DEVELOPMENT OF VIRTUAL TOUR APPLICATION AS A PROMOTION MEDIA OF GRIYA DAHAR IBU KADI REST AREA

Ahmad Wijayanto[1], Richi Dwi Agustia[2]

Teknik Informatika-Universitas Komputer Indonesia
Jl. Dipatiukur 112-114 Bandung
Email : ahmadwijayanto@gmail.com[1], richi@email.unikom.ac.id[2]

ABSTRACT

Griya Dahar's Resting Place Ibu Kadi is a place for resting that is right for transit to enjoy the facilities there. Griya Dahar's Resting Place Ibu Kadi provides restaurants, halls, cafes and motorbike showrooms. Based on interviews with Griya Dahar Ibu Kadi Rest Area Owner, who was associated with the promotion used by the Griya Dahar Rest Area, Ibu Kadi was only through close relationships and social media. The stage of data collection carried out in this study is by using the interview method, literature study, questionnaire, and observation. The application that is built is a virtual tour application using the stitching method while the process is used gradually from the start of photo collection, stitching process, then becomes a 360 image and sets a hotspot. The testing process is carried out by conducting interviews with consumers of the Dahar Rest Area Griya, Kadi. Based on the results of testing, with the presence of this virtual tour application, it can be used as an interactive promotional media for owners and also to provide customers with information such as facilities, menus, and prices provided at the Griya Dahar Rest Area, Ibu Kadi.

Keyword: Griya Dahar Rest Area, Ibu Kadi, Media Promotion, 360 Degrees, Interactive, Virtual Tour

1. INTRODUCTION

1.1 Background

Griya Dahar Rest Area, Ny. Kadi started in 1990 with the founder of Mr. M. Soekadi. Griya Dahar's Rest Location, Ibu Cadi, is 1500 meters from the exit of the Pasteur toll gate and is in an area of 4950 square meters. With a strategic location near the Pasteur toll gate, Griya Dahar Rest Area, Ibu Kadi is the right place for resting places to enjoy the facilities there. Ms. Griya Dahar's Resting Place Kadi provides restaurant facilities with saung lesehan with a total capacity of 50 people and a dining table with chairs with a total capacity of 72 people. In addition, other facilities such as the hall can be used for training, meetings, weddings. With a seating capacity of around 75 people, if for a wedding party the capacity can reach 150 people. Other facilities are cafe, motorcycle showroom, coffee & tea and other public facilities.

Based on an oral interview with the owner of Dahar's Griya Rest Area, Kadi Bambang Soeprijadi, for now there are a number of problems caused by the promotion used by Dahar's Rest Area Griya, namely only through coworkers and social media. This tool provides little information to consumers about menus and facilities, only with photos and writing, this is less effective because consumers do not know the facilities available directly there, based on the results of interviews with visitors to the Dahar Griya Rest area of Ibu Kadi and concluded from the second statement on the questionnaire that they agreed with the establishment of a virtual tour application to make it easier for visitors to know the environment and information available in the Dahar Griya Rest area of Ibu Kadi.

Interactive multimedia that will be built is a result of photographic results which will then be carried out photo stitching process with the panorama cube method, where the panorama cube method has advantages in image quality because of the cube shape which has six sides so that image placement can be done on each side. So the end result is a panoramic photo that is combined to form the Virtual Tour. Taking pictures to form a 360 image that is using a DSLR camera and a fish eye lens. The advantage of using a fish eye lens is taking pictures without doing the editing process so that only six photos are taken to form a cube panorama, in contrast to using a fix lens which must process photos of more than six photos and do editing to combine images and form a cube panoramic image. According to Rhandy Sarwatatwadhika (Rhandy, 2017) the application of virtual tour applications at Unikom can help students provide information and provide an overview of new buildings attractively. And according to Ade Yuliana (Ade, 2017), the virtual tour application is very suitable to be used as a promotional media for Stone Garden attractions because it can help local and foreign tourists to find out about the beauty of nature in a virtual tour-based tourist attraction. Based on the problems that have been explained, a virtual tour application will be built as a promotional medium in the Griya Dahar Rest Area, Ibu Kadi.

