

# **DEVELOPMENT OF VIRTUAL TOUR APPLICATION AND RESERVATION IN AVIA RESIDENCE**

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## **ABSTRACT**

*Avia Residence is a 1-star inn which is the beginning of the Avia Group's tourism business. Avia Residence is located in the Tomang area of West Jakarta and has 3 types of bedrooms. Based on interviews with the leadership of Avia Residence, the problems caused by the promotion used by Avia Residence are only through brochures and social media. The tool only gives a little information to prospective guests about the rooms and facilities that is only by photos and writing, this is less effective because it can describe the overall condition of the room and facilities. Then the reservation is still ineffective because there can be errors when making a room booking. The data collection stage was carried out in this research by using the interview method, literature study, questionnaire, and observation. The next stage of the method used for software development used by the author is the Luther Sutopo Method Development. The MDLC method consists of several stages, namely concept, design, material collecting, assembly, testing, and distribution. The application built is a virtual tour application using the stitching method in which the process is used in stages starting from the collection of photos, stitching process, then becomes a 360 image and determines the hotspot. The testing process is done by conducting interviews with the leaders of Avia Residence and by questionnaires to customers and prospective customers of Avia Residence. Based on the test results, the virtual tour application can be used as an interactive promotional media for the inn and also to facilitate prospective guests and the inn in making room bookings.*

**Key Words** : Avia Residence, Media Promotion, Reservation, Interactive, Virtual Tour

## **1. INTRODUCTION**

*Avia Group is a company engaged in tourism and property because it provides facilities and services of lodging, food, beverages, and other services. Avia Group began to spread the wings in the area of Bali and Medan by building hotels, villas and resorts to date in the construction process. For now, the Avia Residence is located in the Tomang*

*Road area, more precisely on Jalan Kosambi No. 2 Tomang – West Jakarta. This Avia Residence has 3 room types.*

*Based on the results of an interview with Pak Sandi as the Manager of Avia stated that in running Avia's business is not detached from the competition of the business world market that closely relates to the promotional media used. Avia Residence is currently using promotional media in the form of brochures, while the promotion through the Internet is still done in a pinch, such as uploading it to social media, blogs, and lodging provider websites. With the promotion using brochures still felt less and not optimal this can be seen from the still telephone from prospective customers who will stay asking about the facilities owned by this inn. Although brochures or promotions over the Internet have photos that are expected to depict the circumstances of other rooms and lodging facilities, but in fact photographs that are 2-dimensional images sometimes still confuse potential customers and Finally they kept booking the room via telephone or the website of the accommodation provider after previously asked the property. So the usefulness of the promotion is so less effective. In addition to the room interior, for booking a prospective customer room still contact the inn Avia Residence via telephone and the website of the accommodation provider. Because the room reservation is still like that, then the hotel sense it is still being reduced effectively because there can be an error when booking. Then the property feels difficult to recap the data for the monthly report.*

*The use of Virtual Tour is very widely used for promotional media or the introduction of a location. Some of the places that use the Virtual Tour are museums, tourist areas, schools, colleges, historical places, city parks, hotels, etc. Today to generate immersive and interactive Virtual tours, the VRP (Virtual Reality Photograph) technique is used plus hotspot features [1]. Hotspots here are points or points – certain points in the photo that serve as a hyperlink to go to the other photo's display. This feature is built so that users can venture into the Virtual Tour, creating an immersive sensation, as if – to be in place when the photograph is taken [2]. In previous research, according to Andreas Rio Adriyanto, the application of virtual tour in a place*

provides a deeper experience than the static display photos of one particular side [3]. Then in other research conducted by Dianto G. Thomas Virtual Tour can captivate tourists or long-distance and facilitate users to see the location of the accommodation with 360° View [4]. Then in previous research done by Achmad Choiron use panellum tools that help for the creation of dynamic Virtual Tour [5].

With the problems that have been explained, build a Virtual Tour and reservation application at the Avia Residence to complement the promotional media by adding the booking feature. With this application can facilitate prospective customers to know the state of the room interior and available room facilities can then improve the efficiency of the promotion and also can improve the competitive advantage with the company Other accommodation.

