



# Virtual Tour of Putra Deli Beach as a Media Digital Transformation of Tourism

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## ABSTRACT

*A virtual tour is a technology that can map the physical form of a place into a 360° representation, transforming it into a virtual reality experience. This technology can store panoramic landscape information in 360°, simulating a visit to a place virtually. Pantai Putra Deli, located in Kecamatan Pantai Labu, Kabupaten Deli Serdang, Sumatera Utara, is a natural beach attraction frequently visited by both locals and out-of-town visitors. It is recognized as one of the local wisdom tourism spots in Kecamatan Pantai Labu. This research aims to develop a virtual tour of Pantai Putra Deli to create and build digital tourism transformation in the Kecamatan Pantai Labu area. The primary objective is to introduce Pantai Putra Deli as a local cultural value from Kecamatan Pantai Labu to the entire Indonesian community through virtual tours. The urgency of this research lies in its potential to promote the unique attractions of Pantai Putra Deli and contribute to the digital transformation of tourism in the region. Overall, this research highlights the importance of integrating modern technology with cultural preservation and tourism promotion, ensuring that Pantai Putra Deli's charm is accessible to all.*

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## 1. Introduction

Technology did not stop evolving in the Industry 4.0 Era; it continues to develop in the current Society 5.0 Era. Technology is also progressing as we approach the Metaverse Era, a time when technology can surpass the physical world [1]. The Metaverse Era represents a turning point where everything can be done virtually, including tourism [2]. One of the currently popular ways to travel is through virtual tours [3]. A virtual tour is a technology that can map the physical form of a place into a 360° representation and translate it back into a virtual reality experience. This technology can store panoramic landscape information in 360°, simulating a visit to a place virtually [4].

Pantai Putra Deli is a natural beach attraction located in Kecamatan Pantai Labu, Kabupaten Deli Serdang, North Sumatra. It is one of the most frequently visited tourist spots by local residents [5]. Occasionally, visitors from out of town also seek this tourist attraction. Pantai Putra Deli offers more than just water-based tourism; it also provides scenic beach views that soothe the eyes, the sound of waves that calm troubled minds, neatly arranged

huts decorated with various ornaments, free karaoke entertainment on weekends, and the hospitality of the local vendors, which adds to the charm of Pantai Putra Deli [6].

Local wisdom represents the noble values within community life, including sustainable environmental management, as stated in Law No. 32 of 2009, Article 1, Number 30. Local wisdom can be considered iconic or characteristic of a region [7]. It is essential to develop and preserve local wisdom as it reflects the identity of a region. One example of local wisdom in Kecamatan Pantai Labu is Pantai Putra Deli. This is evident from the local perception that if someone goes to Pantai Labu, besides looking for the Fish Auction Center (TPI), they will also look for Pantai Putra Deli [8].

Digital transformation in tourism is an effort to integrate modern technology into the tourism sector to enhance efficiency, accessibility, and the tourist experience [9]. This involves using advanced technologies such as virtual reality (VR), augmented reality (AR), big data, the Internet of Things (IoT), and artificial intelligence (AI) to create innovative solutions in promoting, managing, and operating tourist destinations [10]. Through digital transformation, information about tourist destinations can be more easily accessed by potential tourists, while tourism managers gain deeper insights into tourist preferences and behaviors [11]. Additionally, digital technology enables more immersive and interactive tourism experiences, such as 360° virtual tours that can replace or complement physical visits [12]. This transformation not only increases the attractiveness of tourist destinations but also promotes local economic growth and environmental sustainability by reducing the negative impacts of over-tourism [13]. Thus, digital transformation in tourism is a crucial step in addressing challenges and leveraging opportunities in the digital era [14].

Despite the increasing use of virtual tours in tourism, particularly with advancements in digital transformation and immersive technologies, there remains a gap in how local wisdom-based tourism destinations like Pantai Putra Deli are represented and promoted through virtual platforms. Many previous studies on virtual tourism focus primarily on urban destinations, well-established tourism sites, or commercial tourism applications. However, there is limited research on the application of virtual tour technology in promoting and preserving local cultural tourism sites in rural or less-known areas.

Additionally, while previous studies have explored virtual reality (VR) and augmented reality (AR) applications in tourism, few have specifically analyzed the effectiveness of 360° virtual tours in engaging users and enhancing the tourism experience for less accessible destinations. Furthermore, most research on digital tourism transformation does not address the specific challenges and opportunities for local community engagement and economic sustainability through virtual tourism platforms.

