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Design of the Cikolelet Tourism Village Virtual Reality Tour Application to Respons the Challenges of the 4.0 Tourism Era

DESIGN APLIKASI VIRTUAL REALITY TOUR DESA WISATA CIKOLELET UNTUK MENJAWAB TANTANGAN ERA PARIWISATA 4.0

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Abstrak

Pandemi Covid-19 mengakibatkan terjadinya penurunan di sektor pariwisata karena adanya pembatasan menyebabkan masyarakat tidak dapat ke tempat wisata, sehingga terjadi penurunan pengunjung yang sangat signifikan. Desa Wisata Cikolelet adalah desa wisata yang mengalami penurunan wisatawan akibat pandemic Covid-19. Desa ini memiliki potensi wisata alam perbukitan dan budaya kreatif yang menonjolkan lokalitas masyarakat baik dari produk lokal maupun aktivitas kesenian dan kebudayaan dari kehidupan sehari-hari masyarakat lokal. Penelitian ini bertujuan untuk menghasilkan rancangan aplikasi VR Tour Desa Cikolelet yang dapat mengakomodir kegiatan pariwisata di Desa Cikolelet sehingga wisatawan tetap dapat berwisata kapanpun dan dalam kondisi apapun secara virtual, sehingga diharapkan dapat membangkitkan kembali sektor pariwisata di Desa Cikolelet agar pulih lebih cepat melalui wisata virtual ini. Aplikasi ini dibangun dengan menggunakan metode agile VR di mana tahapan pengembangan dimulai dari *requirement, design, development, testing, deployment* dan *review*. Berdasarkan hasil hasil pengujian didapatkan 93% user merasa terbantu dengan kehadiran aplikasi VR Tour ini sehingga dapat disimpulkan bahwa penelitian ini menjawab permasalah yang ada. Penelitian ini memiliki batasan ruang lingkup pada proses desain Aplikasi Virtual Reality Tour yang diujikan dan digunakan di Desa Wisata Cikolelet. Untuk selanjutnya, aplikasi VR ini dapat digunakan dan menjadi alternatif cara berwisata baru secara virtual untuk mengakses beberapa atraksi wisata yang ada di Desa Cikolelet yang dapat dikunjungi oleh wisatawan yang ada di manapun dan dapat dikunjungi kapanpun secara virtual.

Kata kunci: Desain; *Virtual Reality*; Wisata,Aplikasi; Era Pariwisata 4.0

Abstract

The Covid-19 pandemic resulted in a decline in the tourism sector. The existence of physical distancing causes the community to traveling to tourist spots, resulting in a very significant decrease in tourists. Cikolelet village is a tourism villages which has a significant decrease of tourists due to the Covid-19 pandemic. This village has attractive nature tourism and creative cultural tourism from local products and from identity and cultural activities that exist in the daily lives of the local community. This research aims to design Cikolelet Virtual Tour Application which can accommodate tourism activities in Cikolelet Tourist Village, so that Cikolelet Virtual Reality Tour can revive back

tourism sector and it can recover fast and respons the challenges of the 4.0 tourism era. This application is designed by using virtual reality agile method whereas development step is started from requirement, design, development, testing, deployment and review. Based on the result of the user testing, the result is 86% user very agree that Cikolelet virtual tour can be a helpful for them to promote and upgrade the tourism sector in this village. So, in summarize it can be concluded that Cikolelet virtual tour can be implemented and resolve the problem in Cikolelet Tourist Village. The limitation scope of this research is about design process of Virtual Reality Tour Application which is tested and used in Cikolelet Tourist Village. For the future, this virtual reality tour application can be implemented and become new tourist method as virtual tour which is used to access some of tourist attractions in Cikolelet Tourist Village and it can be visited by tourists wherever and whenever as virtually