## 2. RESEARCH CONTENT

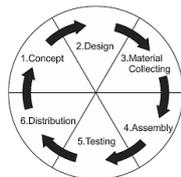
### 2.1 Theoretical Basis

#### 2.1.1 Virtual Tour

Virtual tour basically provides a simulation view as if the user is in an image or location immortalized by a photographer that is processed in such a way as to allow the user to interact directly with the virtual place. [2]

#### 2.1.1 Luther Sutopo Method

Multimedia development is based on 6 stages, namely concept, design, material collecting, assembly, testing, distribution. The sixth stage does not have to be sequential in practice. Each stage can exchange positions, although once the concept stage does have to be the first thing to do. Below are the pictures of Luther – Sutopo method. [6]



**Figure 1** Development of Luther's Multimedia – Sutopo

#### 2.1.3 Multimedia

Multimedia is a computer utilization to create and combine text, graphics, audio, Figure moving (video and animation) by combining text, links, and tools that allow users to navigate, interact, create and Communicate. [7]

#### 2.1.4 Website Techonology

World Wide Web (WWW) is a large-scale information provider system that manages the information distributed on the Internet using hypermedia technology [8]

#### 2.1.5 Personal Home Page (PHP)

Personal Home Page (PHP) is a Server Side programming language designed specifically for Web applications added to HTML. The nature of server side means that the script will be performed on the server, only then the results are sent to the browser. [9]

#### 2.1.6 Blackbox Testing

Blackbox Testing is a test focused on the functional specifications of the software. Testers can define a set of input conditions and test the functional specifications of the program. [10]

#### 2.2 Problem Analysis

Problem analysis is the first step of the system analysis process. This step aims to find out what is happening in the current system. Analysis of the problems of the currently running system in the Avia Residence is:

1. By using promotional media in the form of brochures or Figure 2 dimensional less can Figure out the Avia Residence room with details.
2. Room reservation system is still manual so it is still less effective.
3. Difficult to recap report data for reservation.

#### 2.3 Analysis of System to be Built

The system procedure will be proposed as follows:

1. Guests open the Avia Residence website.
2. Then guests choose the Virtual Tour menu to tour the Avia Residence.
3. After selecting the Virtual Tour menu then the system will display the Virtual Tour view and information.
4. At the time of the Virtual Tour, guests will get the room's visuals, facilities and information at the Avia Residence.
5. From the Virtual Tour, you can choose the Reservation menu if guests feel the room is suitable.
6. On the reservation menu, guests are expected to fill reservation data.
7. With it the system will check that the room is available or not.
8. If the room is not available then return to the reservation page
9. If the room is available then the reservation will be made.
10. The system will do the booking data and display the total price for the guest.
11. Guests must complete payment using the transfer to the Avia Residence account.
12. Guests must complete the payment confirmation form.

13. The system will display confirmation of payment which will be validated by admin.
14. If the payment is invalid it will be notified to the guest and must make the payment.
15. If a valid meal payment will display the payment transaction status then confirm the order.
16. Guests will get an order confirmation and stay checked in on the date specified.

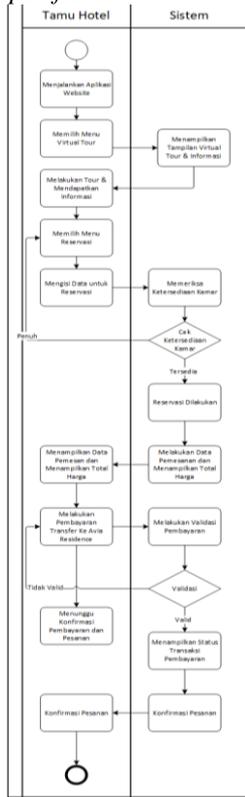


Figure 2 The procedure to be constructed

#### 2.4 System architecture

Application to be built website based, here is Figure an architecture system to be built. The system has two interfaces namely Frontend and Backend. The overall system architecture to be built can be seen in Figure 3:

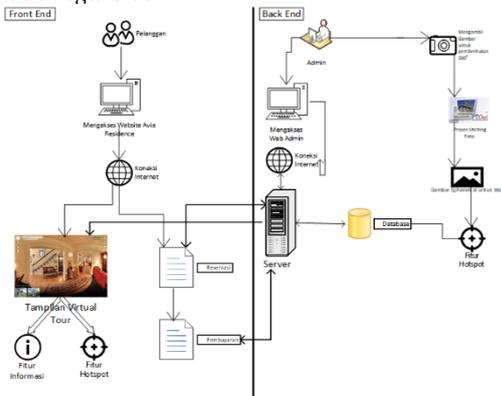


Figure 3 System Architecture

#### 2.5 Virtual Tour Analysis

To create a Virtual Tour the first step to do is to collect the photo assets such as the camera, lens, and tripod needed and then make a panoramic photo, then the Figure is presented into the Panorama 360 and added hotspots as nodes to navigate from one location to another.

