Implementation of Madura virtual tourism using web-based H5P

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Abstract. The rapid development of tourism has led to social changes resulting from the interaction of communities with tourists. There is a pattern of behaviour that affects the local community. One of the tours owned by the Pamekasan Regency Government is Jumiang Beach, a tourist destination located in Tanjung Village in Pademawu sub-district. With the increasing number of visits, it will affect the economic development of the community. Currently, tourism has experienced a decline in the number of visitors. Many traders around complain about the little income earned. Researchers intend to improve services by providing promotional media such as organising virtual tours in Madura using H5P for Jumiang Beach tourist sites in Pamekasan Madura so as to improve visitor experience. The MDLC methodology consists of six basic stages, namely concept is the stage for determining the purpose and who is the user of the programme, design is the stage of making specifications regarding system architecture, design, appearance, and material / material requirements for system development, material collection is the stage of collecting materials that are in accordance with the needs being worked on, assembly is the stage of making, testing is the testing stage, and distribution is the stage the system will be stored in a storage medium. There is some information that can be accessed, such as facility information, virtual tours, news, and contacts. There are two actors who act as application users, namely users and admins. In this system, users can view facilities, virtual tours, news, and contact information. There are several features that will be tested including the homepage, virtual tour, facilities, and news. The results of testing the Madura Sea Tour Virtual Tour application system using Blackbox testing show that of the 5 features that have been tested have worked according to their commands and functions.

1 Introduction

The Covid 19 pandemic has had a negative impact on all sectors, especially the tourism sector[1], [2]. The impact causes a weakening of economic activity[3][4]. Economic activities include production, distribution and consumption activities in the tourism sector. Production is the activity of processing goods and services that create utility. The goal is to fulfil human needs including activities to create and increase usefulness. Various economic activities ranging from the tourism sector to trade were forced to close their businesses and lay off their employees. This also supports government regulations to implement social distancing. This method will certainly have a direct impact on the nation's economy, because there will be a large reduction in work activities outside the home[5].

There has been rapid development in the tourism sector which has caused changes in social interactions between the community and tourists. If there are fewer tourists, people's income will decrease. Behavioural patterns of interaction between tourists and the community can influence the economy of the local community. If there are a lot of tourists, it will affect changes in the community's economy, which changes very quickly, and if tourists continue for a long time, there are conditions that influence each other between tourists and the community. This has led to socio-cultural changes that have occurred since the development of the tourism industry. Changing behavioural patterns is an economic benefit, and the existence of jobs is a direct impact on society, changes that are very easy to feel in the short term. The former fishing community will be given new job opportunities and additional jobs as tourist boat captains, tour guides and rental property owners to meet other tourism needs. Tourism activities will be successful if they are supported not only by attractive attractions, but also by the availability of staff to manage tourist attractions well. Tourism must not only develop with attractive tourist attractions, but must also be supported by reliable, skilled and responsive personnel in facing the changes that occur[6],[7],[8],[9].

Based on Law number 10 of 2009 concerning tourism, tourism is a trip undertaken by someone by visiting a certain place for the purpose of recreation, personal development, or studying the uniqueness of the tourist attraction visited within a temporary period of time.[10].

Being a source of foreign tourist visits (tourists) who came to East Java through the Juanda entrance in December 2020 increased by 23.19 percent compared to the number of foreign tourist visits in November 2020, namely from 69 visits to 85 visits. However, the number

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of foreign tourist visits in December 2020 decreased by 99.59 percent compared to the number of foreign tourists in the same period in 2019 which reached 20,546 visits[11].

One of the tourist attractions owned by the Pamekasan Regency Government is the beach tourist destination at Jumiang Beach which is located in Padelegean Village in Pademawu District. One of the tourist areas that is a priority for the development of Pamekasan Regency is Jumiang Beach Coastal Tourism Area which can later be used as a symbol of the coastal tourist attraction of Pamekasan Regency. This tourist attraction on The Jumiang Beach has the potential to be developed, by arranging the ornaments or facilities on The Jumiang Beach. The chairs, tables, gazebos and photo spots at Jumiang Beach are very simple but have the right match to the beach atmosphere and still really maintain the naturalness of The Jumiang Beach [12].