Keywords: *Design; Virtual Reality; Tour; Application; 4.0 Tourism Era*

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1 INTRODUCTION

Currently, we are in the 4.0 indutrial era and ready to go to 5.0 society era. Industrial revolution 4.0 has brought big changes in every parts of life, including tourism sector (Bilotta, Bertacchini, Gabriele, Giglio, Pantano, & Romita, 2021. One of industrial revolution 4.0 characteristis is about proliferation of cyber-physical systems, smart factories, and service innovations (Osei, Ragavan, Kandappan, & Mensah, 2020). Now, Information Technology is developing rapidly with marked by Internet of Things Technology. Virtual Reality (VR) Technology is one of technology which is very popular. VR is defined as interactive computer-aided simulated settings of reality (Riemann, Kreß, Roth, Klipfel, Metternich, & Grell, 2020). VR is often defined as a technology that uses a 3D computer-generated environment called a "virtual environment." A real-time simulation of one or more of the user's senses is often the result of navigating this virtual environment and interaction with it (Pestek & Sarvan, 2020). By using VR Technology, we can discover virtual world with real experience. Covid-19 Pandemic which has been going since 2020 until the end of 2022 start decrease gradually and it changes people pattern of life (Zeng, Liu, & Xu, 2022). When the pandemic occurred, tourism sector was a sector which got the impact. The Government Policy which denied people and society to do activity or gathering made tourism sector stop operating. In the post Covid-19 pandemic, tourism sector starts to rise and there are much of prospects are created, especially with space to virtual tourism (Godovykh, Baker, & Fyall, 2022). VR can be used to plan and manage tourism, Marketing and Information Exchange, Entertainment, Education, Accessibility and Heritage Maintenance (Zeng, Liu, & Xu, 2022). Research about VR from year to year also do continually, but there are still many gaps which can be used to do research which this theme (Muñoz-Saavedra, Miró-Amarante, & Domínguez-Morales, 2020). It is based on the widespread of using of VR in various activities carried out. Therefore, VR developing which is increasing and emergence of metaverse make research about VR still become interesting topics which is worth to do.

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2 LITERATURE REVIEW

Virtual reality is a computer-generated simulation of another world or reality, mostly used in 3D movies and computer games (Yadav, 2022). At the moment, VR usually is used to play the game or simulation. During the past pandemic, VR was well- known by people and almost all sectors used VR to help their activities. Almost all fields use VR technology to help their activities. For example in education sector, medical faculty use VR to help their students to do surgery practices, so that students do not have to come to campus.Then, on the automotive sector, VR is used to test drive simulation for the customer candidate who will buy a car. On the other hand, on the business sectors, many companies which use VR to help them to promote and to sell their products. Since its appearance, VR has been utilized in various fields, as far as games are concerned (Zyda, 2005), training in military sector (Cipresso, Giglioli, Raya, & Riva, 2018), Architecture and Design (Song, Chen, Peng, Zhang, & Gu, 2018), Education Sector (Englund, Olofsson, & Price, 2017), Training Emotional and Social Skills in Children with Autism Spectrum Disorder (Yuan & Ip, 2018), and Simulation in surgery procedure and practices at the hospital (Gallagher et al., 2005).

Now, VR Technology is used by tourism sector to attract tourist interest to visit the certain tourism destination. In Tourism Era 4.0, contribution of information technology is needed absolutely. The role of Information Technology in the tourism sector can be started from hospitality industry which is one of supporting system in tourism. Application of technology in hospitality is started with application of networking technology to hotel room booking, and now hotel room booking can be booked online and the hotel guest can give the review about the hotel which is booked by them by using current hotel booking application. This things often called by Smart hospitality. Smart hospitality is envisioned as an interoperable, connected system that enables information sharing and adds value to the entire ecosystem of stakeholders through digital platforms (Ben Youssef & Zeqiri, 2022). Smart Hospitality is one of manifestation of tourism 4.0 which is current being discussed. "Hospitality Revolution 4.0" is theorized by researchers as "a blend of leading IR 4.0 technologies and their visions for the hospitality and tourism industry; For successful integration and implementation into the hospitality ecosystem" (Osei, Ragavan, Kandappan, & Mensah, 2020).

Based on the research which was done by the researcher in the past, it can be concluded that the application of Information Technology in tourism sectors is something that can not be separated, because with this information technology, the tourism sector can develop rapidly (Rusdi, 2019). The presence of Information Technology is an important things and it can not be avoided and rejected in Tourism 4.0 Era because the presence digital

technology is absolutely things in the era of industry 4.0(Rizkinaswara, 2019).Then, using of Virtual Reality technology becomes one of technology which is used in tourism sectors. The purpose of this application is to increase tourist visiting, because by using VR technology, tourists can get virtual experience. When they visit tourist destination by using VR Technology, they will visit to real tourist destination in the virtual room(Hartini, Anglelyn, & Sukaris, 2020).

