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A Tourism Introduction Application Using Augmented Reality

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ABSTRACT

Tourism is a journey from one place to another. Whether it is an individual, a group, or a company, participants on this trip are interested in mental balance, such as reducing stress, entertaining themselves, and refreshing. A tourist attraction is one of the products or advantages of an area, where the region can create income and attract tourists to their tourist destinations. One way to promote tourism more attractively is with augmented reality media. This tourism introduction application using Augmented reality technology aims to make it easier for tourists to get to know tourism with interactive media. This tourism introduction application is needed for promotional media, including video playback features of Augmented reality technology and information about tourism. Augmented Reality is a real object in an area map that will become a marker object by detailing the tourist plan. A scan can be carried out to display 2D images, text, audio, and video with the android platform so that it can make it easier for users to use it. This research aims to design and build a tourism introduction application with the Application of Augmented Reality Technology. This research uses the Multimedia Development Life cycle method, with six stages: concept, design, material collecting, assembly, testing, and distribution, with the testing method using alpha and beta tests. The results of this research are in the form of an Android-based tourism introduction augmented reality application. This application can give contributions to assist tourists in finding information about tourism in an area and help the Department of Tourism and Culture promote tourism in the region more attractively.

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1. INTRODUCTION

Technology development can make it easier for humans to achieve goals; technology is widely applied in various fields such as organization, industry, health, government, and education. One of the technologies that are developing is Augmented Reality (AR). Augmented Reality Broadly speaking, it has a function that can combine natural objects with virtual objects so that they look real[1]. Augmented Reality will be applied to introducing tourist attractions, especially in Garut Regency.

A tourist attraction is one of the products or advantages of an area, where the region can create income and interest. So that it can attract tourists to tourist destinations[2], of course, this is an essential requirement in improvement to introduce tourism advantages owned by Garut Regency. The tourist attraction is one of the places in great demand by the public to take advantage of their spare time. The introduction of tourism for tourists is a necessity traveling to get information from each tour to be visited. With this, it is necessary to have information or knowledge that can assist in delivering tourist attraction introductions.

In this case, knowledge about tourism objects, especially in the Garut Regency area at this time, is still minimal considering that Garut Regency tourism is increasing and growing, and knowledge is packaged

in the form of public media such as e-mail, brochures, texts, and articles, and social media and the absence of information that is interactive with the latest technology using

In this case, knowledge about tourism objects, especially in the Garut Regency area, is still minimal considering that Garut Regency tourism is increasing and growing. Knowledge is packaged in the form of public media such as e-mail, brochures, texts and articles, and social media and the absence of interactive information with the latest technology using Augmented Reality. Therefore, introducing tourist objects with interactive media by applying Augmented Reality Technology. A natural thing in the form of a map of the Garut Regency area will become a marker based tracking object that directly seeks information from an image. Where a specially designed marker is needed to bring up the object that will be presented after the tracking and positioning process is carried out by detailing the tourist plan, so that a scan can be carried out which will display 2D objects [3], text, images, audio, and video. Therefore, introducing tourist objects by applying Augmented Reality technology will increase the attractiveness of tourists and can increase knowledge about the tours to be visited.

The related research that became a reference in this study is a website-based tourist information system that focused on a website-based tourist information system was carried out by[4]–[6]. The second research was carried out by a group of authors, who have authored a paper entitled Design of a Tourism Mapping Information System Based on Geographic Information System and Android [7]. The third research was to introduce the solar system using augmented reality technology [8]. The fourth research was conducted by [9] titled Application of Tourist Attractions in Bengkulu Province Using Android-based Augmented Reality (Video Playback) Technology [9]. Further research applied to mark technology, which produced AR applications by implementing user-defined target methods.[10]–[12]. Based on reference-related research, this research takes A Tourism Introduction Application Using Augmented Reality.

This application contribution can assist tourists in finding information about tourism in an area and help the Department of Tourism and Culture promote tourism in the region more attractively.

