Augmented Reality Portal 360 Degrees Tourism "Bundaran Balanga" Sampit

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A R T I C L E I N F O

A B S T R A C T

The tragedy that occurred in the Sampit area 20 years ago was commemorated and immortalized by the local government with the construction of the "Bundaran Balanga ". Initially, the roundabout was only a monument made of wood which became a symbol of peace which was later enhanced with typical Dayak ornaments which became historical tours for tourists. However, information about this history cannot be obtained by tourists or people who visit there or who want to visit the place because there is no media and supporting technology for this tour. A tourism application was made to introduce the history of the Balanga roundabout accompanied by Augmented Reality which can display a 360 degree view of the object. The data collection method is done by interview, documentation, observation and literature study. The stages of this research include concept, data collection, analysis and design, implementation and testing. This tourist application provides information about a complete description of the history of the Balanga Roundabout including the location and distance traveled along with photos. As for accessing Augmented Reality you have to scan the QR Code. This application helps provide information about the history of the Balanga Roundabout and tourists can feel as if they are in that location with a 360 degree view around it.

1. Introduction

Each region has its own characteristics and has its own uniqueness. These characteristics can be in the form of culture and even history that distinguishes it from other regions. Sampit is an area in East Kotawaringin Regency, Central Kalimantan Province. About 20 years ago, Sampit experienced a conflict between the Dayak and Madurese tribes. It is hoped that in the future, this conflict will never be repeated and differences in society must be interpreted positively.

The history of areas such as the Sampit area can be an attraction for tourists and can also be used as a medium of information and knowledge. The history of Sampit is very minimal, even if you want to know the history of Sampit, you have to sort it out from the history books of Central Kalimantan [1]. Until now, outsiders only know this place as a building that can be enjoyed to relax because there is also no information and stories available. history that can be accessed freely or online.

One way to preserve the building and the story behind this historic building is to do promotions[2]. The importance of this information being known by the public is the reason for the need to use technology as a publication media that must be built with attractive features to attract tourists. One of the technologies that are currently developing is Augmented Reality. Augmented Reality is a technology that can incorporate 3D

objects into a real environment [3]. Unlike virtual reality which completely replaces reality, Augmented Reality only adds or completes reality [4]. The advantage of using Augmented Reality technology is that it can make information learning facilities more interactive and interesting [5]. In a study conducted by Xenna Rambing et al who stated that the concept of video or 360-degree cultural photos of a tribe could introduce and raise the cultural potential of an area by more interesting [6]. In addition to the aim of elevating local culture so that it is better known, the use of technology also strongly supports tourism promotion in an area such as research conducted by Ananda Risya Triani et al regarding the promotion of the tourism potential of Bandung City using Virtual Reality which is able to create a visual destination that is displayed as a whole (experience). space), thus generating interest for potential tourists who want to visit Bandung City tourist destinations directly [7]. The difference between Virtual reality and Augmented Reality is in the environment that is displayed. If Augmented Reality displays objects as if the user is in the created environment while Virtual Reality is made the environment resembles the original object where the user fully enters the created environment. In other words, Augmented Reality combines the real world with virtual elements, while Virtual Reality pampers its users by inviting users to enter and experience new interactions in the virtual world. Virtual Reality can be enjoyed with special devices such as VR headsets[8]. Usually, VR headsets need to be connected to a laptop or PC with a certain minimum of specifications so that users can experience the desired experience [9]. This Balanga Roundabout Historical Tour is made in the form of Augmented Reality so as not to lose the charm, taste, natural atmosphere and cultural values that exist at the Balanga Roundabout even though they are not in the location because users can feel as if the cool breeze and natural sounds of Kalimantan are so touching. If created using Virtual Reality will require additional equipment for users who want to enjoy it.

This study aims to publish information about the Balanga Roundabout as a tourist with historical value by creating an easy and interesting feature, namely Augmented Reality. Information about descriptions, photos, videos and detailed locations of the Balanga Roundabout can be obtained through an application that can be accessed via Android devices. Meanwhile, to display Augmented Reality, users must scan the QR Code using the Snapchat application on an Android smartphone and Augmented Reality 360 degrees Balanga Roundabout will be displayed. Users can enjoy the view and state of the Balanga Roundabout in various angles.

