VISUALIZATION OF 360 DEGREE PANORAMIC FOR WEB-BASED DOCUMENTATION OF HISTORICAL OBJECTS TO SUPPORT TOURISM IN NEW NORMAL CONDITIONS

A.Muhammad Syafar[1*], Muhammad Agung[2], Widya Wisanty[3], Haswah[4]

[1]*Informatic Engineering, Alauddin State Islamic University of Makassar, Indonesia*
[2]*Mechanical Engineering, State University of Makassar, Indonesia*
3.Electrical Engineering, SawerigadingUniversity of Makassar, Indonesia
4.SMK Negeri 1 Bone, Indonesia
[1]*andi.syafar@uin-alauddin.ac.id,* [2]*agung@unm.ac.id*, [3]wwisanty@yahoo.co.id, [4]haswahm.pd@gmail.com

[*]*Corresponding author Email : andi.syafar@uin-alauddin.ac.id*

ABSTRACT

Tourism is one of the aspects of producing foreign exchange from the non-oil and gas economic sector for tourist attractions. One of them is documenting cultural heritage as a form of archaeological preservation. Therefore, to detect artifacts, ecofacs, monuments, or wall reliefs, adequate and complete data collection in the form of spatial or three-dimensional (3D) attributes is required. Therefore, as a form of cultural heritage preservation, a system is needed that is able to document antiquities with 3D (three-dimensional) modeling, using a panoramic photography approach to interactive visualization to provide information about archaeology, and as a medium for interactive learning. Create a space to use the virtual panorama for the preservation of historical sites. This research uses a qualitative research methodology of Design and Create, and the test carried out is black box testing which is focused on the functional needs of the software. The result of this study is an archaeological 3D document application with web-based 360-degree panoramic visualization. The advantage of this system is that it makes information more accessible to the public and becomes an interactive medium for identifying historical objects. So that users can experience exploring and appreciating ancient objects in detail from all sides.

Keywords : Archaeology, 3D (Three Dimensional), Virtual Panoramic, Web, Tourism

1. INTRODUCTION

Indonesia is a country with cultural wealth because of the many tribes and cultures that are part of the unity of the nation. The wealth can be seen in the archaeological sites that protect 4,444 cultural relics of the past. The sites are resources containing stone tools, bone tools, wood, sculptures, pottery, inscriptions, caves, architecture, and other objects that were the result of human activities in the past. Archaeological sites are an important component in reconstructing the culture of the past, so a reasonable effort must be made to preserve historical history. One of them is the documentation of cultural heritage as a form of archaeological relics.

VR is a technology designed to allow users to interact with environments derived from computer simulations in cyberspace, giving users of this technology a sense of being in that environment. Its development in the world of photography offers what is known as VRP (Virtual Reality Photography). VRP is a technology used to take wide-angle photos interactively. The problem for the tourism industry is that the format of presenting information is presented only in the form of text and images and does not touch the field of virtual reality. This technology can be used as a medium to advertise tourist attractions, education, public facilities, etc. This study aims to conduct a literature review and fill in the gaps in the literature review for the presentation of information on the website.

Conservation has the meaning of an action to protect against harm or damage, maintain or treat something from interference, destruction, or wear and tear. In addition, conservation according to archaeology is an effort to preserve archaeological objects to prevent or overcome the problem of damage or weathering, in order to prolong their life. (Samidi, 1996)

Preservation efforts can be in the form of preservation and improvement into concrete actions in the care of historical objects that hold many stories of human life in the past. Historical objects, especially those in the form of structures such as artifacts, ecofacs and monuments, are easily eroded by weather such as wind and rain or natural activities such as earthquakes, floods and storms that cause degradation and deformation of structures and surfaces. Archaeological relics whose condition has been severely damaged cannot be easily restored. In addition, many archaeological objects are still authentic, so a massive restoration can be done but cannot restore the details that have been lost. So it is necessary to record good and complete data in the form of spatial or 3-dimensional attributes for recording an artifact, ecofac, monument or wall relief and others.

Data recording in archaeology is a requirement for completeness in reconstructing historical objects that hold many stories of human life in the past. The remains of

historical relics such as artifacts, ecofacs, monuments and others hold cultural and historical values that can ostensibly lead us to a civilization in the past. However, the historical relics that have received less attention from the general public, this can be seen in the lack of interest in visiting the museum.

Referring to the existing conditions it can be concluded that the lack of good recording qualities of archaeological objects and the lack of interest in archaeological objects. Therefore, it is necessary to create a system that can document 3D modeling archaeological objects, as a form of cultural heritage preservation and become a medium for information and interactive learning about archaeology.

This 3D modeling technology has been applied in archaeological research such as the reconstruction of artifacts and the virtual reproduction of a historical site. In addition, there are several materials that have been made with the same method such as stone, bone, to ceramics. However, the existence of a panoramic photography approach for interactive visualization opens up a space for the use of Virtual Panoramics in the preservation of historical sites

The reconstruction of the historical relics using photogrammetry techniques and 3D models are then displayed using 360 Degree Panoramic visualizations. With the archaeological documentation system using 360 Degree Panoramic visualization, it makes it easier for the public to access historical information. So that with the above features users can feel the experience of exploration and appreciate an archaeological object in detail from all sides.