2. METHOD

The methodology used to create tourism introduction media in this study is Multimedia Development Life Cycle (MDLC). This methodology has six stages: Concept, Design, Material Collecting, Assembly, Testing, and Distribution[13]. Using MDLC will be easier to understand and implement in a clear and structured manner[14]. To achieve this goal, make a Work Breakdown Structure as shown in Figure 1.

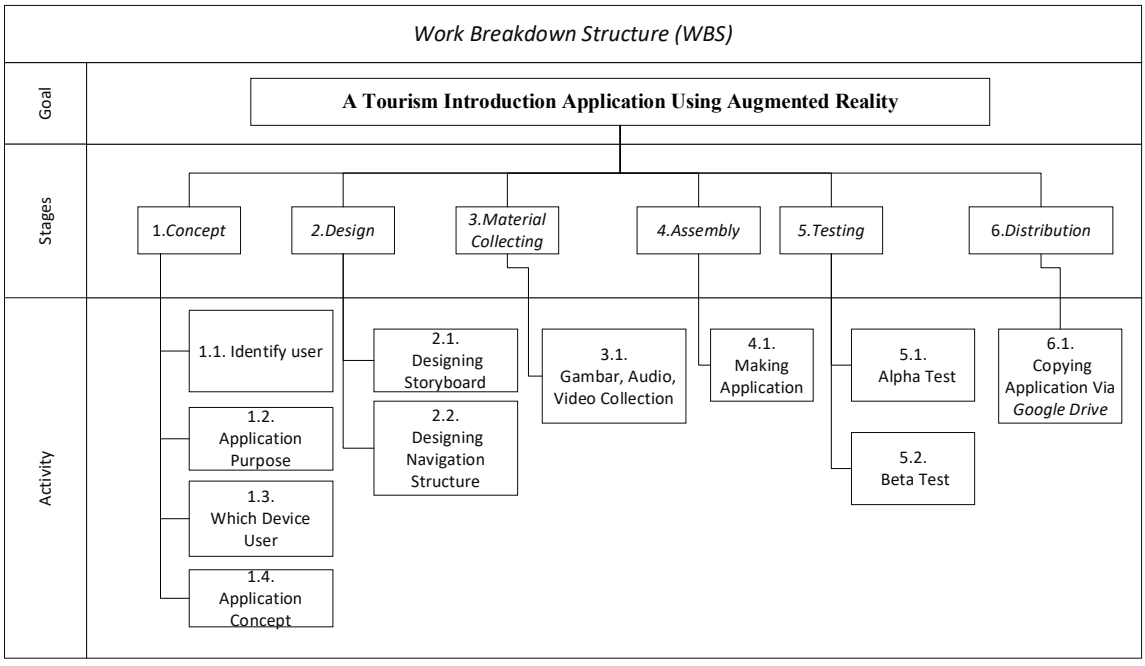

Figure 1. Work Breakdown Structure (WBS)

Work Breakdown Structure (WBS) is a structured diagram from top to bottom to ensure that the components remain on the product goals with detailed descriptions [15]. The early stages in WBS are concept (concept). This stage is to define the purpose, the target user of the application, the device to be used, and make the concept of the application. Then in the second stage, the design of this stage defines the specifications of

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the program architecture, layout, style, and appearance of the application; in this activity, there is the creation of storyboards and navigation to facilitate the elaboration of each application structure. Then the third stage is Collecting materials. This stage defines the collection of materials needed at the time of making the application, such as images, videos, audio, and text. Entering the fourth stage, namely assembly (manufacturing), where at this stage is implementing the previous step, which includes making a tourism introduction multimedia application that results from a combination of sound, video, audio, and text. Then the fifth stage is testing. In this stage, two testing methods are carried out, namely alpha testing and beta testing. For alpha testing, they were only trying from its function. If there is an error, the identified error will be corrected. Testing beta knows the process, feasibility, and design of the application's user interface by involving specific users to get feedback. The sixth stage is Distribution (Duplication). The activities carried out at this stage are duplicating files in the form of .apk which are uploaded via storage media google drive

3. RESULTS AND DISCUSSION

This application is ready to support A Tourism Introduction Application Using Augmented Reality. The stages carried out in this research are based on Concept, Design, Material Collecting, Assembly, Testing, and Distribution in MDLC methodology.