2. Research Method

This research was conducted in several stages, namely:

2.1 Concept Creation

Making the concept of this application is divided into 2, namely the concept of online and offline applications. An online application is an application that provides information about the Balanga Roundabout which can be accessed directly through an android device. While the offline concept is that users can scan the QR Code on the East Kotawaringin travel book. Next, create a concept for the content displayed on the Balanga Roundabout Application, which includes icons, images and information that will be displayed. Second, create an Augmented Reality project concept in the form of a 360-degree portal. The portal consists of several materials that must be made to produce an Augmented Reality display, namely icons, photos, textures, backgrounds and others.

2.2 Data collection

After the concept is created, then the data collection needed to build an application according to the concept is carried out. Data collection is done by interview, documentation, observation and literature study.

1) nterviews were conducted with the Department of Culture and tourism and the history of East Kotawaringin to obtain real data on the history of the Balanga roundabout. The results of the interview obtained data about the Balanga Roundabout in the form of a complete description and explanation along with location information.

The evidence of the East Kotawaringin tourism book obtained from the Culture and tourism Service regarding the Balanga Roundabout is shown in Figure 1 below.

Fig. 1 Description of Balanga Roundabout in the KOTIM Travel Guide

Information on the location of the Balanga Roundabout along with the coordinates obtained from the Culture and Tourism Office of KOTIM is shown in Figure 2 below:

Fig 2. Detailed Information of Balanga Roundabout

In addition, interviews were also conducted with people who visited the Balanga Roundabout and people who had never visited the Balanga Roundabout to obtain information about public knowledge about the history of the building.

2) Documentation is done by collecting and taking 360-degree photos and videos directly to the location using the SJCAM SJ360 WiFi Mini Panoramic VR Camera. The resulting 360 photo of Balanga Roundabout is shown as in Fig 3.

Fig 3.360 degree photos of Balanga roundabout from 360 camera

3) Observations were made by observing visits and people's curiosity about the Balanga roundabout.
4) A literature study was conducted to support this research by reviewing and comparing similar studies.

2.3 Analysis and Design

After the concepts and data have been collected, an analysis of user needs is carried out for these two types of application concepts. Then the design of the concept is carried out. Users here are tourists, so samples are taken from interviews with people who have and have never been to the Balanga Roundabout. From the results of the interviews obtained some information that became the basis for describing user needs, namely as follows:

1) For prospective tourists who want to visit the Balanga Roundabout, they need to know what the Balanga Roundabout is, where it is located, what facilities are there, the distance to the location, as well as the conditions around the location, the scenery and the comfort of the users when they are there.

2) For tourists who visit the site, apart from physical information about the building, the story behind the shape of the building becomes a question for tourists, why the ornament and shape of the building was made, is there any historical and cultural value in the building. So, the importance of information regarding the historical explanation of the building.

3) Information presented in the form of text alone will make you bored and bored. The need for an attractive feature design for users.

Based on the description of the user's needs, an Android-based application design was made that can be accessed by users easily with several features, namely:

1) The Android application will display information about the Balanga Roundabout in the form of text including addresses, descriptions, coordinate points that are connected directly to the map, facilities, history, photos and links to videos explaining the Balanga Roundabout.

2) The android application will be connected to the Augmented Reality feature via a link to the snapchat application. The snapcaht application is a separate application from this android application. Through the snapchat application, the QR code of the Balanga Roundabout must be scanned to be able to display the Augmented Reality of the Balanga Roundabout. The QR code can be found in the East Kotawaringin Travel Guide book and also through the Balanga Roundabout information page on the android application.