Virtual reality photography is an interactive visual creation, especially in the form of panoramas and video objects. A panorama is an image that displays a wide angle of view. (Highton, 2010). Virtual Reality Photograhy basically provides a 360-degree view and presents the scene in a spherical view, as if the user is in the image or location captured by the photographer. The resulting image can be given an effect using a computer, the final result can be called VR Panorama. VR Panorama can be viewed using an interactive user interface application. The result can be clicked and rotated horizontally or vertically as if the user is in the view of the actual environment. VR Panorama is currently developing rapidly and has become a popular visual technology, because VR Panorama can provide a new experience for users by displaying different points of view in viewing panoramic photos, VR Panorama can give users an interactive state.

Website is an internet facility that connects documents in the local and remote scope. Documents on the website are called web pages and links on the website allow users to move from one page to another (hyper text), both between pages stored on the same server and servers around the world. Pages are accessed and read through browsers such as Netscape Navigator, Internet Explorer, Mozila Firefox, Google Chrome and other browser applications. (Judge, 2004)

PHP is a webserver-side programming language that is open source. PHP is a script that is integrated into HTML and is located on a server (Server Side HTML Embedded Scripting). PHP is a script used to create dynamic website pages. Dynamic means that the page to be displayed is created when the page is requested by the client. This mechanism causes the information received by the client to always be up to date. All PHP scripts are executed on the server where they are run. (Anhar, 2010)

This research focused on virtual reality applications. This application is used as a medium for Archaeological Documentation at the Makassar Archaeological Center. The scope of visualization is in the form of artifacts and ecofacs in the Makassar Archaeological Center. Shooting archaeological objects using photogrammetry and object reconstruction techniques to produce a photorealistic 3-dimensional model. The app uses a panoramic photography approach and image stitching techniques for interactive, web-based visualization. This system provides information to the general public regarding archaeological objects.

The system is web-based that documents archaeological objects using a 360-degree ponaramic view displayed horizontally. Shooting using photogrammetry techniques and reconstruction of 3D models of archaeological objects displayed using 360 panoramic visualization with image stitching techniques.

II.VI RTUAL TOUR OBJECT DESIGN

1) Panoramic Design

The interface of the 360 Makassar Archaeological Center is designed using Kolor Panotour Pro 2.5 Software to create several features and connect the panorama with each other.

Figure 1. Panoramic Design

2) System Implementation

a). Interface Home

Figure 2. Interface Home

b) Interface Virtual Tour

Figure 3. Interface Virtual Tour

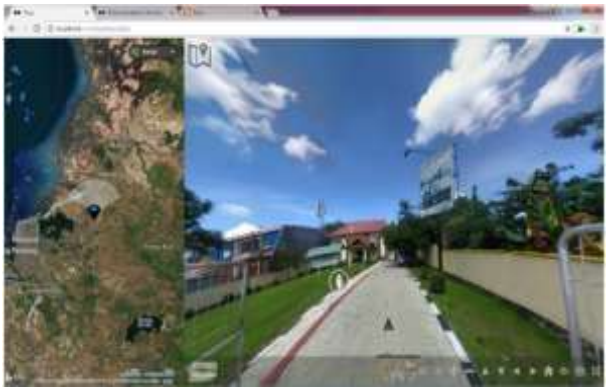

Figure 4. Interface Peta

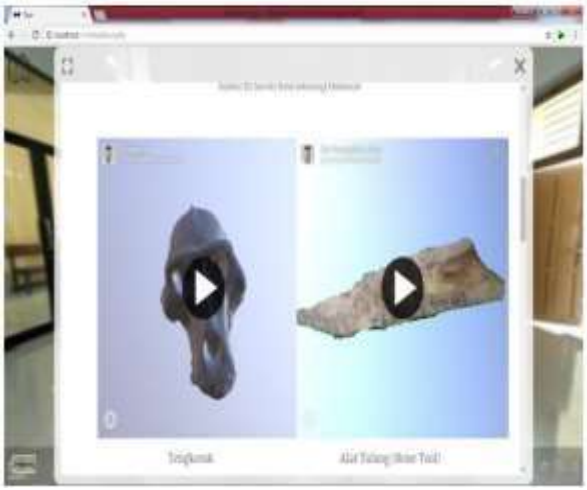

Figure 5. Object Archeology

III. CONCLUSION

This application can make it easier for the public to access historical information using Virtual Tour technology, so that with the above features users can feel the experience of exploring and appreciating an archaeological object in detail from all sides. The application of the photogrammetry method to the reconstruction of archaeological objects using a 360-degree ponaramic visualization displayed horizontally

REFERENCES

Anhar, S. Panduan Menguasai PHP & MySQL Secara Otodidak. Jakarta: Media Kit, 2010.

Bhasin, Harsh, dik."Black Box Testing based on Requirement Analysis and Design Specifications". International Journal of Computer Applications, vol. 87 no.18 (Diakses 18 November 2016).

Samidi. Perkembangan Konservasi Arkeologi di Indonesia. Jakarta: Pusat Penelitian Arkeologi Nasional, 1996.

Highton, Scott. Virtual Reality Photography: Creating Panoramic and Object Images. San Carlos, CA : Virtual Reality Photography, 2010

Wolf, P. R. Element of Photogrammetry, New York: McGraw-Hill, 1993.

Xiao J, Hays J, Ehinger, Olivia, dan Torralba. Recognizing Scene Viewpoint using Panoramic Place Representation. Massachusetts Institute of Technology, 2012

Cyganek, Boguslaw dan Siebert JP. An Introduction to 3D Computer Vision Techniques and Algorithms.Wiltshire(UK): John Wiley & Sons, Ltd, 2009.