3.1. Concept

At the concept stage, several activities are carried out from this stage, including identifying users, determining the purpose of making the application, then creating a concept, and collecting materials to be used**.**

1. The stages of user identification of the concept of activity carried out are searching for data sources utilizing literature studies and interviews, the data that has been collected at the data search stage, then the application of tourism introduction media is shown to tourists and primary education
2. The purpose of the application in this study is to help tourists and primary education find out what tourism is in Garut Regency. Not only that, but this application also allows the Garut Regency Tourism and Culture Office to increase promotion and information.
3. The device used for media platform in this application which is aimed at android smartphone with a minimum of Kit-kat operating system
4. The application concept. From the user identification stage to the stage of determining the device. From the application, the idea is to produce an application. The application will be made in the Unity3D software.

Table 1. Description of the Application Concept

No	Name feature	Description
1	Title	Garut Travel Introduction Application
2	User	Tourists
3	Feature	Loading screen, menu, Augmented Reality, Swipe up/down, about the excursion, zoom in/out, help.
4	Picture	Picture, Background, button with .png format
5	Videos	Excursion videos in .mp4 . format
6	Audio	Background and Audio button with .mp3 format
7	Interactivity	Loading screen with fewer than three seconds, the main menu with four buttons scan AR, tutorial, about, and exit accompanied by a popup. AR scan accompanied by Augmented Reality video playback features and a menu about tourism with a description.

3.2. Design

In the design stage, the activities carried out are designing storyboard and navigation, doing designing storyboard To determine the storyline and actions of each page in the application, designing navigation is intended to describe the flow of each movement function between pages that are connected. Here's part of designing the storyboard and navigation structure.

1. Designing a Storyboard in table 2 provides an overall description of the application to introduce Garut tourism.

Table 1. Storyboard Application

No	Scene	Description
1	1	Loading screen
2	2	Main menu
3	3	Menu *scan* tourism AR
4	4,	Menu tourism kategori
5	5, 6, 7, 8	Menu tourism about
6	9	Tutorials
7	10	About application
10	11	Exit

2. Designing the navigation structure, the following is the design of the navigation structure in the application for introduction to Garut tourism.