3) This android application is named "Explore the Balanga Roundabout". This android application interface design consists of several pages, namely:
   a) *Splashscreen* aplikasi "Explore Bundaran Balanga"
   b) *Homescreen* with the text display "Bundaran Balanga" with the *Explore* and Augmented Reality buttons
   c) Balanga Roundabout Information Page
   d) Balanga Roundabout information detail page

The splashscreen interface design can be seen in Figure 4 below:
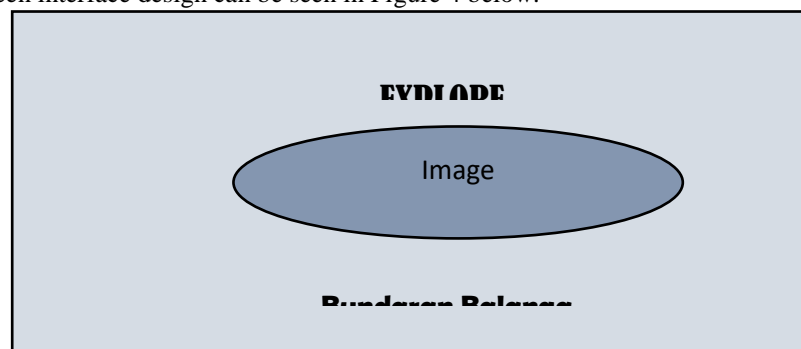

Fig. 4 Desain Interface Splashscreen Explore Bundaran Balanga

The design of the Balanga Roundabout Homescreen interface can be seen in Fig 5 below:
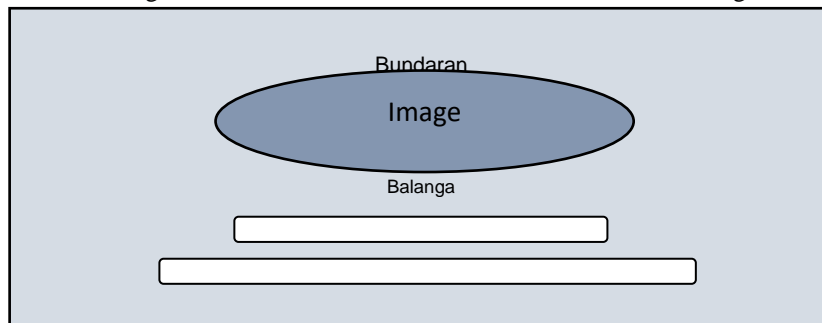

Fig 5. Desain Interface Homescreen Bundaran Balanga

The Explore button as in Figure 5 above will display the Balanga Roundabout information page, while the Augmented Reality button will go to the Snapchat application and exit the Balanga Roundabout Explore application.

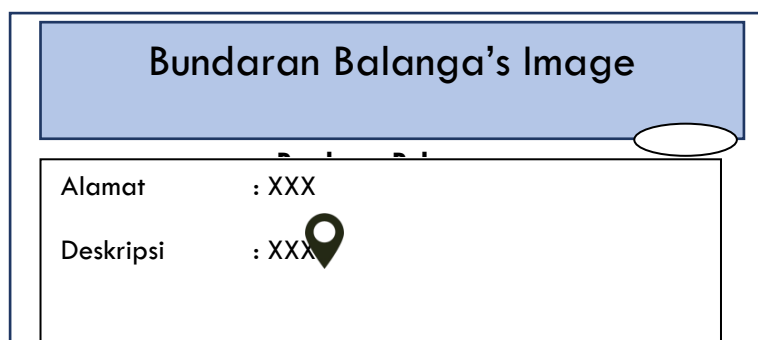The interface design for the Balanga Roundabout information page can be seen in Figure 6 below:

Fig 6. Interface Design of Balanga Roundabout

The Detail link will display a detailed information page of the Balanga Roundabout which includes 360-degree photos of the Balanga Roundabout, an explanation video of the Balanga Roundabout and a 360-degree video which can also be accessed via YouTube and the QR Code Augmented Reality of the Balanga Roundabout. The interface design for the detailed information page of the Balanga Roundabout can be seen in Figure 7 below:
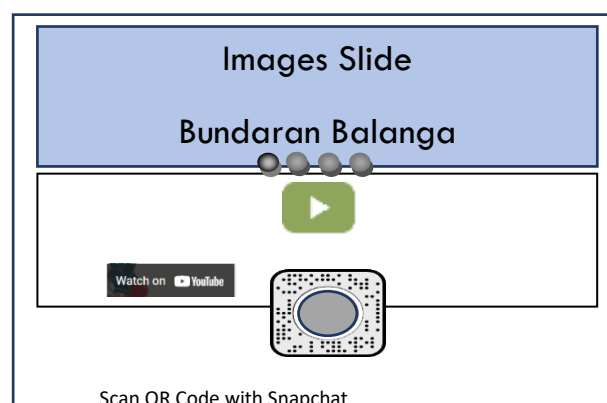