Virtual tour is one of the developments in virtual reality technology which is able to explore a place to get information and an overview of that place using a computer or smartphone. Using technology in implementing virtual tourism is using H5P. Existing virtual tour technology includes 360+180 degree panoramic images[13]. Seeing a representation of a location in a panoramic image can give the impression of being in the middle of that location[14],[15],[16][17].

Based on the description above, the researcher intends to improve services in providing promotional media in the form of Implementing Madura Virtual Tourism Using Website-Based H5P for Jumiang Pamekasan Madura Beach tourist location. The aim of this research is the implementation of Madura Virtual Tourism using website-based H5P by applying interactive multimedia as information media at The Jumiang Beach tourist attraction Pamekasan Madura, so that it can be used as a means of promoting family tourism in Pamekasan and also to commercialize the application so that can support Trunojoyo Madura University in implementing the BLU Campus.

2 Methodology

The research method used is the design and development method for software development using the Multimedia Development Life Cycle or MDLC concept[18][19]. MDLC consists of six basic stages, namely concept, design, material collecting, assembly, testing, and distribution[20][21].
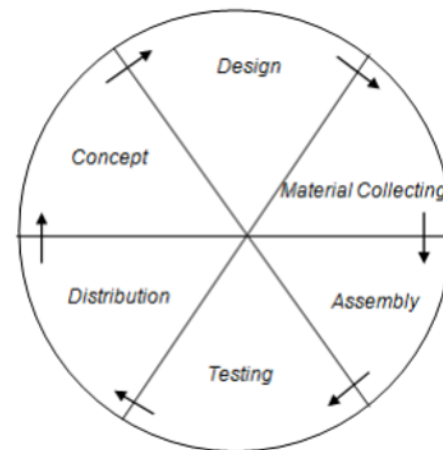

Fig. 1. Multimedia development life cycle diagram.

2.1 Concept

The application that will be built is website-based software that is built dynamically, so that the users of the application consist of 2 users, namely website visitors (users) and website managers (admin). The purpose of the application is as a tool for visitors to get to know existing tourist attractions better, as well as as a tourism promotion medium to increase tourist attraction.

On the main page of the user website there is information about applications that have been created in the form of text and images, as well as a navigation menu to direct visitors to the Virtual Tour and 3D Maps pages. The virtual tour that will be displayed contains a real view of the tourist area in the form of a panoramic photo with a viewing angle of 360° x 180°, while the 3D Maps feature that is displayed functions to represent the location plan of Jumiang Beach.

2.2 Design

Design is carried out to describe system requirements, application workflow, and the expected final results of the application being created.

2.2.1 System architecture design

System Architecture is a mapping or plan for information needs within an organization. Architecture is useful as a guide for current operations or as a blueprint for future direction.

The application that will be built is a website-based application and consists of 2 users, namely admin and user. Here is how the system works.
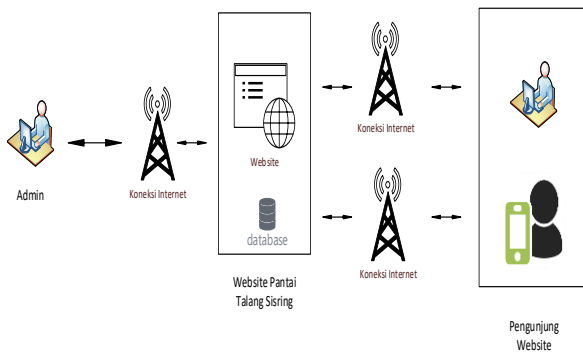
Fig. 2. System architecture.

