 7 About page

If the user selects the download marker button, a barcode display will appear containing a link where the user will have access to download a useful marker to display the content in the application. The view of the download marker can be described in Figure 7 Download marker Page.



Figure 8 Download marker Page

Furthermore, if the user selects AR Scan will display 3D objects and Islamic History descriptions based on the island selected by the user. The AR Scan view is described in Figure 8 of the AR Scanning Page.

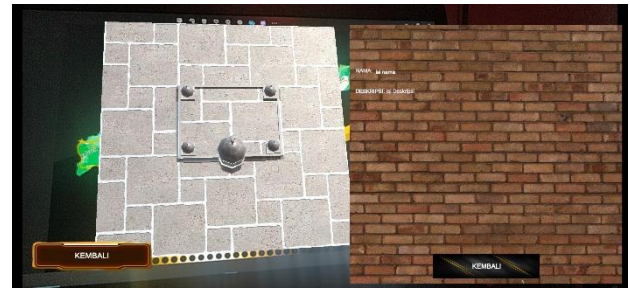


Figure 9 AR Scanning Page

3.4 Implications for Education

The results of this research provide an understanding of the implementation of augmented reality technology as a learning medium and the introduction of the history of the development of Islamic religion in the territory of Indonesia. Implication of education increases the ability to attract learning using augmented reality technology, thus capturing learning experience and growing knowledge of the history of the development of Islamic religion in the territory of Indonesia.

3.5 Analysis of Trial Results

In this research, the testing carried out on the SAI AR application was functional testing (black box). The method used in this testing is black box testing which focuses on the functional requirements of the application being built.

Testing on the SAI AR application is carried out to test each button or button function in the application, so that it is known whether the buttons are by the expected output results or not. Application testing results can be seen in the following table:

Table 1 Pengujian Black box

No	Testing Scenarios	Test Case	Expected results	Results Testing	Conclusion
1	Enter the Scan AR page	Scan AR button	Displays the Scan AR page	When clicking, the user is directed to the AR Scan page and the Camera display to perform the Scan	succeed
2	Go to the quiz page	Quiz button	Displays the quiz page	Displays questions and answer options from the application	succeed
3	Go to the about page	About button	Displays the about page	Displays the developer about page and the application about page	succeed
4	Go to the marker download page	Marker download button	Displays the marker download page	Displays the unduh marker page which contains a QR	succeed
5	Turning the music off and on	Music ON/OFF button	Music lives and dies	When the music is on, there is no red line on the button, whereas when the music is off there will be a red line	succeed
6	Exit the application	Exit button	Exit the application	Displays the main menu of the smartphone	succeed
7	Checking buttons Return to each menu	Back button	Exit a view	Exit to the previous menu on each click of the back button	succeed
8	Scan AR testing	Point the camera at the marker	Displays 3D objects	Displays 3D objects according to the markers and all markers have been tested and successfully display objects according to those in the database	succeed
9	Displays description	Description button	Displays description	Displays a description in the form of the island name and an explanatory description regarding the detected island	succeed

4. CONCLUSION AND SUGGESTION

In conclusion, the development of an application to introduce the history of Islamic development in the Indonesian region

based on Augmented Reality (AR) shows promising prospects. This application utilizes AR technology to present interactive and engaging Islamic history content to users.

Through the implementation of AR technology, users can experience deeper and more enjoyable learning experiences. Furthermore, this application can serve as an effective educational tool in introducing Islamic history to the younger generation in Indonesia.

The results of testing indicate that the application functions well and provides a satisfactory experience for users. However, further development is still needed to enhance functionality and the presented content to make it more comprehensive and informative.

Overall, this application has the potential to become a significant tool in efforts to introduce and broaden the understanding of the community regarding the history of Islamic development in the Indonesian region.

5. ACKNOWLEDGMENTS

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Technically, the application of Augmented Reality technology as a learning medium the history of the development of Islamic religion in the region of Indonesia demonstrates success in creating interactive and interesting applications. Selection of significant content elements, such as historical buildings, descriptions, and historical events can be effectively integrated into an augmented reality (AR) environment, creating an engaging user experience.

This research opens up the big context of Augmented reality (AR) users in the context of education and introduction to Islamic history. SAI AR application can be used as an innovative learning media and advice for learning History of Islamic development in Indonesia. Some suggestions can be given to recommend conducting a user study or user satisfaction survey of this AR application, to get direct input

from the user about features, user interfaces, and user experiences that can be improved or improved and to add more interesting 3D objects.

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