1.2 Identification of Problems

Based on the background above, the discussion examined in this study is the making of an application that can facilitate consumers to find out about facilities, menus and prices as well as interactive promotional media in the Griya Dahar Rest Area, Ny. Kadi.

1.3 Purpose and Objectives

Based on the problems that have been explained, the purpose of this final assignment is to build a virtual tour application as a promotional media in the Griya Dahar Rest Area, Ibu Kadi.

The goals to be achieved from the development of this virtual tour application are to:

1. As an interactive promotional media to facilitate consumers of the Dahar Rest Area Griya, Kadi.
2. Facilitate consumers to obtain information such as facilities through 360-degree panoramic images and also display the location, menu and prices found in Dahar's Griya Rest Area, Ibu Kadi.

1.4 Research Methodology

The research methodology used in this study has several stages including Requirement, Design, Implementation, Verification, Maintenance. Figure 1. explains how the description of research methods is carried out:
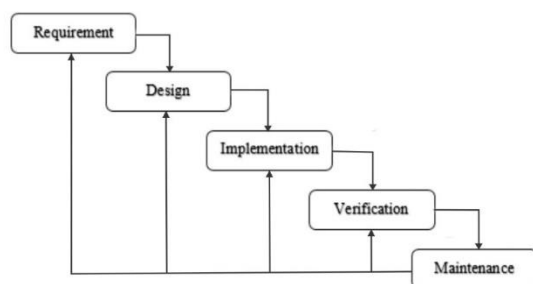
Picture 1. Waterfall Methode

In making this research the author uses the Waterfall method which consists of:

1. Requirement

Identify problems by collecting data, collecting journals, papers and readings related to the Virtual Tour. And conducted interviews with visitors at the Griya Dahar Rest Area, Mrs. Kadi.

2. Design

Make specifications about the user interface, program architecture and virtual tour relations.

3. Implementation

System design is done as a first step to build a new system. System design is divided into three analyzes, namely analysis of non-functional requirements, functional requirements analysis and system design analysis using a structural approach which will be explained below:

a. Analysis of non-functional requirements

analyze the resources needed, namely hardware, software and users.

b. Analysis of functional requirements

It is a process of drawing and planning or setting up of several separate elements into one whole unit.

4. Verification

At this stage testing will be carried out using blackbox and beta testing to check whether the generated virtual tour application can be run according to the results of previous analysis or not.

5. Maintenance

At this stage, if there is an error in the virtual tour system, maintenance is made to correct the errors found in the previous step.

2. RESEARCH CONTENT

2.1 Analysis of the Problem

Based on the problems described, the solution to this problem is to build a multimedia application that can introduce the Dahar Ibu Kadi Griya Rest Area environment to its consumers, where this application is an interactive application that simulates people's image of the rest area environment so that users can wearing it felt like I was in the rest area of Griya Dahar area, Mrs. Kadi. This application also runs on a web platform to streamline information dissemination.

2.2 Virtual Tour

In a journal compiled by Dianto G. Thomas, Sherwin R. U. A. Sompie, Brave A. Sugiarso Virtual Tour is a simulation result of the actual location, consisting of a sequence of videos or a collection of photos. The Virtual Tour can also use several other multimedia elements, such as sound effects, music, narration, and text. The phrase "virtual tour" is often used for various video and photography media. Panorama refers to uninterrupted views, because the panorama can consist of photographs or panning video recordings. However, "panoramic tours" and "virtual tours" of large scale have been approved with tours that have been made with statistical cameras or the latest now 360° cameras. Virtual Tour 360° is the result of digital photo processing that forms panoramic photos. The panoramic photo was then developed to create a Virtual Tour software that can be used to look up or down, rotate or use. [3]

2.3 Cube Mapping

Cube Mapping is a method that uses six sides of a cube as a basic form of mapping. Environmental images are projected onto six surface cubes and stored in the form of 6 different images from 6 viewpoints.