Figure an creation process from the Virtual Tour application can be Figures with the flow as seen in Figure 4. Where the process of the application of Virtual Tour is divided into four main stages, namely:



Figure 4 Creation of Virtual Tour application

##### 2.5.1 Photo taking techniques

Before making a panoramic photo The first step is to collect assets in advance by preparing the camera, lens, and tripod used to create panoramic photos. If using a camera that is not a special camera of 360 degrees and the lens will need a Figure about 30 more Figure files to form a panorama. The lens that the writer uses to make a panoramic photo is a Fisheye lens.

The factors that determine whether or not the image stitching process is made of photo-taking techniques, by estimating each component of the photograph being photographed and observing two parameters to reduce the distortion effect of the photo. The best way in the shooting process is to shoot vertically. In this technique requires the process of performance in editing to minimize the results that are not perfect on the photo.

Good photo merging, the ideal percentage for photo buildup is 20%-30%. The panorama shoot should use a tripod to make it more stable. In the process of shooting using some settings such as angle and lighting.

##### 2.5.2 Image Stitching Process

This process is a merger of two adjacent figures and has the same section or view. The Sticking Image requires a method of knowing the points of the equation in the next Figure and figure. After overlapping parts are found, the Figure can be stacked with another Figure in the overlapping part and become a complete big Figure.

It is assumed that when the photographs were taken, there was part of the scene that was captured twice on the sequentially taking photos. The first thing to do is that the process of finding an important point or KeyPoint is marked with the same number and color in the Figure as shown in Figure 5. Where 3D Vista Sticher programs look for similarities between Figure A and Figure B equate the same points as keypoints and so on Figure B and a same for stitched.



Figure a Figure b  
Figure 5 Set Keypoint

### 2.5.3 Build 360° View

Spherical (equirectangular) Panorama is a mapping method that is still popular to use. Because it consists of a wide single rectangular Figure and its height correlates to 2:1. Then the mapping method requires the help of 3D Vista conversion software. Here is the result of the spherical panorama process using 3D Vista Stitcher can be seen on Figure 6:



Figure 6 Results of the panorama spherical process

### 2.5.4 Placement Hotspot

Hotspot is the navigation marker point to perform migrations from one location to another or the annotation in a panoramic view. After the 360-degree image creation is formed, then it determines the hotspot.

The position of the hotspot placement is done in 3d Vista application and can be done to determine hotspots based on building floor plan.

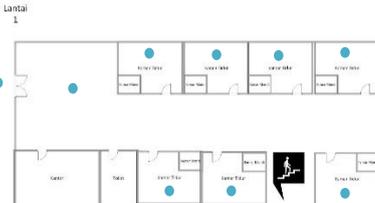


Figure 7 Results of the panorama spherical process

## 2.6 Functional Needs Analysis

### 2.6.1 Context Diagram

Here's a context diagram of a virtual tour and reservation application at the Avia Residence, viewable in Figure 7.

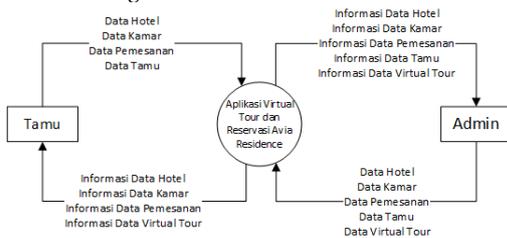


Figure 8 Context Diagram

### 2.6.2 Data Flow Diagram

The following is the DFD level 1 of the Virtual Tour and reservation application at the Avia Residence as seen in Figure 9.