Climate change is one of interesting thing which also become concern for us. We often experience very high rain fall and heat at this time (Ben Youssef & Zeqiri, 2022). This climate change has been experienced together and the the impact of climate change is so powerful and marked with the decreasing of land area because the increasing of sea water level (Roson & Van der Mensbrugghe, 2012). Indirectly, tourism sector becomes the biggest contributor in the climate change, because the tourism sector is an industrial sector which involve many things. It starts from restaurant hotel, arline, transportation, and tourism destination (Ahn, Lee, Back, & Schmitt, 2019). Much of research in the past which debated about the impact of tourism sector to climate change (Hoogendoorn & Fitchett, 2018). The most important thing which become our concern is about a research that state tourism sector is one of sector which have a contribution to increase carbon emission in the world (Adedoyin & Bekun, 2020). Tourism sector contribute 5% from global carbon emission which is caused by 75% from transportation, 21% from accommodation, and 4% for another tourist activities (Challenges, G., 2008). Based on many problems in above, Information Technology, especially VR can be hope to resolve the problem about climate change. It because by VR Technology, tourists can feel real experience on the way until arrive to tourism destination by virtual experience which available in VR, so that it can increase the efficiency of tourists tour.

3 RESEARCH METHOD

Making of Virtual Reality Tour application was done to increase tourists visiting in Cikolelet Tourism Village. Cikolelet Tourism Village is one of village which is located in Cinangka Sub-District, Serang Regency, Banten Province. This village became the winner of Favourite Tourism Village and Stub of Tourism Village in the event of Anugerah Desa Wisata Indonesia (ADWI) which was held by Ministry of Tourism and Creative Economy in 2021 (Alamsyah, 2021). There are some of potential natural tourism destination and traditional culture tourism destination which is still continue to be preserved (Negara et al., 2022). Some of tourism destination in Cikolelet Tourist Village such as Curug Lawang, Curug Kembar, Puncak Cibaja, and the other destination (Suprina, Rachman, & Fitriana, 2019). This VR Application is made by using Agile method. Agile software development is an adaptability-oriented approach to software production and can be understood as the ability of processes to respond to changes in markets, requirements, technologies, and development teams (Mattioli, Caetano, Cardoso, & Lamounier, 2015). Agile development methodologies and the

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use of VR technology are becoming increasingly important for today's manufacturing companies (Freitag, Westner, Schiller, Nunez, Gigante, & Berbegal, 2018). The stages of Agile methodology can be seen at Figure 1 as follow as:

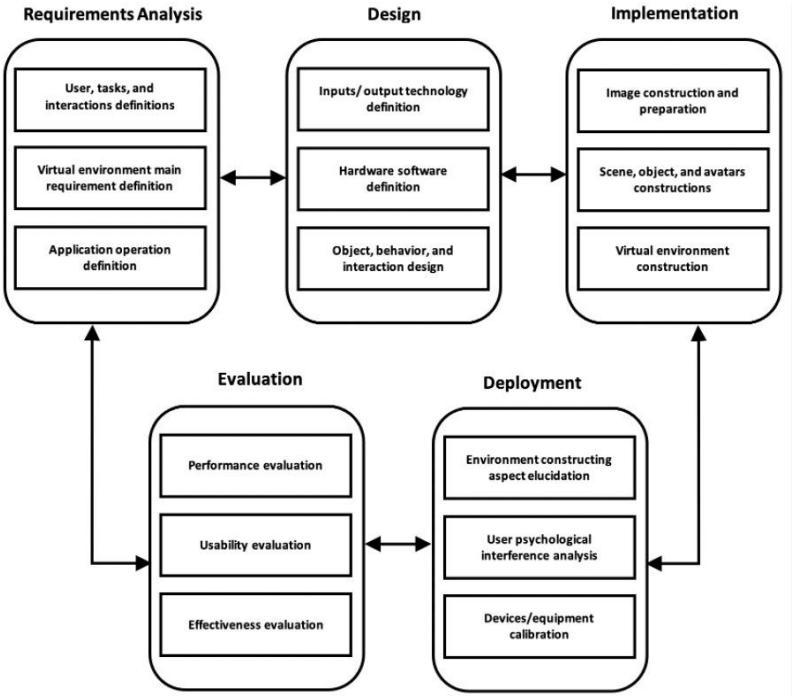

FIGURE 1. HYBRID COMPOSITE

First Stage was Requirement Analysis. This stage was used to know user needs. Authors did interview and observation methods to correlate user needs and application which would be made. Based on the interview results, it could be concluded that Cikolelet Village need this VR application to increase the number of tourist vacation.

Second stage was Design. This stage was done by identified what hardware and software which would be used and identified what objects that would be used in the application development process. The hardware and software which would be used in the application development could be seen in the Table 2 . Then the Hardware dan software viewer could be seen in the Table 3, and identified objects that would be used in VR application could be seen in Table 1 bellow.