Cube Mapping is still the most widely used mapping method until now. Because in addition to covering the weaknesses in the Sphere Mapping such as limited viewing angles, image distortion and blind spots, Cube Mapping also provides an efficient solution to apply lighting and only requires 1 rendering (where the Sphere Mapping must render repeatedly when the point of view changes).

If Cube Mapping has drawbacks, it is when you need to add a new object or light source, you must render it again. Also must render again when the object moves through a certain area. [5]

2.4 Analysis of the System to be built
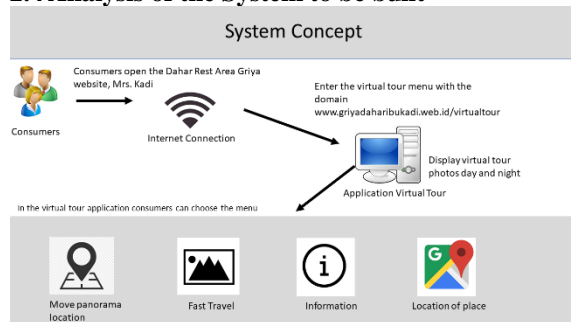
**Picture 2.** The Concept of the System to be Built

The system to be built is a Virtual Tour application using a web platform with Virtual Reality technology. The web platform was chosen because it has advantages, that is, it can be accessed easily with the browser making it easier for users to access the application. Virtual Reality technology is used because it has several advantages, it can display visual information that is better than other information so that it can be applied into the application and can be a solution to existing problems. The goal to be achieved from the design of this application is to be able to display information about the environment of the Dahar Ibu Kadi Griya Rest Area in an interactive and easy way to be easily used by the user. Virtual tour that will be built to facilitate consumers in knowing the facilities and information about the Dahar Griya Rest Area, Ibu Kadi.

2.5 Analysis of the Virtual Tour

The development of the Virtual Tour Application as a promotional medium in the Griya Dahar Rest Area, Ibu Kadi aims to help consumers recognize the environment and find out the information contained there. In this application allows users to observe place information indirectly by making real-world representations into virtual world forms by using panoramic photo images from real worlds projected into computer technology. To create a virtual tour the first step that needs to be done is to collect photo assets such as cameras and lenses needed and then create a panoramic photo, then the image is presented into a 360 degree image and added a hotspot as a node to navigate from one location to another.

2.6 System Architecture

The stages of system architecture are where steps are taken to get a general picture of the system to be built. Image of system architecture can be seen in Figure 3.
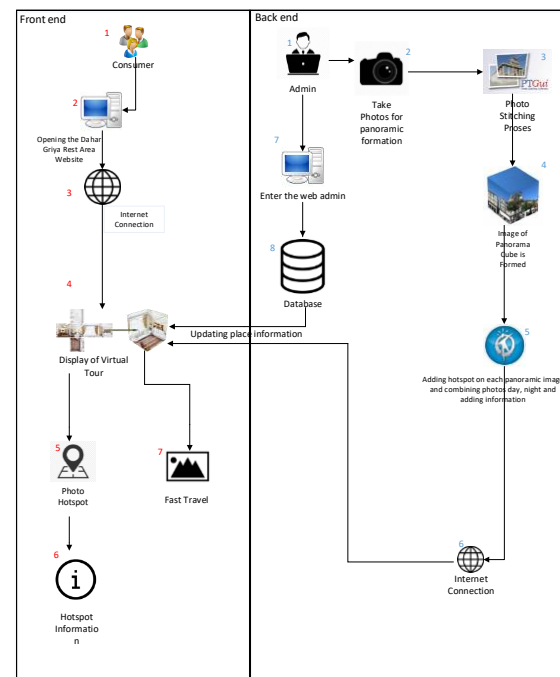
Picture 3. System architecture

2.7 Virtual Tour Analysis

Analysis of the description of the process of making a virtual tour application can be illustrated by grooves as shown in Figure 4.

Picture 4. The process of making a virtual tour application

To create a virtual tour the first step that needs to be done is to collect photo assets such as cameras and lenses needed and then create a panoramic photo, then the image is presented into a 360 degree image and added a hotspot as a node to navigate from one location to another.

