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## Design and Build an Eco Edu Tourism Application Using a Virtual Tour Guide in the Thematic Eco Enzyme Village, Padang City

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### ABSTRACT

The idea for the Eco Enzyme Thematic Village came about seeing the waste problem as a homework for urban areas. Based on the government decision of West Sumatra regulation number 286 of 2021 concerning 11 Locations and Themes for the Thematic Villages of Padang City in 2021 - 2024. One of the thematic villages is located in Andalas Village, namely the Eco Enzyme Thematic Village which was held by Waste Bank office unit at the Andalas. The pioneered of Eco Enzyme Thematic Village is Mr. Syaifudin Islami, M.Sc. This is one of community service activities aims to increase awareness and also educate the public to be willing to participate in waste management, especially in the Andalas Village area. In addition, to promote the Eco Enzyme Thematic Village area in waste processing. This community service offers a solution to promote Eco Enzyme Thematic Villages in Virtual Tour Guide Education (Panduan Wisata Edukasi) in the implementation and prospects of processing waste into Eco Enzymes. the application of virtual tour guide applies the SDLC (System Development Life Cycle) method using the waterfall model for system development and UML (Unified Modeling Language) as a design tool. The expected results in using the latest technology, namely VR (Virtual Reality), can be a promotional and educational media that helps people know in real terms and seem to be involved in it.

## 1. Introduction

The Padang City Environmental Service (DLH) stated in 2019 that in the next three to four years, the pile of garbage in the Padang City, Air Dingin. Final garbage disposal is predicted to get higher and cannot be accommodated anymore (Diniaty & Ariska, 2018). This condition will be very dangerous for the environment and residents' settlements around the Final garbage disposal location because the pile of garbage has the potential to experience landslides, especially when it rains (Gunawan, 2015). So that it needs more attention by the government in order to obtain a more effective waste management before it actually happens (Ariska, 2021).

Since the Covid-19 Pandemic, the Padang City Government has implemented WFH and SFH since the end of March 2020, most community activities are carried out from home (Putri, 2021). Even since April 22, 2020, the Padang City Government has imposed PSBB (Large-Scale Social Restrictions) to prevent the expansion of the corona virus infection. During this PSBB, community activities outside the home are limited. Due to the many activities carried out from home, it is estimated that it will cause changes to the generation and composition of waste generated from households (Rina, 2021). This situation is caused by changes in people's lifestyles during the Covid-19 pandemic, one of which is the rise of online orders. Based on research data from Hafiz (2017), in 2016 the waste generation generated from domestic sources (households) in Padang City was 0.201 kg/person/day with the largest composition of waste being organic waste from food waste 67, 25% and 16.17% plastic waste (Hafizh, 2017) (Raharjo & Geovani, 2014). One of the ways to overcome this waste problem is the Eco Enzyme Thematic Village.

Based on the decision of the Mayor of Padang Number 286 of 2021 concerning 11 Locations and Themes of Padang City Thematic Villages in 2021 - 2024 (Septa, 2021). One of the thematic villages is located in the Andalas Village, namely the Eco Enzyme Thematic Village which was held by Waste Bank office unit at the Andalas street. The pioneered of this village by Mr. Syaifudin Islami, M.Sc. Eco Enzyme Thematic Village is located on Jl. Andalas No. 90 D RT 02 RW 04 Andalas Village, East Padang District, Padang City. The idea for the Eco Enzyme Thematic Village came about seeing the waste problem as a homework for urban areas. Based on the problem the Eco Enzyme Thematic Village, of course this can reduce the existing waste problem (Fitria et al., 2008). Eco Enzyme is the result of fermentation of organic kitchen waste (garbage) mixed with sugar and water with a ratio of 3:1:10 for 3 months (Sinaga, 2009) (Hati, 2018) (Siska & Salam, 2012). This Eco Enzyme is usually used as liquid organic fertilizer for plants, detergents, floor cleaners, pesticide residues, scale, air cleaning water, insect repellent, and many other purposes (Jalaluddin, 2016) (Anif et al., 2007). In addition to the utilization of waste processing into Eco Enzymes at the Andalas Unit Waste Bank, it is agreed that the waste is also used to feed the larvae of black maggots and for plastic waste (drink bottles) it can be used as a container for Eco Enzymes as well as merchandise or souvenirs. The products in the Eco Enzyme Thematic Village can be seen in Figure 1 and the product process can be seen in Figure 2.