TABLE 1. MILLEALAB HARDWARE AND SOFTWARE CREATOR

Types of device	Specifications
Computer or Laptop	OS: Win 8- 64 GB
	Processor: i3 5th atau AMD Athlon II X4 640 or above
	RAM: 2GB
	Free space: 2GB Free Space
	Graphic : 1 GB vram
	Internet Connection minimal Speed 500 kbps

Types of device	Specifications
Android Smartphone	OS: Android - Minimal Lollipop
	Processor: Hexa-Core 4 x 1.4 Ghz yang setara atau diatasnya
	RAM: Minimal 3GB
	Free space: 500 Mb
	Graphic Card: Adreno 510 equivalent or above
	Sensor: Gyroscope sensor, Accelerometer Sensor

Source: Milealab. (n.d.).

TABLE 2. OBJECTS OF STORYBOARD

Objects	Objects Information
Object 1	Main road of Desa Cikolelet
Object 2	Tugu Pendopo
Object 3	Rumah Gubuk
Object 4	Portal Scene
Object 5	Local road of Cikolelet Village
Object 6	Rumah Pondok
Object 7	Mosque
Object 8	Garage

Third stage was about implementation. This stage concerned about asset creation based in Table 3., application flow planning and objects which needed in the VR application and displayed on Story Board. Asset creation was displayed on Figure 2 and Figure 3.

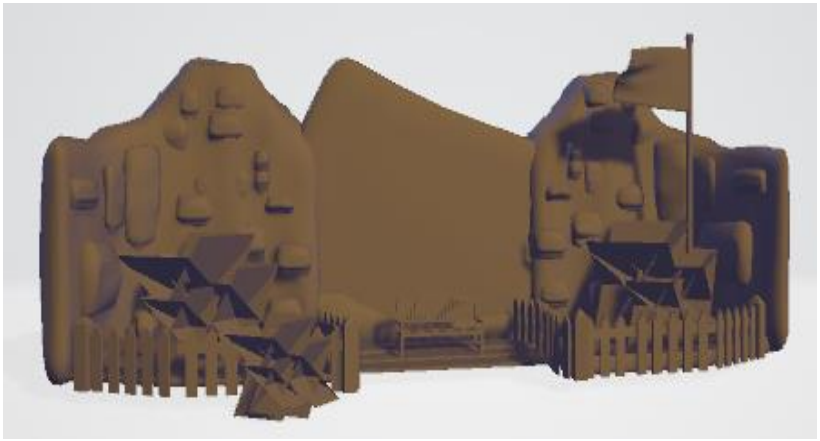

FIGURE 2. 3D ASSET OF CIKOLELET WELCOMING MONUMENT

FIGURE 3. 3D ASSET OF PUNCAK CIBAJA

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Storyboard had important contribution in development process of multimedia application, especially VR Application (Mahardika & Destiana, 2014).

TABLE 3. VR APPLICATION STORYBOARD

No	Position	Concept	Assets		Interaction		
			Envi	Animated O	Popup Info	Voice	Custome Image
1	Opening	The player is a tourist who wants to travel to the Cikolelet tourist village, he is in front of the welcome monument.	Main Road of Cikolelet Village, Tugu, Desa, Pendopo (Imah Awi)	Tourists and Pokdarwis	Opening Speech from Cikolelet Village	Additional Voice Over Welcome to Cikolelet Village	
2	Problem	Tourists do not know the location of tourist attractions in Cikolelet village, so they ask a Pokdarwis	Main Road of Cikolelet Village, Tugu, Desa, Pendopo (Imah Awi)	Tourists and Pokdarwis	Information about Cikolelet Tourism Destination Variation	Additional Voice Over to Pokdarwis	Maps
3	Problem Solving	Pokdarwis directs players to visit tourist attractions in the Cikolelet tourist village	Main Road of Cikolelet Village, Rumah, Rumah Gubuk	Tourists and Pokdarwis	Dialogue between tourist and Pokdarwis	Additional Voice Over to Pokdarwis	Maps and tourism destination photos
4	Closing	Players successfully visited tourist attractions in the Cikolelet tourist village	Main Road of Cikolelet Village, Portal Scene (Portal 2), Second Road of Cikolelet Village, Rumah Pondok	Tourists and Pokdarwis	Tourists get information from tourism destination pop up	Additional Voice Over in all tourism destination	Tourism destination photos