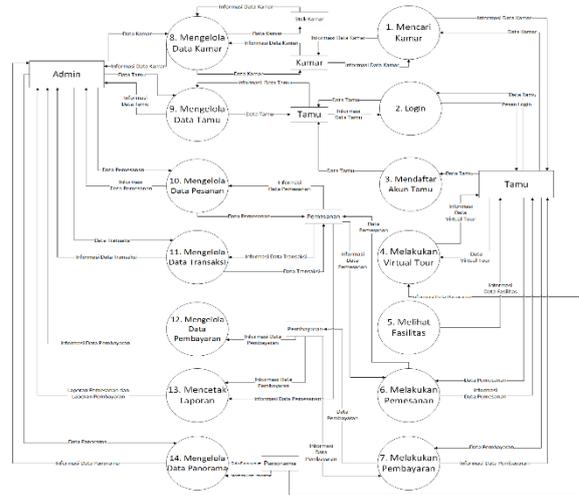


Figure 9 Data Flow Diagram Level 1

## 2.7 System Design

Design of the system aims to illustrate aspects that will be the solution in the planning of the built.

### 2.7.1 Relationship schemes

The relationship scheme of the Virtual Tour and reservation application at the Avia Residence is as follows:

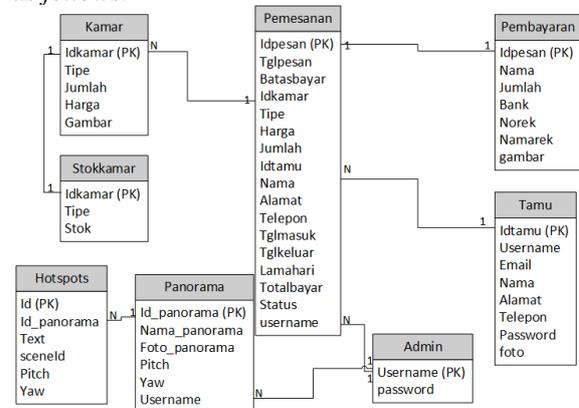


Figure 10 Relationship schemes

### 2.7.2 Guest Menu Structure

The guest menu structure design is an overview of the path of application usage. The design of the guest menu structure can be seen in Figure 11 as follows:

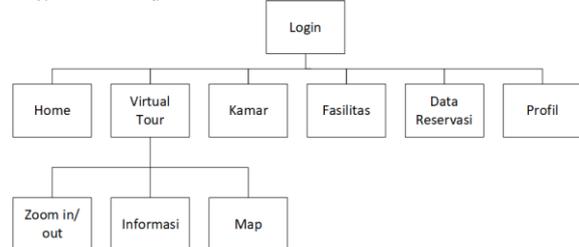
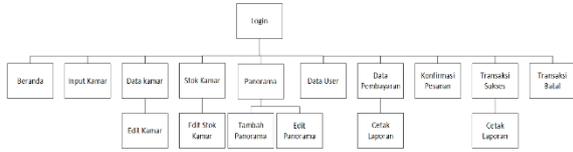


Figure 11 Guest Menu Structure

**2.7.3 Structure Menu Admin**

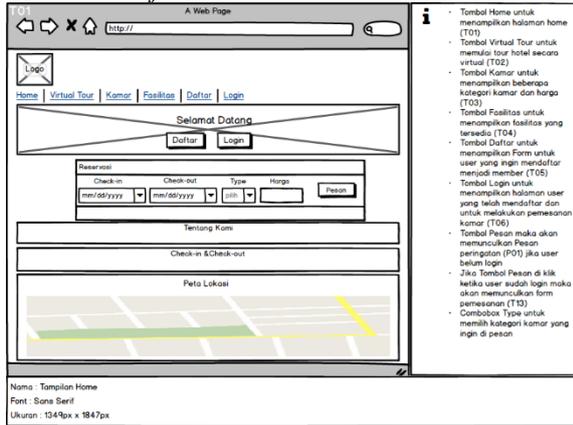
Admin menu structure Design is the image of the path of application usage. The admin menu structure design can be seen in Figure 12 as follows:



**Figure 12 Structure Menu Admin**

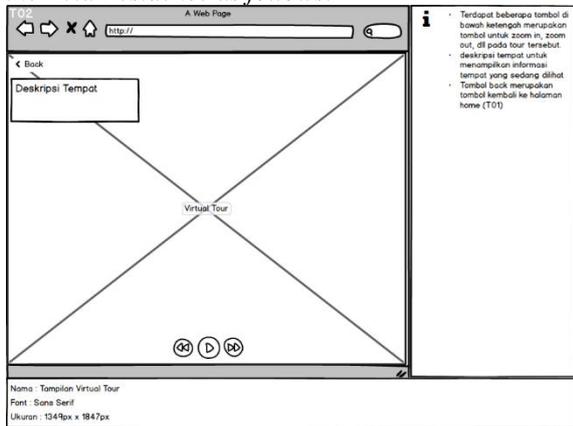
**2.7.4 Interface Design**

Interface Design the guest home page of the Virtual Tour and reservation application at the Avia Residence as follows:



**Figure 13 Home Page Interface Design**

Design of interface Virtual Courtyard Guest tour the Virtual tour and reservation application at the Avia Residence as follows:



**Figure 14 Interface Design Virtual Tour page**

**2.8 Blackbox Testing**

Testing is done by testing each process and possible errors occurring for each process. This test was done in Black Box, that is by noting the input to the system and the output of the system. As for the black box testing plan the Virtual application of the Tour and reservation at the Avia Residence is as follows.

**Table 1 Testing plan**

Test Item	Test Details	Types of testing
Login	Admin and Guest	Black Box

	Login verification	
Registration	Guest Registration Verification	Black Box
Guest Account Profile	Change Guest Account Profile Data	Black Box
Room Data Processing	Room Reservation	Black Box
	Addition of room Data	Black Box
	Room stock Changes	Black Box
	Change Room Data	Black Box
Payment Data Processing	Printing Payment Data Results	Black Box
Payment Confirmation	Making a payment	Black Box
	Payment verification	Black Box

**2.9 Blackbox Test Results**

Based on the test results with the example of the above test case can be said that almost every process in the system that is built in error still has possibility to occur, but functionally the system can provide results The expected output.

**2.10 Beta Testing**

Testing of this user is done by conducting a test to research site by using interview methods and testing with customers. Testing of the Penguana is divided into two namely admins and guests. Here's testing against users:

**2.10.1 Beta Testing of Admin**

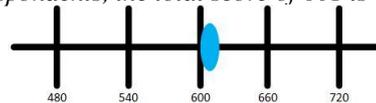
Testing of the admin is done by doing a live test in the research with the interview method.

Based on the results of the interview concluded that the Virtual Tour and reservation application at Avia Residence can assist in promotion and bedroom reservation. The Admin is very enthusiastic to use the application because it is quite complete because there is for promotional media and reservation of the room. There are only a few things that admins will want to be able to get into the system better for their operation.

**2.10.2 Beta Testing of Guests**

Testing of guests was done by conducting live testing using the questionnaire method. Calculations for questionnaires use a Likert scale, where each statement has a weighted value.

Based on the total score of the questionnaire to 30 respondents, the total score of 601 is obtained.



**Figure 15 Likert Scale Results**

Based on the attitude category that has been calculated earlier, the score 601 belongs to the category of attitude agree with Virtual Tour app that makes it easy for guests to get the Avia Residence information. And based on the total of the survey results stated that the second statement stating that

the Virtual Tour application and Reservasi provide the Virtual Tour application to facilitate the guests in obtaining information about the facilities, checkers room Get the highest total score from the questionnaire results.

### 3. CLOSING

#### 3.1 Conclusion

Based on the results obtained in the writing of this final assignment, the conclusion can be drawn as follows:

1. With the virtual tour application as an interactive promotional media to facilitate the Avia Residence guests.
2. Facilitate the consumers to obtain information such as facilities through the 360-degree panoramic Figure and also display the room details in the Avia Residence.
3. Reservation features make it easier and more effective to make bookings available at the Avia Residence and make it easy for admins to manage their room.

#### 3.2 Suggestions

Advice for the development of Virtual tour applications and reservations that can be done, among others:

1. The reservation features in the Virtual tour and reservation application to facilitate the customers in booking the room.
2. Perform the stitching process without using additional applications.
3. Add a virtual account feature to help when making a payment.

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