Next is to collect assets. Before making a panoramic photo the first step is to collect assets first by preparing the camera and lens used to make panoramic photos. The lens used to make panoramic photos is a fisheye lens. Fisheye lenses have the advantage of taking a wider range of scenes compared to a regular fix lens. So that taking pictures to form a panorama does not need to take a lot of images with only six images for improvement in the viewpoint of the cube panorama and how to take pictures rotating sequentially from front, right, left, back, up and down.

2.8 Making a 360 degree image

In the process of making a 360 degree image the steps taken are by combining several photos into a panoramic photo the process is called Image Stitching. This process is a combination of two adjacent images and has the same part or view. Image

stitching requires a method to find out the equation points in the next image and image.

To do the stitching process, what must be done first must find out which parts of the photo have similarities. It is assumed that when the photos are taken, there are parts of the scene that are taken twice on taking consecutive photos. To find these parts, special algorithms are needed, one of which is key point matching. An example of the process of stitching photos is shown in Figure 5. :

Picture 5. Stitching process

2.9 Changing photos into panorama cubes

Panoramic photos that will be used in the construction of a virtual tour application at the Griya Dahar Rest Area Ibu Kadi is a cube panoramic photo, where the shooting technique can be taken by taking 6 pictures (front, right, left, back, up, down) and determining x points, y, z according to the provisions of the panorama cube it will produce as shown in figure 6.
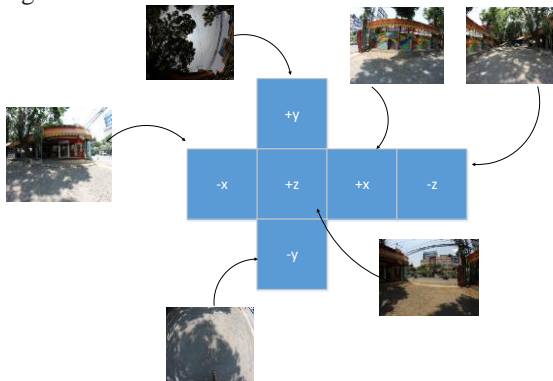
Picture 6. Formation of panoramic cube photos

2.10 Hotspot placements

The position of the hotspot placement is done on a 3dVista application different from the placement of a panoramic photo on the cube, the hotspot position is placed below with the arrow as shown in figure 7.
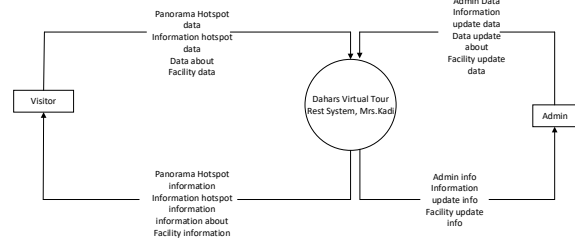

Picture 7. Hotspot placement process

2.11 Analysis of functional requirements

2.11.1 Context diagram

The following is the context diagram of the virtual application tour of the Dahar Ibu Kadi Rest Area Griya, can be seen in Figure 8.


Picture 8. Context diagram

2.11.2 Data Flow Diagrams

The following is DFD level 1 consisting of about, facilities, menus, panoramic players from the virtual application tour of Dahar's Ibu Kadi Rest Griya Area as shown in figure 9.
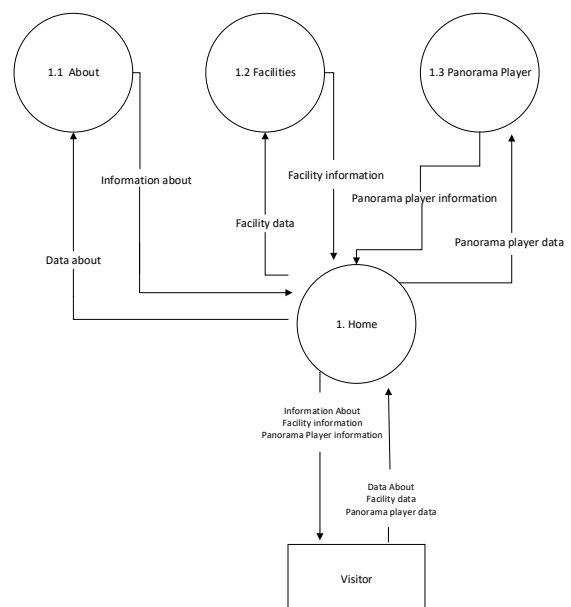
Picture 9. Data Flow Diagrams Level 1