Fourth stage was about Deployment. This stage concerned about interface application design based on Storyboard. There were 4 scenes in VR Application as follows as: opening scene, problem scene, resolving scene, and closing scene. Visualization of opening menu could be seen in Figure 4-7, as follow as:

FIGURE 4. OPENING SCENE OF CIKOLELET VR

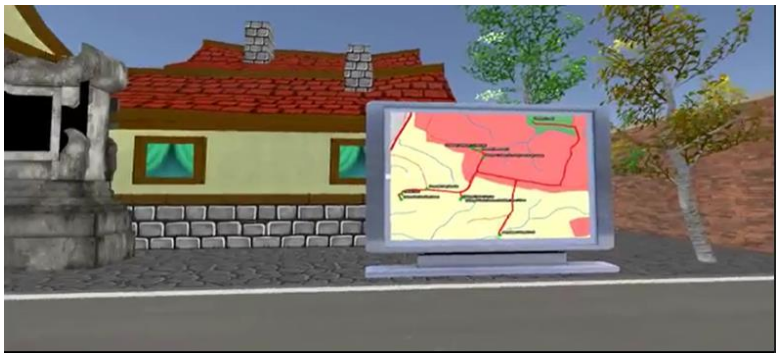

FIGURE 5. PROBLEM SCENE OF CIKOLELET VR

FIGURE 6. PROBLEM SOLVING SCENE OF CIKOLELET VR

FIGURE 7. CLOSING SCENE OF CIKOLELET VR

Last stage was about Evaluation. This stage was about application and user testing. The test was done to know user suitability. Tested was done with by user VR application tested directly. After that, user must filledthe questionnaire as respondent. The results could be seen on the Table 4, as follow as:

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TABLE 4. QUESTIONAIRE OF USER APPLICATION TESTING

No	Question	The Number of Respondent Answer				
		A	B	C	D	E
1	Did you know about a technology called Vitual Reality (VR) before?	4			2	1
2	Did you use VR, one times before?	6	1			
3	Do VR Technology very easy to use?	1	4	2		
4	What level of similarity has the VR made to the actual environment?	1	5	1		
5	Are the facilities in VR complete?		7			
6	Can the existence of VR Technology be beneficial to develop Cikolelet Village, especially in technology industry ?	7				
7	Can VR Technology be pontential to promote Cikolelet Village to the public and society?	7				

Based on the respondent answers, it could be resulted as percentage of scoring scale which could be seen on Table 5.

TABLE 5. THE PERCENTAGE OF RESPONDENT ANSWERS

Number of Question	Percentage of Answer (%)	Interpretation Score
1	71	Agree
2	97	Very Agree
3	77	Agree
4	80	Very Agree
5	80	Very Agree
6	100	Very Agree
7	100	Very Agree
Results	86	Very Agree

4 FINDINGS AND DISCUSSION

Based on the research analysis, it can be found as follows as:

1) Cikolelet Village needs VR Application to Cikolelet Village needs a VR application to generate recover tourism potential based on the result of dept interview and questionnaire which question "Can the existence of VR Technology be beneficial to develop Cikolelet Village, especially in technology industry?", seven (7) respondents “Very Agree”
2) VR Application can help to increase number of tourist vacation based on the results of the questionnaire testing which the question, “Can VR Technology be potential to promote Cikolelet Village to the public and society?”, seven (7) respondents “Very Agree”
3) VR Application can be implemented. It can be seen based on the results of questionnaire testing, whereas the average of the results of the test shows about 86% with the interpretation “Very Agree”

4) VR Application can be a solution to suppress climate change. It based on the research result that by using VR, tourists do not come to the tourist destination in the real time. Therefore, it will become efficient of the transportation using.

5 CONCLUSION

Based on the research, it can be concluded that Cikolelet Tourism Village had been decreased on the tourist visiting during the pandemic, therefore VR application is needed to promote the tourist destination which is located on Cikolelet Village. Hopefully, the number of tourist visiting will be increased significantly. Then, VR Application is suitable to be implemented and it can be seen from the the result of data processing that 86% respondent state that they are very agree to implement VR in Cikolelet Village. The research limitation which was done is the number of respondents was to less and the answer usually did not show the real answer. For the future, it must be improved by adding the number of respondent and use another testing method to improve the quality of application which was made. Then, another research limitation is the asset which is used still the Milealab asset, researcher was made the asset, but it failed on the uploading process in Milealab Creator because the asset did not fit with the Milealab standardization.

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Kutipan Artikel

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