2.2.2 System usecase design

Use Case Diagram is a diagram that describes all system functionality expressed as transactions that occur in actors and systems. Use Case Diagram in the Virtual Tour application for the Jumiang Pamekasan Beach tourist attraction is in accordance with Fig. 2

In Fig. 2 there are 2 actors who act as application users, namely user and admin. In this system users can view facilities, virtual tours, news and contacts. Meanwhile, admins can manage user data, facilities, virtual tours, news and contacts.
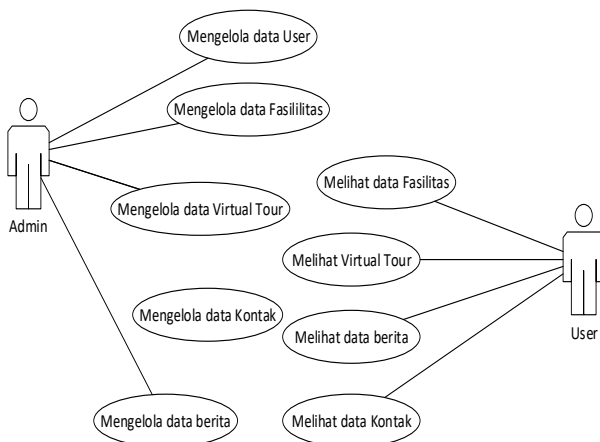

Fig. 3. System use case.

2.3 Material collecting

After designing, the next step is the material collecting stage. Based on how to obtain it, the data needed in this research is divided into two, namely primary data and secondary data.

The primary data in this research is a 360° x 180° panoramic image obtained by taking pictures directly at Jumiang Beach tourist location in several areas, namely Jumiang Beach tourist entrance gate, parking area, playground, and mangrove forest area. At each location point, four photos were taken horizontally, namely front (0°), right (90°), back (180°), and left (270°), as well as vertically, namely top (0°) and bottom (180°). For the 3D Maps feature, the data required is a basic location plan in 2D form as a reference in creating 3D structures[22][23].

Secondary data was obtained from the results of literature studies as reference material regarding theories that support research. Literature study is carried out by reading and understanding materials related to research.

2.4 Assembly

The steps in the application creation stage include the process of combining existing images with Panorama to create a panorama and virtual tour making the image a virtual tour application, creating a location plan in 3D form using the Google Street View application, and the creation process using H5P then becomes a website[24][25].

The displayed Virtual Tour contains information in the form of how to use the application, location plan, navigation buttons and panorama list. In the virtual tour there is also narration in the form of sound to provide descriptions and information about the active panorama. In each panorama there is a hotspot button for the user to move from one point to another[25].

2.5 Testing

The quality of software needs to be maintained, where quality depends on customer satisfaction[26]. The testing phase is carried out after the application has been created. Application testing in research consists of 3 aspects, namely Compatibility Testing, Usability Testing, Portability Testing, Compatibility Testing aims to measure the extent to which a product is compatible with other products in an environment. Usability testing aims to determine the extent to which a product or system can be used by certain users to achieve certain goals effectively, efficiently and satisfactorily in a certain context[27][28]. Portability testing is testing an application so that it can be accessed using different browsers, from desktop browsers to mobile browsers. Portability testing is carried out by running the website application in several desktop and mobile-based browsers. Testing focuses on the interface produced on the website page.

2.6 Distribution

At this stage the application that has been completed is then published as an HTML5 file which will be inserted into the website so that users can access the virtual tour application with the 3D maps feature using an internet connection[29][30].

3 Results and Discussions

3.1 Assembly results

Based on the design that has already been created, work will be done using several methods, such as creating a panorama image using the H5P tool and creating an HTML website to create an application that can display

a panorama image and provide information on pariwisata.

The results of the creation process based on the analysis of the virtual tour application are in line with the analysis that was conducted. This application allows users to view current weather conditions at eight locations for outdoor swimming pools that are created using 360-degree photography techniques, allowing for interactive visual information to be displayed. The photos that are generated by this application can be rotated in accordance with the user's preferences. Additionally, there is a deskripsi of the location providing information on the location for users of the virtual tour application.

3.1.1 Interface Display

An interface is a display that allows people to communicate with an application. The homepage, virtual tour, facilities, and news are all part of the interface.
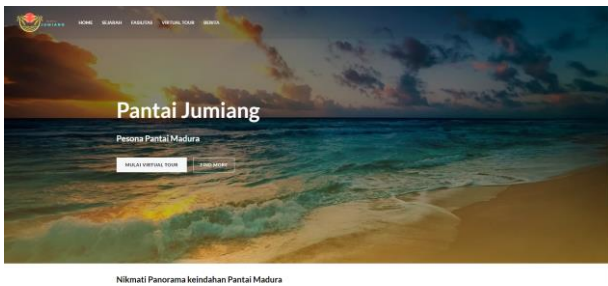

Fig. 4. Home page.