DFD level 2 Panorama Player consists of sliding panoramas, Adjust panoramic distance, Hotspot access, Fast travel access as shown in figure 10.
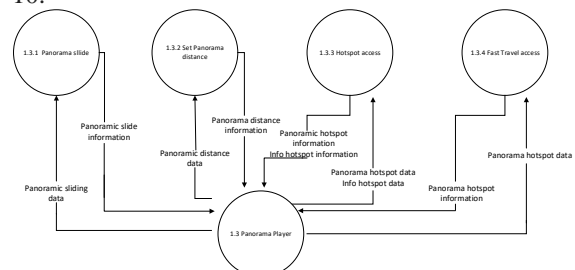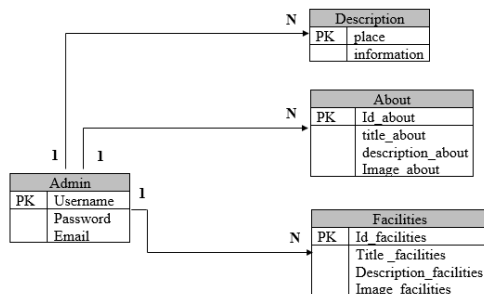

Picture 10. Data Flow Diagrams Level 2

2.12 System Design

System design aims to specify aspects that will be a solution in planning that is built.
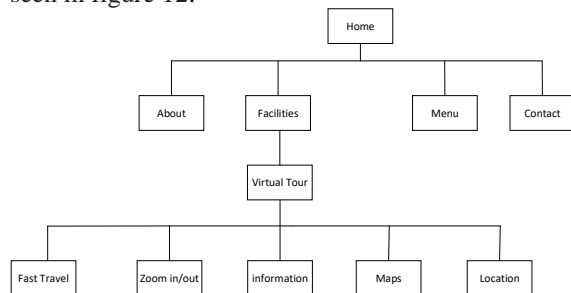
2.12.1 Relationship scheme

Scheme The relation between the development of the Virtual Tour application as a promotional medium in the Dahar Rest Area, Ibu Kadi is as follows:

Picture 11. Relationship scheme

2.12.2 Designing the menu structure

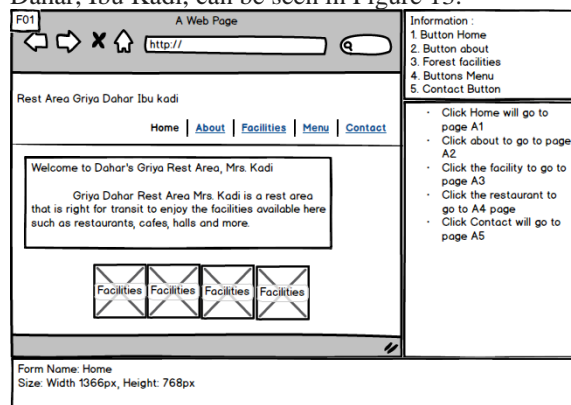The menu structure design from the virual tour application Rest Area Griya Dahar Ibu Kadi can be seen in figure 12.

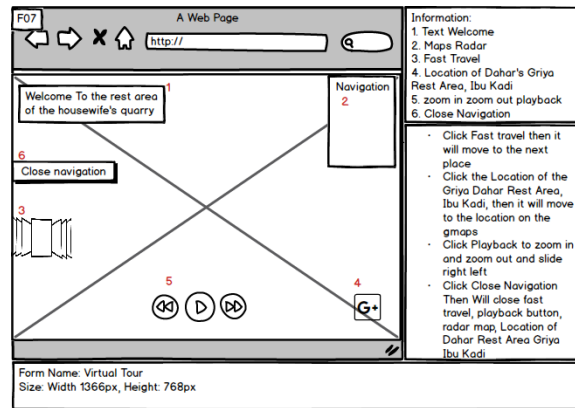**Picture 12.** Menu structure

2.12.3 Interface design

Designing the interface for the main page of the virtual application tour, the Rest Area Griya Dahar, Ibu Kadi, can be seen in Figure 13.