**Figure 1.** Eco Enzyme Thematic Village Products

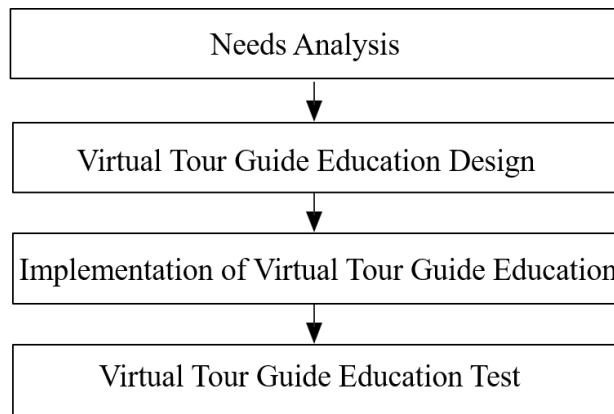


**Figure 2.** Eco Enzyme Production Process

Partner conditions and problems faced are as follows in promotion and product marketing. During the COVID-19 pandemic, so far, people are less enthusiastic about waste management and not many people know about the benefits of processing waste into Eco Enzymes or others. So, to get raw materials in the form of organic waste is constrained. Until now, products are only marketed during events or bazaars held by the Padang City Government.

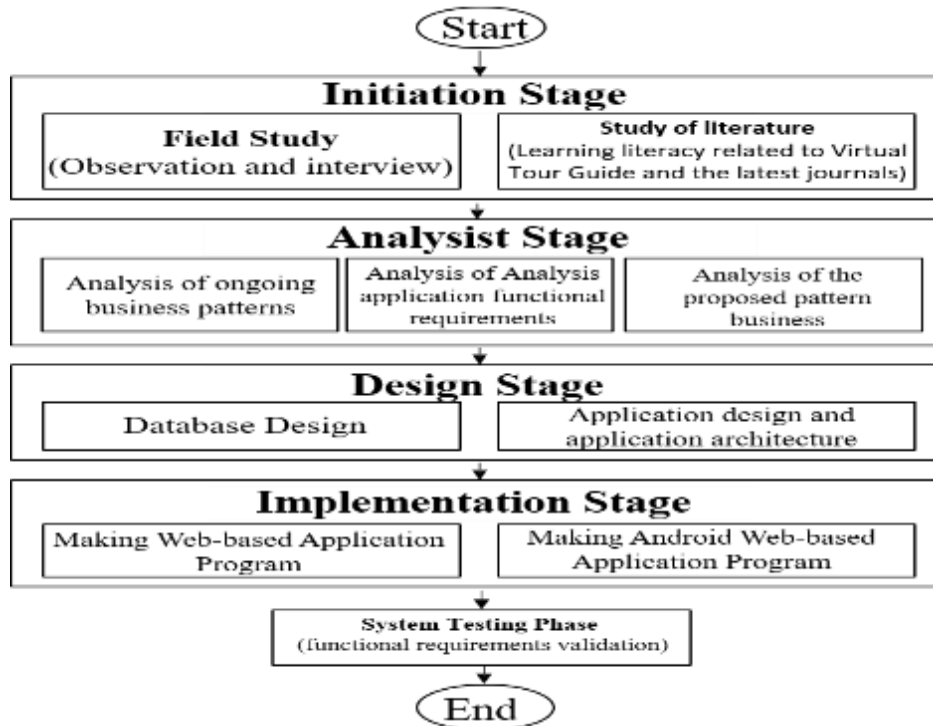
## 2. Methods

The method of implementing this community service activity can be seen in Figure 4.



**Figure 3.** Method of Service Implementation

From Figure 3 it can be seen that the focus of this service is on the Design and Development of the Virtual Tour Guide Education Application (Juliany et al., 2018) (Widaningsih & Suheri, 2019). The detailed research workflow is described in Figure 4.



**Figure 4.** Flowchart of devotion

This activity will involve the management of the Eco Enzyme Thematic Village and residents around R03 and RW04, East Andalas Village. From the analysis of the situation and problems faced by partners, it can be stated that the selection of science and technology was determined to resolve and find solutions to Partner problems for ± 10 months, as shown in Table 1.

**Table 1.** Troubleshooting Solutions

Aspects	Problem Partner	Problem Solving
Product	Raw materials are hard to find during the Pandemic Not many people to understand the benefits and uses of eco enzymes	Conduct socialization both online and offline. Create a Virtual Tour Guide Education using the latest technology (VR=> Virtual Reality)
Marketing	The products sold are only marketed through bazaars or events from the Padang City Government	Create Virtual Marketplace to grab more market share

The types of outputs generated from each solution for partner problems can be seen in Table 2.

**Table 2.** Types of Outputs to be Generated from each Problemsolving Solution

Aspects	Troubleshooting Solution	Conditions Before Activities	Problem Solving Output Targets (Condition After Activities)
Product	Conduct socialization both online and offline. Design and Build a Virtual Tour Guide Education using the latest technology (VR=> Virtual Reality)(Jan et al., 2009)(Weitnauer et al., 2008)(Leuski et al., n.d.)	There is no good socialization and the use of the latest VR technology which is currently trending in welcoming the metaverse era(Kopp et al., 2005)(Gayle & Manocha, 2008)	There will be a promotional video and an Eco Enzyme Thematic Village Educational Virtual Tour from 5 Topics 1. Garbage Bank Which consists of making Appropriate Technology (TTG): Solar Biodigester, and Composter 2. Eco Enzyme Bank Which consists of making dish soap and clothes as well as hand sanitizer 3. Magot's house Which consists of processing fresh magot, dry magot, and egg magot 4. Arena Andalas Serumpun (GAS) As a place for sports and cultural week in the location of Thematic Village 5. MSME Which consists of MSMEs involved both in production, production processing, and marketing of products from the Eco Enzyme Thematic Village
Marketing	Create Virtual Marketplace to grab more market share	Currently there is no online media or online marketing application	Virtual Market is created by applying the concept of a virtual market by adding VR features in it

