Design And Build Virtual Reality Photography Web-Based To Support Tourism

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Abstract— **Tourism is the activity of visiting tourist objects for recreational and leisure purposes. Along with developments in the world of technology and information, there is a technology that can be used to promote a tourist attraction called Virtual Reality. Virtual Reality is a technology designed to allow users to interact with a computer-simulated environment. The problem is that there are still very few travel websites that provide this feature. Virtual Reality technology in the world of photography is known as Virtual Reality Photography. Virtual Reality Photography can produce images in 360º, so people can see the image as a whole and as if they were in place when the photographer was taking pictures. The purpose of this research is to design and build a website that provides information for tourists who want to visit tourist objects. The development method used is the Multimedia Development Life Cycle. The output of his research is a Virtual Reality Photography website that provides information in the form of 360º images equipped with location maps and static images. Augmented Reality technology can be applied on this website as a form of information presented as well as Virtual Reality technology.**

Keywords— *Information, Multimedia, Tourism, Virtual Reality, Web.*

I. INTRODUCTION

Tourism is various types of tourism activities that are supported by various facilities and services provided by the community, businessmen, central government, and local governments [1]. In Indonesia, the number of foreign tourist arrivals in August 2018 rose 8.44 percent compared to the number of visits in August 2017, from 1.39 million visits to 1.51 million visits, of which Garut Regency received 4,983 foreign tourists visits [2]. This shows that foreign tourists are still enthusiastic about making Indonesia their tourist destination. Especially for Garut Regency itself, with that many foreign tourists, it will automatically increase regional income which can be used to improve the welfare of its people. However, information about the location of tourist attractions in Garut for tourists who want to visit has not been collected as a whole, so that location information is a basic need for tourists. The problem faced in the Tourism Industry is the format for presenting information that is only presented in the form of text and images and has not touched the realm of Virtual Reality. This technology can be used as a medium to promote tourist attractions, the world of education, public facilities, and the like [3]. To overcome these problems, this study aims to design and build a Virtual Reality Photography website that can display the location of tourist objects in the form of 360º images, so that they can assist tourists in getting information about the locations of tourist attractions to be visited.There are several studies at the Garut College of Technology that have discussed the provision of information, where the research puts forward technology to overcome the problem of providing information. The baseline and research gaps are presented in the form of a Research Roadmap as shown in Table 1.

TABLE I. RESEARCH ROADMAP

State	Writer	Year	Platforms	Information Format		
				Location	Profile	Content
Baseline	Hakim & Cahyana	2015	Web	Map	Text and Images	Map and Text Combined in One Menu
	Saepulloh & Cahyana	2015	Web	Text	Text and Images	Images and Text in One Menu
	Wildaanti, Tresnawati & Setiawan	2017	Web	Map	Text and Images	Maps, Text and Images In Optional Menu
gap		2019	Web	Map	Text, Image and VR	Text, Map, Image and VR In Optional Menu

Overall, the research is in the form of software applications that can provide information, both in the form of location maps [4], pictures [5], and some are combining images and location maps [6]. The three studies have not utilized Virtual Reality Photography technology. Two studies outside the Garut College of Technology discuss Virtual Tour of sports locations [7] and Virtual Tour of tourist attractions [8], both of which use Multimedia Development Life Cycle in their software development methods. This study aims to design and build a Virtual Reality Photography website that presents information in the form of images of tourist objects in the form of 360o images, location information in the form of Google Maps, and supporting information in the form of text and static images. Then the research question posed is what information will be presented by this website? and can other technologies such as Augmented Reality (AR) be applied to this website?

II. METHOD

This research development method uses the Multimedia Development Life Cycle (MDLC) [9], which has six stages of multimedia development, namely Concept, Design, Material Collection, Assembly, Testing, and Distribution. This research is limited to the testing stage. Testing stages include Alpha Testing with the Black Box method and Beta Testing. Alpha testing is a test by the developer of the application that has been built, while Beta Testing is a test carried out in the field objectively involving the end-user of the application project and aims to find out the shortcomings or problems faced by the user in the application [10]. The questionnaire uses the WebQual 4.0 measurement which is a method of measuring quality based on end-user perceptions where the questionnaire questions pay attention to the Usability variable [11]. Question responses are made in a

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negative question response format using a Likert scale where the highest score is 5 and the lowest is 1. The formula for calculating the results of the questionnaire is using the formula:

$$\text{Index \%} = \frac{\text{(Total Score)}}{\text{(Highest Score)}} * 100 \qquad (1)$$

The schema of the website design framework is described in the form of a Work Breakdown Structure (WBS) where this WBS is used to divide each work process into more detail so that the research process is more controlled [12]. The WBS follows the MDLC stages and is presented in the form of images as shown in Figure 1.
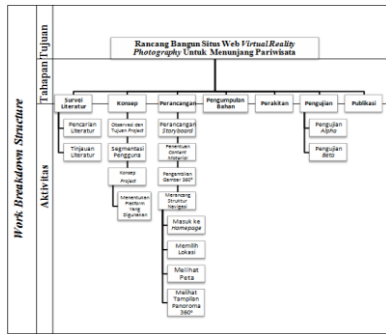

Fig 1. Work Breakdown Structure

III. RESULT AND DISCUSSION

A. Research Result

This research resulted in a website web Virtual Reality Photography as an information provider for tourists. In summary, the results of each stage are as follows:

1) Concept Stage generates a concept from a multimedia application project and is presented in the form of a table which includes title, users, features, interactivity, and the platform used;

2) The Design Phase produces a storyboard design consisting of 16 scenes and a navigation structure design;

3) Materials Collection Phase generates a list of collected materials that will be used at the assembly stage;

4) Assembly stage, producing a tourist website equipped with an information presentation in the form of Virtual Reality Photography equipped with static images and location maps;

5) The testing phase, generates site testing web using testing techniques alpha and beta with a percentage value of 91%, which means very good.