Picture 12. Main page interface

Designing a virtual page tour interface for virtual applications on the tour of Dahar's Ibu Kadi Rest Area Griya can be seen in Figure 13.

Picture 13. Virtual tour interface

2.13 *Black box* testing

Black box testing is a test that demonstrates the function of software that operates, by checking whether the input data can be received properly, and the output is in accordance with what is expected.

Table 1. Test Plans

Test Item	Detail Test	Type test
Login	Login verification	*Blackbox*
Admin	Account	*Blackbox*
	Edit description	*Blackbox*
Facilities	Virtual Tour	*Blackbox*
Web facility	Description update	*Blackbox*
About	Description update	*Blackbox*

2.14 System Testing

System testing is carried out with the aim to determine the extent of the quality of the software being built, whether it is in line with expectations or not. For this reason, this research was carried out by using an application, namely Gtmetrix to find out how fast the website access was carried out with 24 users who accessed Dahar's Ibu Kadi Rest Area Griya website and attached the results when the web was loading time of 2.4 seconds. Then the conclusion is that the score record is 84% in the average category.

3 CLOSING

3.1 Conclusion

Based on the results obtained in this thesis, conclusions can be drawn as follows:

1. With the existence of a virtual tour application as an interactive promotional media to facilitate consumers of the Griya Dahar Rest Area, Mrs. Kadi.
2. Makes it easy for consumers to obtain information such as facilities through a 360-degree panoramic image and also displays the location, menu and prices found in the Dahar Rest Area, Ibu Kadi.

3.1 Suggestion

Suggestions for developing virtual tour applications that can be done include:

1. Add reservation features to the virtual tour application to make it easier for consumers to book a place.

BIBLIOGRAPHY

[1] Samhis Setiawan. (2018, August) Definition of Promotion according to experts [Online]. https://www.gurupendidikan.co.id/promosi-pengertian-menurut-para-ahli-tujuan-fungsi/ [Accessed: November 14, 2018 20.15].

[2] Aznoora Osman., Development and Evaluation of an Interactive 360, Journal of Information Technology Impact, 2009.

[3] Dianto G. Et al. "Virtual Tour as an Interactive Media for Promotion of Lodging in the Bunaken Islands", Vol. 13 No.1 (2018) ISSN: 2301-8364

[4] Savanah (2015, November) Open Panorama [Online]. http://www.nongnu.org/openpanorama/documents/projections/ [Accessed: October 10, 2018]

[5] Yohan Angjaya, "Analysis of OpenGL-based Cube Mapping Techniques", A11.2006.02722

[6] Budhi Irawan., "Computer Network. Bandung ": Graha Ilmu, 2005

[7] Bertzzie. (2016, October) Javascript Development Philosophy [Online]. https://bertzzie.com/knowledge/javascript/Filsafat-Pengembangan-Javascript.html [Accessed: 10 October 2018]

[8] JSON. (2016, October) Introduction to JSON [Online] http://www.json.org/json-id.html [Accessed: 10 October 2018]

[9] Ramon A Mata Toledeo., Basics of a Relational Database. Jakarta: Airlangga, 2007

[10] Roger S Pressman Ph.D., "Software Engineering Practitioner Approach": Book One, 2002

[11] Arham, Zaid, Nelly Indriani, and Indonesian Computer Science Universities. "Development of Virtual Mirror Eyeglasses Using Augmented Reality Technology." Informatics Engineering Journal. Indonesian Computer University (2012).

[12] Nelly Indriani W & Arham, Zaid (2012). "Construction of Virtual Mirror Glasses Using Augmented Reality Technology". KOMPUTA, vol. I. 79-84. 2012