Fig. 7 Design Detailed Information Pages of Balanga Roundabout

Fig. 7 Design of the Detailed Information Page of the Balanga RoundaboutThe Augmented Reality feature was created and designed using the Lens Studio Application. The final result of the project is then published to produce a QR Code that can be downloaded. The project design consists of materials in the form of images, textures, models that form a portal of several shapes and also images. 8 following:

Fig 8. Balanga Roundabout 360 Degree Portal Interface Design

1. Implementation
    After the design, the application is ready to be made and implemented.
2. Test
    After implementation, testing and evaluation of the application is carried out. Application Test using UAT (User Acceptance Test) with users from the Department of Culture and Tourism of East Kotawaringin Regency and the community. Evidence of Application Test to the Department of Culture and Tourism of East Kotawaringin Regency can be seen in Fig. 9 following:

Fig 9. Application Test by Head of Disbudpar KOTIM

3.   Results and Analysis

The application of technology to support the publication of the Balanga Roundabout as a historical tour of Sampit is categorized into two types, namely:
a.   Android-based Balanga Roundabout Application
b.   Augmented Reality Balanga Roundabout
The first application of technology is the Android-based Balanga Roundabout application called "Explore Balanga Roundabout" which provides detailed information about the Balanga Roundabout. The Splashscreen Explore Balanga Roundabout can be seen as shown in Fig. the following 10.

Fig 10. Splashscreen Displays Explore Balanga Roundabout

After the splashscreen is displayed, it automatically goes to the homescreen page as shown in Fig. 11 below.

Fig 11. Homescreen Explore Balanga Roundabout

If the Explore button is pressed, it will go to the Balanga Roundabout information page as shown in Fig. 12 following:

Fig 12. Information Display of Balanga Roundabout

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To find out location details and also panoramic photos of the Balanga Roundabout, it can be accessed via the map button as shown in Fig 12 above which is circled in red. If the button is clicked it will go to the Google Maps page which displays a map of the Balanga Roundabout location as shown in Fig. . 13 following.

Fig 13. Location Map of Balanga . Roundabout

On the map, if clicked it will display a 360-degree photo of the view of the Balanga Roundabout as shown in Figure 14 below.

Fig 14. Panoramic Photos of Balanga Roundabout

Second, the Augmented Reality feature that can be accessed through the Snapchat application. Augmented Reality is created by processing a 360-degree photo of the Balanga Roundabout which was taken using a 360 Camera. Then the photo is made in the form of a portal. The portal is processed using the lens studio application by adding objects that are designed in 3 dimensions. After the 360-degree portal is formed, it will produce Augmented Reality which is then published through the snapchat application. The Publish project generates a QR Code that is designed first. The QR Code of Balanga Roundabout is shown as Fig 15.

Fig 15. QR Code Bundaran Balanga

A 360-degree photo of the Balanga Roundabout is input into a project made on a studio lens. The project structure includes Materials, Meshes, Scripts, Textures. There are several objects that are inserted into the textures as shown in Fig 16 and Fig 17 below.

Fig 16. Icon Textures on the Balanga Roundabout Project

Fig 17. Pictures Textures on the Balanga Roundabout Project

Images and icons are included in the 360-degree portal project template and produce a display as shown in Figure 18 below.
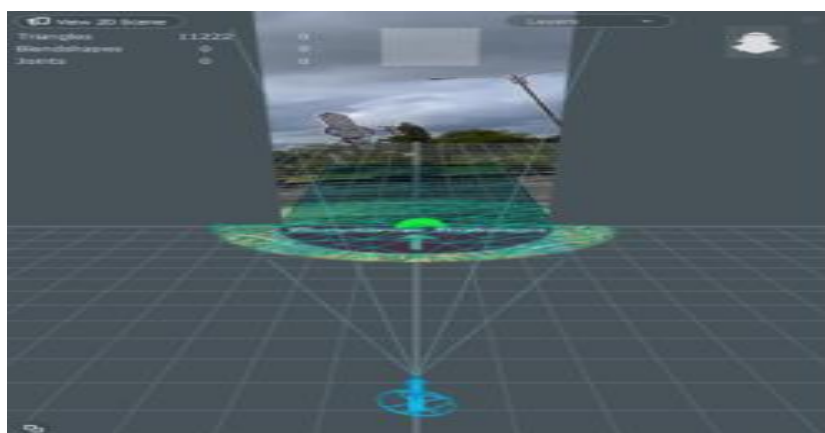