When the user opens the application, they are greeted with the home page in the home interface seen in Fig. 4. Users can interact with images of Jumiang Beach tourism on the main page. To initiate a virtual tour, users just only click on the single button located on the homepage.

Fig. 5. Virtual tour page.

Fig. 5: The display for the virtual tour. After selecting the "Start Virtual Tour" button, users are taken to the Virtual Tour page. Users can interact with this page by rotating the image to view it in 360 degrees. Additionally, there is a button on this page that takes users back to the previous page, where they can repeat the action using the device navigation button and the back button. On the virtual tour, users can navigate by

clicking on locations that have navigation buttons. Users can click on the navigation that takes them back to the previous location even after they have moved.
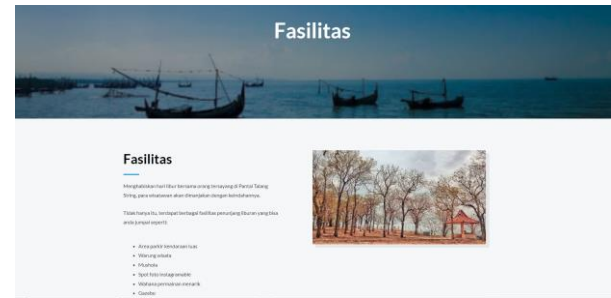

Fig. 6. Facilities page.

The facilities page is depicted in Fig. 6, where visitors can view a list of amenities offered by Jumiang Beach Tourism. In order to enhance user interest based on the facilities required for the tour, this page lets users know what facilities are available.
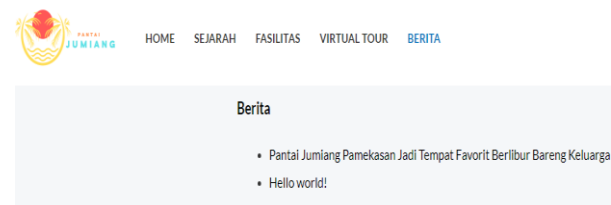

Fig. 7. News page.

A list of news items regarding Jumiang beach tourism can be found on the news page, as depicted in Fig. 7. The news feature lets users know if Jumiang Beach is being fixed. A title and a brief description accompany the list of news items that are shown. A user will be taken to the page where the targeted news is posted when they click on the title.

3.2 System testing using blackbox

The black box method of system testing involves accessing the system through an internet network and testing it with a web browser. With the Google Chrome browser, the test display looks like the one in Fig. 8.

Fig. 8. Pengujian page.

To ascertain whether the application's results match expectations, such as those shown in Table 1.

Table 1. Blackbox testing results.

No	Feature	Expected results	Results
1	Preview the Virtual Tour	The system can capture commands from the user to display a preview	Succeed
2	Running a Virtual Tour	The system can capture commands from the user to display the Virtual Tour and adjust user interactions	Succeed
3	Switch Virtual Tour locations	The system can change the appearance of places on the Virtual Tour according to the location desired by the user	Succeed
4	View the list of facilities	The system can capture commands from the user to display a list of facilities to the user interface	Succeed
5	View the news list	The system can capture commands from the user to display a list of news to the user interface	Succeed

3.3 Discussion results

In this research, it is explained that the results presented are a virtual tour system that has been tested using the black box method with the results of the 5 features being successful as expected.

4 Conclusion

The Jumiang Beach Natural Tourism Potential virtual tour application using 360-degree video technology is being developed using the Multimedia Development Life Cycle (MDLC) method. The application of 360-degree video technology into a virtual tour has been successfully carried out using a 360-degree camera and website-based developer software, resulting in a virtual tour application for the natural tourism potential of Jumiang Madura Beach. This application can be an alternative media for a different introduction to the tourism potential of Jumiang Beach, Madura and give application users a more real experience as if they had been at that location. Based on the test results, there are 5 features that have been declared successful. Henceforth, it can be used as a tool to increase the number of tourism visitors.

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