Another gap identified is the technical limitations of current virtual tour platforms, which often require high-specification hardware and software. Many virtual tourism studies rely on advanced platforms such as Unity or Unreal Engine, which may not be feasible for all tourism stakeholders, particularly those in developing regions. This study aims to address this limitation by using Theasys and 3Sixty, providing a more accessible solution for developing immersive digital tourism experiences.

The urgency of this research lies in the fact that Kecamatan Pantai Labu does not yet have a tourism concept based on virtual tours. Therefore, developing a virtual tour of Pantai Putra Deli is necessary to create and build digital tourism transformation in Kecamatan Pantai Labu. The editors to be used in the research "Virtual Tour Pantai Putra Deli as a Medium for Digital Tourism Transformation" are Theasy and 3Sixty [15].

## 2. Method

This research uses the Multimedia Development Life Cycle (MDLC) method. The stages in the MDLC method can be seen in Figure 1 below:

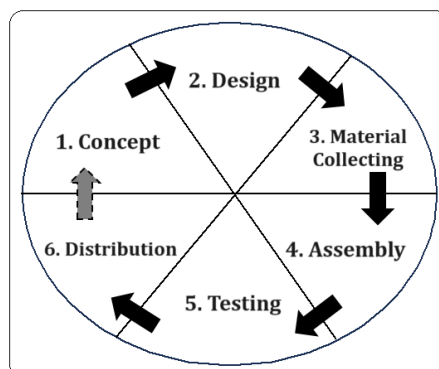


Figure 1. The Cycle of the MDLC Method

### 2.1 Concept

The following are details of the concepts in Virtual Tour of Putra Deli Beach research as a Digital Tourism Transformation Media:

Table 1. Concept Description

Concept Category	Concept Description
TITLE	Virtual Tour of Putra Deli Beach
TYPE OF MULTIMEDIA	Multimedia information about Putra Deli Beach in the form of a 360° Virtual Tour
OBJECTIVE	Introducing Putra Deli Beach as one of the local wisdom values of Pantai Labu District to all levels of society in North Sumatra through a virtual tour.
TARGET	Prospective Visitors in North Sumatra and Visitors to Putra Deli Beach
AUDIO	Malay Backsound
PICTURE	Using Image 360° Putra Deli Beach

The use case diagram of the Putra Deli Beach virtual tour can be seen in Figure 2. Actors in the use case diagram design are Admin and Tourists. Admin has the task of managing 3Sixty images or 3600 images on the virtual tour of Putra Deli Beach, while tourists in terms of visiting or viewing 3600 images on the virtual tour of Putra Deli Beach.

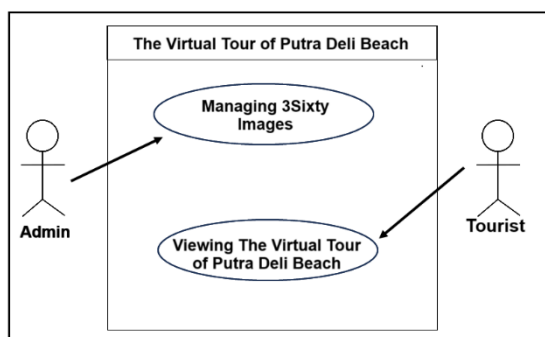


Figure 2. Use Case Diagram for the Pantai Putra Deli Virtual Tour

In addition to the use case diagram, the following is the activity diagram for the Pantai Putra Deli virtual tour:

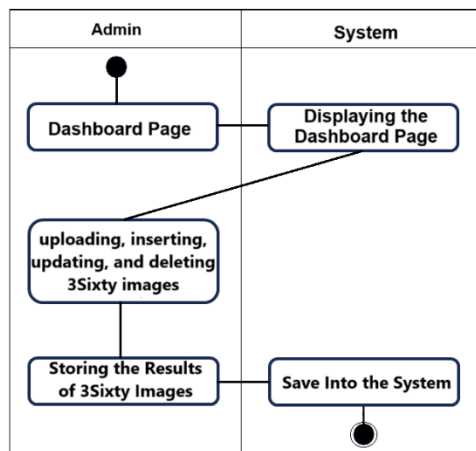


Figure 3. Activity Diagram for the Pantai Putra Deli Virtual Tour

## 2.2 Design

The application design was made in this stage in the form of an Interface Menu (Interface) in the Virtual Tour of Putra Deli Beach as follows:

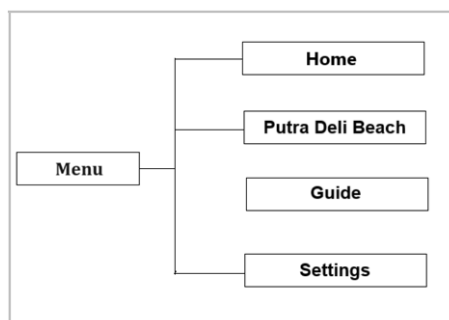


Figure 4. Interface Menu

## 2.3 Material Collecting

The development of the Virtual Tour of Putra Deli Beach required both software and hardware components to ensure an immersive and interactive digital experience. The software used included Microsoft Windows 11, Microsoft Office 16, Theasys, 3Sixty, Canva, and Google Street View, which facilitated the creation, editing, and deployment of the 360° virtual tour.

For hardware, the study utilized a computer with an 11th Gen Intel® Core™ i5-1135G7 processor, 8GB RAM, SSD 256GB and HDD 1TB storage, along with essential peripherals such as a monitor, mouse, keyboard, and speakers. Additionally, a GoPro Max camera was used to capture high-quality 360° images, which served as the primary visual data for the virtual tour. These combined resources ensured smooth processing, high-resolution imagery, and an engaging user experience for the digital transformation of Pantai Putra Deli's tourism promotion.

Image 360° is used as Primary Data or Main Data in Virtual Tour of Putra Deli Beach

Research as a Digital Tourism Transformation Media in the design of the Putra Deli Beach Virtual Tour application. The following is one of the samples taken from the Researcher's Documentation in the form of a 360° image of the Putra Deli Beach courtyard.



Figure 5. 360° Image of the Putra Deli Beach Courtyard

#### 2.4 Assembly

This Assembly stage includes the creation of Virtual Tour of Putra Deli Beach Website, which has been equipped with several tools, one of which is the Transform Tool and Rotate Tool which function as tools that can move or shift images as wide as 360°, namely to the left, right, up, down and rotate as wide as 360°. The following is an illustration of the appearance of Virtual Tour of Putra Deli Beach Website:



Figure 6. Illustration of the Virtual Tour Website Display of Putra Deli Beach

#### 2.5 Testing

Testing in this study was carried out with the alpha testing stage (alpha test).

#### 2.6 Distribution

The Putra Deli Beach Virtual Tour in this study is presented in the form of a website-based application. The domain name of the website is adjusted to the name of the website, namely

### 3. Result and Discussions

Theasys is a platform that has a function to map the 3Sixty (360<sup>0</sup>) shape of a panorama or object. Theasys is the latest alternative that can be a framework that can help users in mapping the 3Sixty shape of a panorama, but has the constraint of inadequate PC or Laptop device specifications to install software that is commonly used in 3Sixty mapping (in this case such as Unity or Unreal Engine). Here is the initial display of the Putra Deli Beach Virtual Tour:

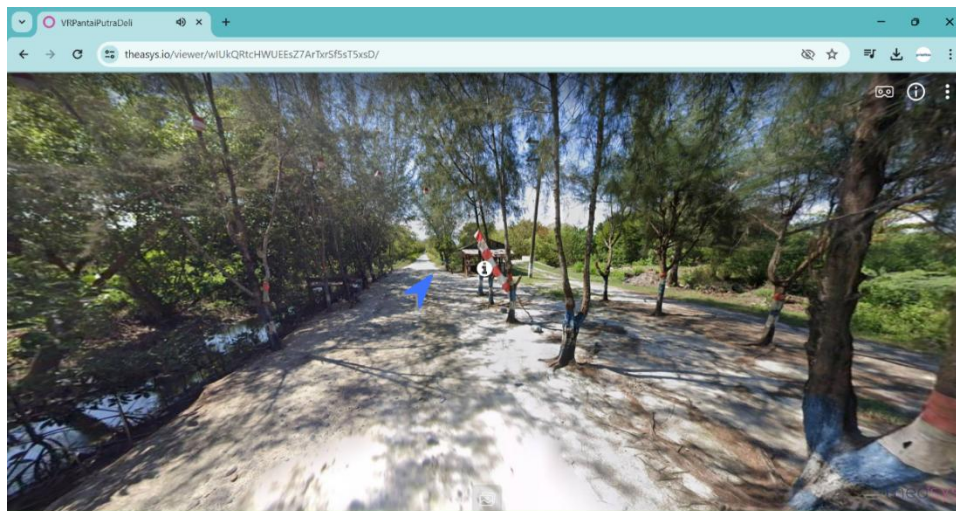


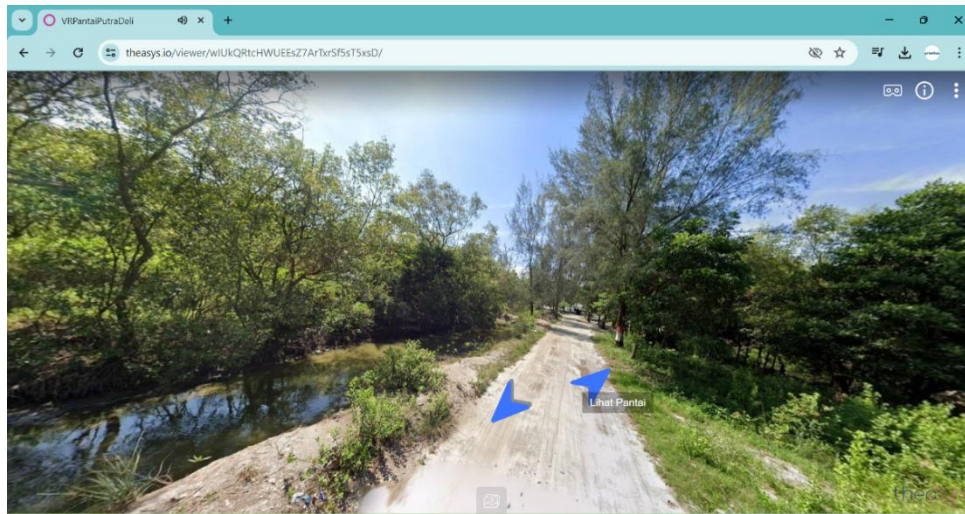
Figure 7. Initial View of Putra Deli Beach Virtual Tour

Figure 7 above is the initial display of the Putra Deli Beach Virtual Tour that has been successfully running on Theeasys. The image has been equipped with the 3Sixty feature (360<sup>0</sup>, namely left, right, up, down and rotating 360<sup>0</sup>), in addition, this initial display is also equipped with Malay music backsound. The blue arrow button in the image above functions as a guide to Putra Deli Beach in virtual form, while the "i" button which means as an information function is an information sign that can be known by visitors (in this case information in the form of entrance ticket prices to Putra Deli Beach). The following is a design image of the entrance ticket price for Putra Deli Beach:



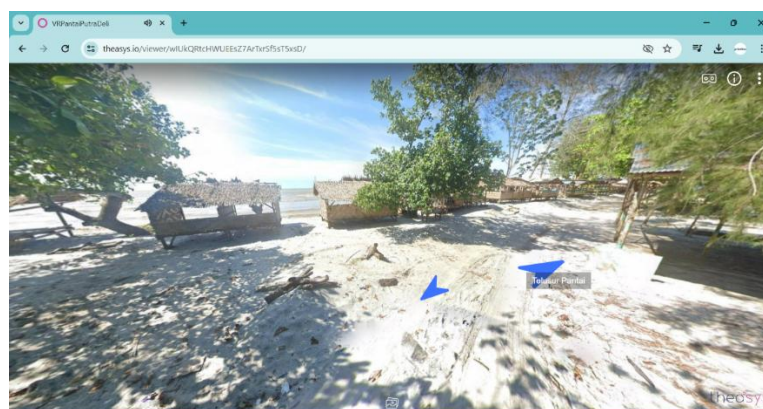
Figure 8. Entrance Ticket Price Design

This initial view also has a hut that is usually occupied by the manager of Putra Deli Beach to collect fees from visitors who come to Putra Deli Beach, as well as the initial gateway to Putra Deli Beach. From the design of the entrance ticket price, it can be seen that the entrance fee for cars to Putra Deli Beach is charged 35.000 IDR while for motorbikes it is charged 10.000 IDR.