Fig 18. Portal Project Bundaran Balanga

All of these materials will produce an Augmented reality display as shown in Figure 19 below:
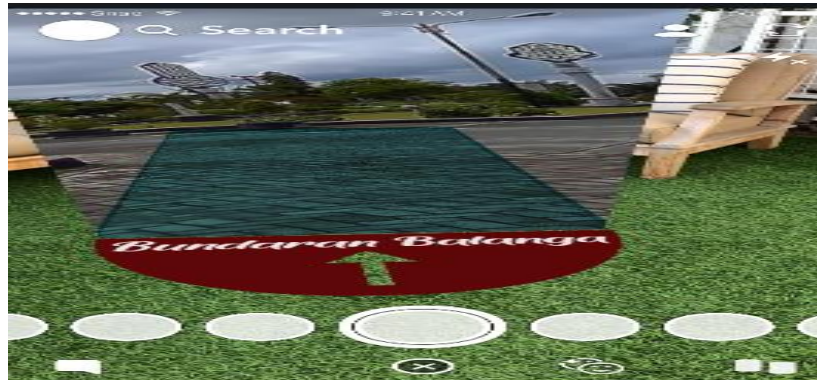

Fig 19. Preview Results Portal 360 Degree Augmented Reality

Based on several similar studies regarding the use of Augmented Reality as a tool to support tourism publications, culture, historical education and others in various regions in Indonesia, information can be obtained that Augmented Reality is more interactive and interesting. Among them are research conducted by Prita Haryani that utilizes Augmented Reality as an interactive technology in cultural heritage objects [10]. Research conducted by Budi Arifitama and Ade Syahputra also utilizes Augmented Reality technology to introduce historical sites in the Old Banten Region [5]. Similar research was also conducted by Harun Mukhtar who introduced historical sites in Pekanbaru City with Android-based Augmented Reality markerless [11]. Likewise with the research conducted by Edson Yahuda Putra et al who used 360-degree panoramic photos as an interactive medium for the City of Tomohon [12]. Research conducted by Xenna Rambing et al also uses the 30-degree panoramic feature to create an attraction for the Minahasa Traditional Dances[6].

The above studies have something in common, namely using Augmented Reality as a promotional medium for a tourist attraction or the history of an area. However, tourism publications in previous studies have not used Augmented Reality Portal 360 Degrees and the advantages of this research other than the information that can be obtained by users, the experience as if being in a location with Augmented Reality is the main attraction. And research on the history of Sampit is still very little. The history and culture that is owned should be a potential that can be developed and published because it is a characteristic that other regions cannot. With this research, it helps to publish the history that many people don't know and promote the tourism potential in it.

Based on the results of the application test, there were several weaknesses in the concept of this application, especially the Augmented Reality feature which was separate from the android application, which made it difficult for users to use the snapchat application again in addition to the application. The test results for the Explore Balanga Roundabout Application are good because they are able to provide the information users need and are displayed very clearly.

4. Conclusion

The Balanga roundabout is a tourist asset that has historical and cultural value for the people of Sampit. Utilization of technology is used to support the publication of historical information and stories so that they do not become extinct and are known by more people even outside the Sampit area. This research resulted in two uses of technology, namely:
a. An android-based Balangan Roundabout Tourism application that can be accessed by installing this application on an android device.
b. The Augmented Reality feature that can be accessed by scanning the QR Code, whether it's in the East Kotawaringin Tour book or the Balanga Roundabout Tourism Application. which is more user friendly. With this research, it will be a reference for further research for the development of Sampit History with more complete and interesting features and information.

5.   References

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