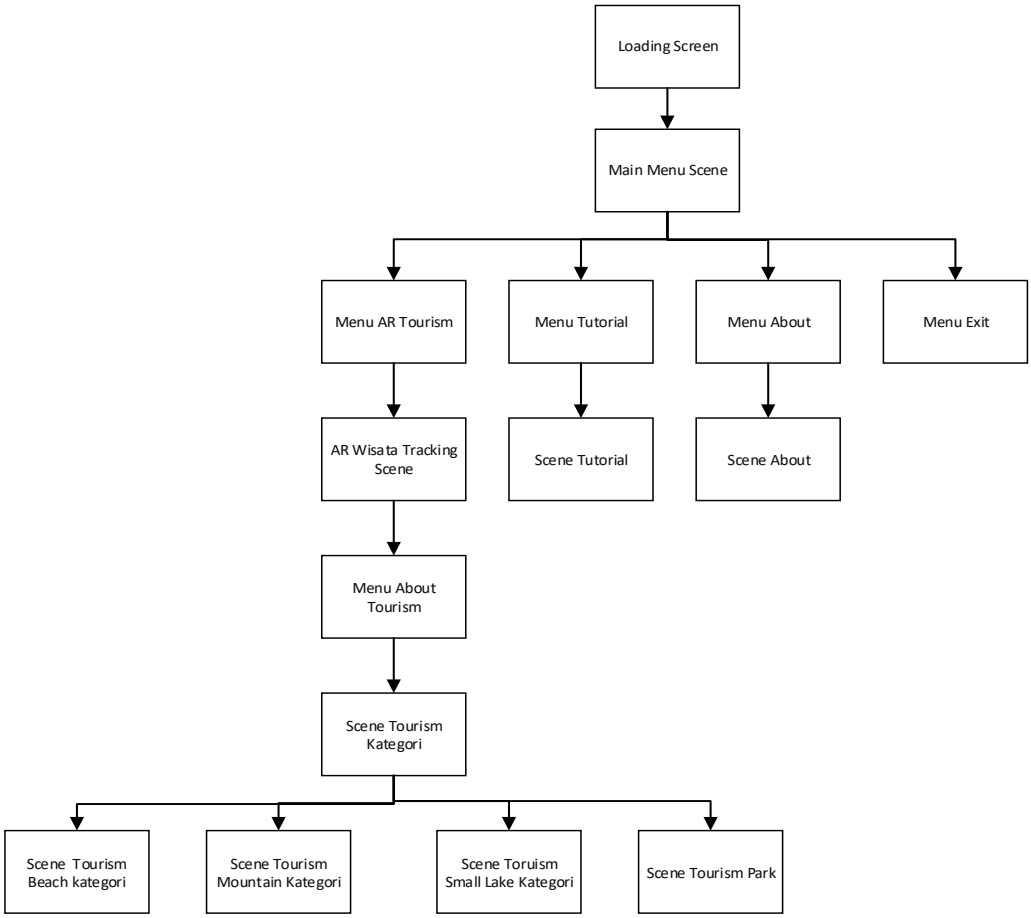

Figure 2. Structure Navigation

3.3. Material Collecting

In stages collecting materials, It is necessary to search for materials for application needs such as images in .jpg format, .png, icon video in .mp4 format, and audio in .mp3 format. The activities carried out at this stage are looking for material from the internet media. The following explains each activity carried out in the collection of materials.

Image Material Collection, data collection for images in the form of files such as those in .jpg, .png, .ico formats as needed in making applications, as for the process of drawing and editing the image as shown in Figure 3:

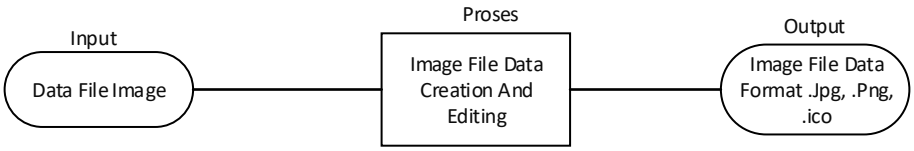

Figure 3. Image Material Collection Process.

In this activity, making sound in the application will make the application look attractive, including a back sound and sound on each button. The format of the sound is .mp3. The following is the collection of voice data used in the visible application on the table.

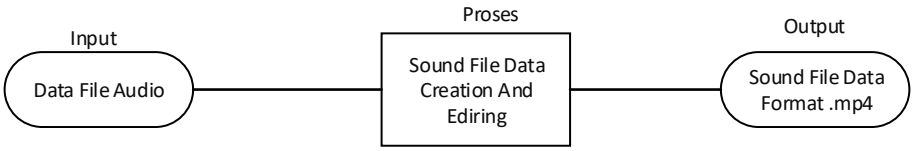

Figure 4: Audio Material Collection Process

In this activity, namely the collection of video material that will become a need for AR content material on the application, in the collection of videos files video, namely the search method using the internet and then downloaded as needed. The formats used are .mp4 and .mp3 to be processed return.

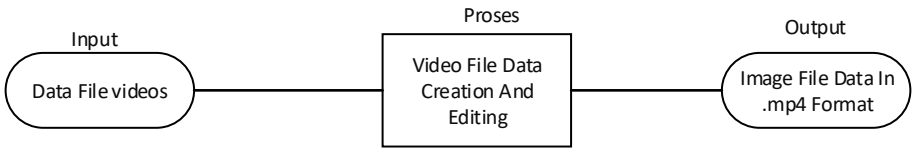

Figure 5: Videos Material Collection Process

3.4. Assembly

This stage is an application-making activity from several steps that have been carried out previously. Starting from the concept stage, designs, storyboards, navigational structure, and collection of materials. In the form of images, sounds, and videos, which will be implemented from each material that has been collected into the software unity 3D 2019 V.3 and using software developer EasyAR Android SDK to be assembled according to the design that has been made.