B. Results Discussion

This study adds a VR feature to the tourism information medium as shown in Figure 2. This feature will provide information about the details of the tourist locations that tourists will go to.

Fig 2. Attraction VR View

The answer to the first research question is that this website displays 1) information in the form of pictures of tourist objects in the form of Virtual Reality Photography; 2) information on the location of tourist objects in the form of Google Maps maps; and 3) supporting information presented in the form of text and static images. The three pieces of information presented on this website are based on the trend of VR technology development which has spread to various industrial fields including the Tourism Industry [13]. The availability of these three pieces of information can help tourists in knowing the destination of the tour as well as pictures of the location to be addressed [14]. Present information on the site web that is in the wake as shown in Figure 3.
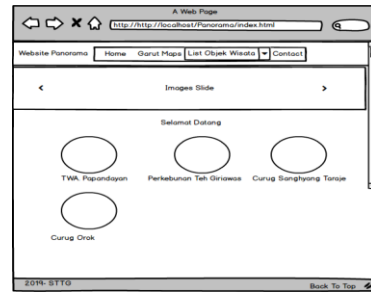

Fig 3. Display Website

AR has the same position, which is to function as a feature of presenting information in 3D. Regarding the benefits of research, the output of this research in the form of a website can provide positive benefits for tourists in terms of providing information. This is supported by data from a questionnaire on assessment of the sites web Virtual Reality Photography were distributed to 10 testers from different backgrounds work fields. Selection of sites tester web random because later on the site is the web this will be accessible to people from all walks of life so that in this way is considered appropriate. The questionnaires are presented in tabular form as shown in Table 2.

TABLE II. QUESTIONNAIRE RESULTS

No	Question	Evaluation				
		SA	A	N	D	SD
1	Display site layout *web*	6	4			
2	Menu placement	6	4			
3	Users can easily get the data they are looking for	6	3	1		
4	Presentation of data in the *website* meets the needs of users	5	5			
5	Ease of use of the *website*	5	4	1		
6	Available navigation	6	3	1		
7	The suitability of the site name *web* to function	6	3	1		
8	Available information	9	1			
9	Image provided	8	1			1
10	360 . VR Viewing Quality	6	3			1
	Amount	**63**	**31**	**4**		**2**

Note:

SA = Strongly Agree
A   = Agree
N   = Neutral
D   = Disagree
SD = Strongly Disagree

The results of the questionnaire obtained the following values:

Total Score = (Total Voters x Value)

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$= (63 \times 5) + (31 \times 4) + (4 \times 3) + (2 \times 2) + (0 \times 1)$

$= 315 + 124 + 12 + 4 + 0$

$= 455$

Highest Score = (Highest Score x Number of Questions x Number of Examiners)

$= 5 \times 10 \times 10 = 500$

Final Result $= 455/500 \times 100\% = 91\%$

This research is beneficial for the Tourism Industry. Results are shown through a questionnaire site testing web that shows the value of 91% of the value is very good. Then the success of this research in filling the problem space is shown by the addition of the Virtual Reality Photography feature where previous research has not touched this feature and only displays tourist profile information in the form of text and images. This study succeeded in presenting tourist profile information in the form of text, images, and VR. The success can be seen in the form of images as shown in Figure 4.
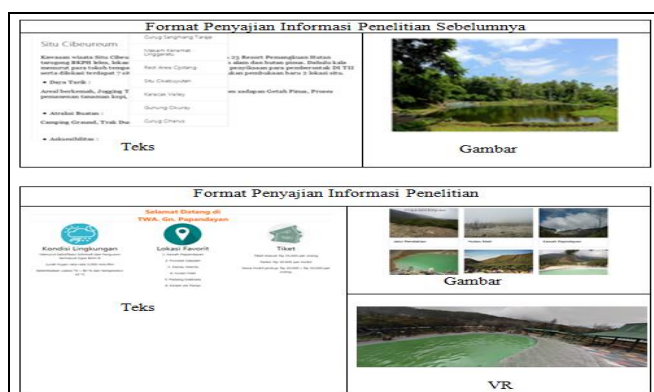

Fig 4. Comparison of Previous Research

IV. CONCLUSION AND SUGGESTION

A. Conclusion

Conclusion Research on information provider websites presented in the form of Virtual Reality Photography is as follows :

1) This research succeeded in designing and building a website as a tourist information provider with Virtual Reality Photography features ;

2) Through site- web Virtual Reality Photography is a problem concerning the features of the information provider can be resolved;

3) The information presented is in the form of Virtual Reality Photography equipped with location maps, text and static images as well as AR (Augmented Reality) technology that can be applied on this website, where its position is the same as Virtual Reality Photography as a tourist information provider feature**.**

B. Suggestion

Several things become suggestions for the development of this website in the future, namely:

1) The addition of Augmented Reality (AR) features on the website so that the information presented will be more interesting;

2) This study takes pictures using the facilities from the mappio.app website, because it does not have a tool in the form of a 360° camera so that in the future a 360 o camera needs to be owned so that it can freely exploit images from tourist objects that are not widely known to the general public.

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