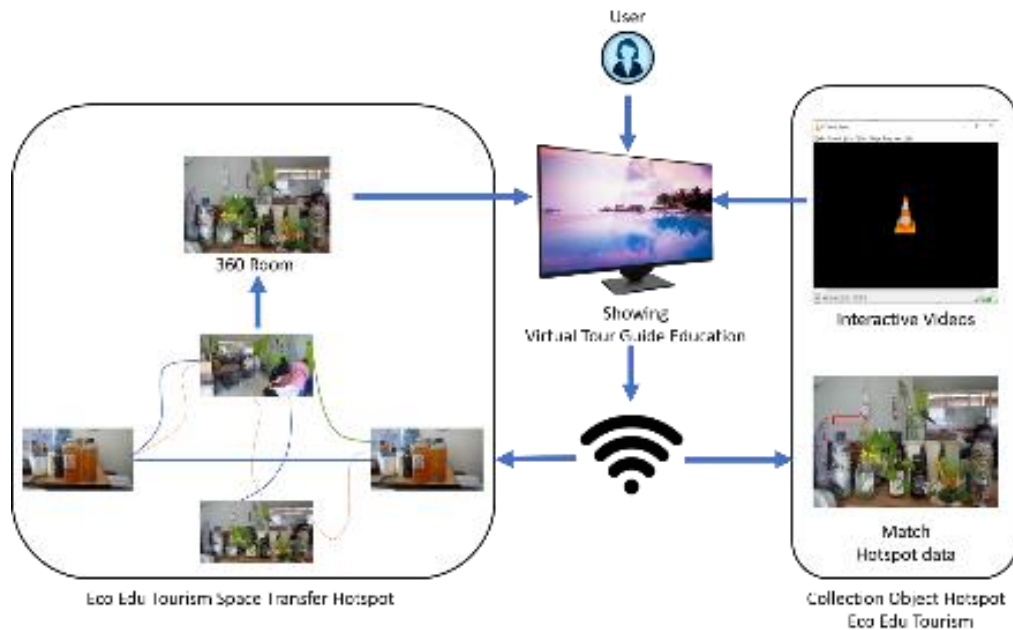
### General Stages of activities

According to the method of service implementation, first stages begin with the initiation stage to understand the workflow of Eco Edu Tourism using a Virtual Tour Guide. This process involves interviews and direct observations with related parties. Furthermore, a joint requirements analysis related to functional applications is formulated that is suitable to be applied. Then proceed to the design stage, which focuses on database design and application model design using UML. Once designed, this application will be built with program code using the PHP programming language. If the application has been built, then a system test will be carried out involving the Eco Enzyme village manager.



### 3. Results and Discussion

The results of this study are the creation of an Eco Edu Tourism application using a Virtual Tour Guide with an application design that can be seen in Figure 5.



**Figure 5.** Eco Edu Tourism Application Design Using Virtual Tour Guide

The process starts from taking 360° photos and videos which are integrated each at several points to get a virtual concept form that will be displayed later. After going through the process of integration and testing (integration and test) in the manufacture of eco-edu tourism using a virtual tour guide, the next step is the implementation of the application. The appearance of the eco edu tourism application using a virtual tour guide can be seen in Figure 6.



**Figure 6.** Display Figure 360° Eco Edu Tourism Application Using Virtual Tour Guide

Display Image 360<sup>0</sup> will look so real when using Virtual Reality (VR). As for the display in the web browser, usually using the button or by holding down the right click on the mouse while moving it to the desired place. Meanwhile, the virtual market display using a web interface can be seen in Figure 7.

### Landing Page



**Figure 7.** Eco Edu Tourism Virtual Market

The virtual market is created to be able to sell products from eco-enzyme thematic villages. Through the website that has been provided, customers can actually see the products sold by the eco enzyme thematic village. For the delivery process, there are Gojek, Sicepat, JNE, Grab, and other expedition services provided by the application.

#### 4. Conclusions

Some things that can be concluded from the results of this service include:

1. The design of this Virtual Tour application has been successfully created as a medium of information, promotion and marketing in the thematic eco-enzyme village of Padang city.
2. This application is designed according to the concept that has been created, which is to explain the description of the room, and the environment in the thematic eco-enzyme village of Padang city by using a 360o panorama, so that users feel real in the room or in that location.
3. This application was built using the stages of the SDLC Waterfall method with the design of the Eco Edu Tourism Application Using a Virtual Tour Guide.

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