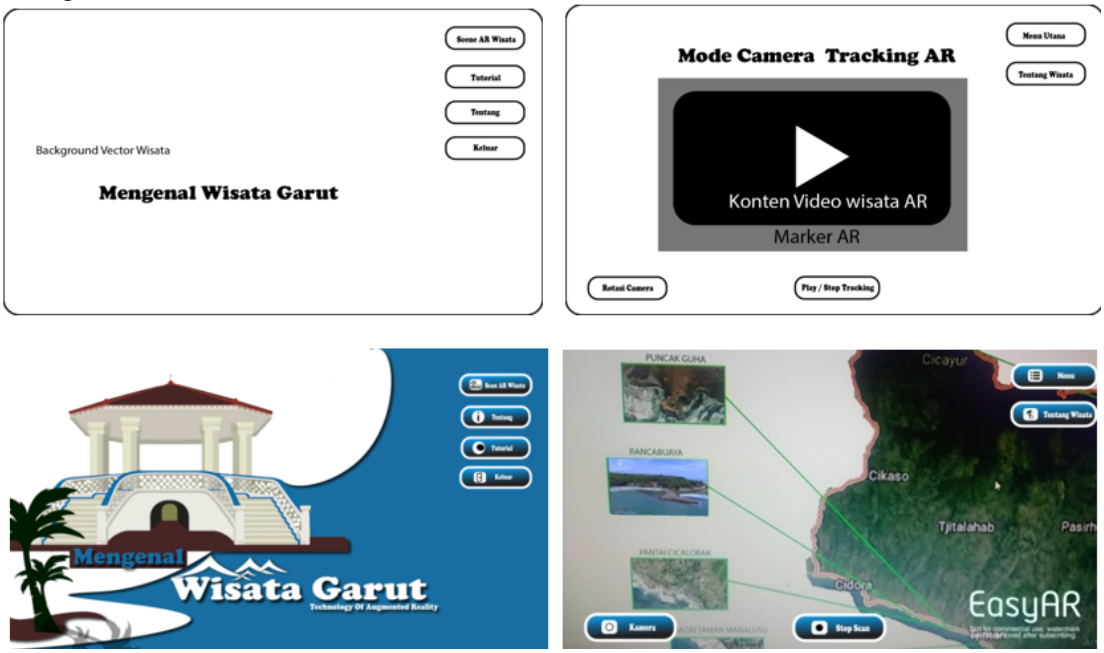

Figure 6. Garut Tourism Introduction Application Display

3.5. Alpha and Beta Testing

In this stage, to test alpha testing for application function of each page, the role of the button, 2D display, the sound that comes out. From this test, if there is an error from each of the existing functions, the application will be corrected according to the problems found. The test results are successful when testing one by one starts from page to page, tracking markers and buttons.

In the testing process, beta test. This is a test to get information about the quality of the application by involving the user as the test medium in the process test. This results in the number of feedback from every tester, and the figure is 76% feedback smooth application and 24% that do not fit according to testers.

3.6. Distribution

This activity is the final process where the manufacturing results have been carried out in the assembly stage, then the application testing process. The application is temporarily stored on Google Drive media for the distribution process of applications with .apk format.

4. CONCLUSION

From the research that has been done, It can be concluded that an Android-based Tourism Introduction Application Using Augmented Reality application has been made. This study uses the Multimedia Development Life Cycle (MDLC) methodology with stages starting with Concept, Design, Material collecting,

assembly, testing and distribution. This application is designed by applying Augmented Reality technology, and this application can help media information about tourism in the Regency area. The suggestions for future research are adding a category of natural tourism, adding the Distance feature from where the user runs the application to the registered tourist destinations, Add information in the form of facilities from each tour in detail.

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