**Figure 9.** 3Sixty View of the Road to Putra Deli Beach

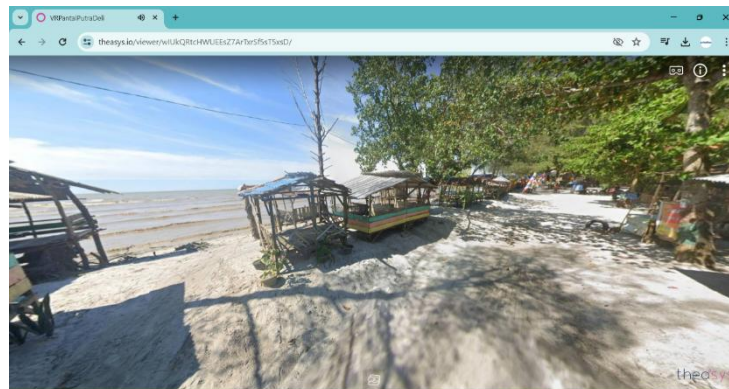
Figure 8 above is a 3Sixty view of the road that visitors will take to enter Putra Deli Beach. In addition to having a background and a 3Sixty display like in figure 6, this display also has back and next buttons represented by blue arrows. The back button functions to return to the previous initial display, and the next button functions to move to the Putra Deli Beach parking lot display.



**Figure 10.** View of 3Sixty Putra Deli Beach Parking Lot

Figure 10 above is a 3Sixty view of the Putra Deli Beach parking lot. In addition to having a background and a 3Sixty view like in figures 7 and 9, this view also has back and next buttons represented by blue arrows. The back button functions to return to the road

view to Putra Deli Beach, and the next button functions to move to the Putra Deli Beach Exploration view.



**Figure 11.** 3Sixty Beach View

Figure 11 above is a 3Sixty view of the Putra Deli Beach parking lot. In addition to having a backsound and a 3Sixty view like in figures 7, 9 and 11, this view also has a back button that functions to return to the Putra Deli Beach parking lot view.

This research introduces a novel approach to digital tourism transformation by integrating virtual tour technology with local wisdom-based tourism promotion. Unlike previous virtual tourism studies that focus on popular tourist destinations, this study highlights the importance of digital preservation and promotion of lesser-known but culturally significant sites. By developing a 360° virtual tour of Pantai Putra Deli, this research bridges the gap between modern digital experiences and traditional tourism narratives, making local attractions more accessible to a broader audience.

A key innovation of this study is the use of Theasys and 3Sixty as alternative platforms to create a virtual tourism experience without the need for high-end VR software. This provides a cost-effective and accessible solution for small-scale tourism businesses and local tourism boards to digitize their attractions. The research also explores how virtual tours can enhance user engagement through interactive elements such as informational pop-ups, panoramic storytelling, and audio integration, which are not commonly emphasized in previous studies.

Moreover, the study contributes to the field of digital tourism transformation by demonstrating how virtual tours can support sustainable tourism efforts. Unlike traditional tourism, which can lead to overcrowding and environmental degradation, virtual tours provide a low-impact alternative while still promoting cultural heritage and economic growth. By integrating local narratives and cultural experiences into a digital format, this research preserves and promotes traditional tourism values in a modern technological landscape. Thus, this study not only enhances the practical application of virtual tours in local tourism development but also offers a scalable model for other rural or culturally significant destinations to implement similar digital transformation strategies.

#### 4. Conclusion

This research emphasizes the importance of digital transformation in tourism, particularly for promoting local wisdom-based destinations like Pantai Putra Deli. Virtual tours provide an accessible and immersive alternative to physical travel, enhancing tourist engagement and sustainability. The 360° virtual tour, developed using Theasys and 3Sixty, offers a cost-effective solution to digitally map Pantai Putra Deli, making it available to a wider audience while preserving its cultural significance. Despite the rise of VR and AR in tourism, research gaps exist in applying virtual tour technology to lesser-known destinations, as most studies focus on major tourist sites requiring high-end VR platforms. This study addresses that gap by using a more accessible virtual tour platform, enabling small-scale tourism sectors to digitize attractions without costly software and hardware. The novelty of this research lies in integrating virtual tourism with cultural preservation, ensuring that local heritage remains relevant in the digital era. Unlike conventional virtual tourism, which prioritizes urban and commercial destinations, this study explores how community-driven tourism can benefit from digital experiences through interactive and educational features. For future research, further studies should examine user engagement and travel decision-making influenced by virtual tourism. Integrating AI and AR enhancements could improve interactivity, while exploring mobile-friendly platforms would increase accessibility, especially in regions with limited technological infrastructure. Research on community involvement in virtual tourism development is also recommended to ensure long-term economic and cultural sustainability.

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